UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT UNDER SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended September 30, 2024

☐ **TRANSITION REPORT UNDER SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to

Commission file number 001-38042

ARROWHEAD PHARMACEUTICALS, INC.

(Exact name of registrant as specified in its charter)

Delaware	**46-0408024**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

(626) 304-3400
177 E. Colorado Blvd, Suite 700
Pasadena, California 91105
(Address and telephone number of principal executive offices)

Securities registered pursuant to Section 12(b) of the Exchange Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, $0.001 par value	**ARWR**	**The Nasdaq Global Select Market**

Securities registered pursuant to Section 12(g) of the Exchange Act: None

Indicate by a check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by a check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☒	Accelerated filer	☐	Non-accelerated filer	☐	Smaller reporting company	☐
Emerging growth company	☐						

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

The aggregate market value of issuer's voting and non-voting outstanding common stock held by non-affiliates was approximately $3.0 billion based upon the closing stock price of issuer's common stock on March 31, 2024. Shares of common stock held by each officer and director and by each person who is known to own 10% or more of the outstanding common stock have been excluded in that such persons may be deemed to be affiliates of the Company. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of November 20, 2024, 124,434,442 shares of the issuer's Common Stock were issued and outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Definitive Proxy Statement to be filed for Arrowhead Pharmaceuticals, Inc.'s 2025 Annual Meeting of Stockholders are incorporated by reference into Part III hereof.

PART I

PART II

PART III

PART IV

FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended, and we intend that such forward-looking statements be subject to the safe harbors created thereby. For this purpose, any statements contained in this Annual Report on Form 10-K except for historical information may be deemed to be forward-looking statements. Without limiting the generality of the foregoing, words such as "may," "might," "will," "expect," "believe," "anticipate," "goal," "endeavor," "strive," "intend," "plan," "project," "could," "estimate," "target," "might," "forecast," or "continue" or the negative of these words or other variations thereof or comparable terminology are intended to identify forward-looking statements. In addition, any statements that refer to projections of our future financial performance, trends in our business, or other characterizations of future events or circumstances are forward-looking statements. These forward-looking statements include, but are not limited to, statements about the initiation, timing, progress and results of our preclinical studies and clinical trials, and our research and development programs; our expectations regarding regulatory approval for and commercial launch of plozasiran our expectations regarding the potential benefits of the partnership, licensing and/or collaboration arrangements and other strategic arrangements and transactions we have entered into or may enter into in the future; our beliefs and expectations regarding the amount and timing of future milestone, royalty or other payments that could be due to or from third parties under existing agreements; and our estimates regarding future revenues, research and development expenses, capital requirements and payments to third parties.

The forward-looking statements included herein are based on current expectations of our management based on available information and involve a number of risks and uncertainties, all of which are difficult or impossible to predict accurately, and many of which are beyond our control. As such, our actual results and timing of certain events may differ materially from the results discussed, projected, anticipated or indicated in any forward-looking statements. Forward-looking statements are not guarantees of future performance and our actual results of operations, financial condition and cash flows may differ materially. Factors that may cause or contribute to such differences include, but are not limited to, those discussed in more detail in "Item 1. Business" and "Item 1A. Risk Factors" of Part I and "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" of Part II of this Annual Report on Form 10-K. Readers should carefully review these risks, as well as the additional risks described in other documents we file from time to time with the Securities and Exchange Commission (the "SEC"). In light of the significant risks and uncertainties inherent in the forward-looking information included herein, the inclusion of such information should not be regarded as a representation by us or any other person that such results will be achieved, and readers are cautioned not to place undue reliance on such forward-looking information. Statements made herein are as of the date of the filing of this Annual Report on Form 10-K with the SEC and should not be relied upon as of any subsequent date. Except as may be required by law, we disclaim any intent to revise the forward-looking statements contained herein to reflect events or circumstances after the date hereof or to reflect the occurrence of unanticipated events.

PART I

Unless otherwise noted, (1) the term "Arrowhead" refers to Arrowhead Pharmaceuticals, Inc., a Delaware corporation and its Subsidiaries, (2) the terms "Company," "we," "us," and "our," refer to the ongoing business operations of Arrowhead and its Subsidiaries, whether conducted through Arrowhead or a subsidiary of Arrowhead, (3) the term "Subsidiaries" refers to Arrowhead Madison Inc. ("Arrowhead Madison"), Arrowhead Australia Pty Ltd ("Arrowhead Australia"), and Visirna Therapeutics Inc. ("Visirna") (4) the term "common stock" refers to Arrowhead's common stock, (5) the term "preferred stock" refers to Arrowhead's preferred stock and (6) the term "stockholder(s)" refers to the holders of Arrowhead common stock.

ITEM 1. BUSINESS

A. Overview

The Company develops medicines that treat intractable diseases by silencing the genes that cause them. Using a broad portfolio of RNA chemistries and efficient modes of delivery, the Company's therapies trigger the RNA interference mechanism to induce rapid, deep and durable knockdown of target genes.

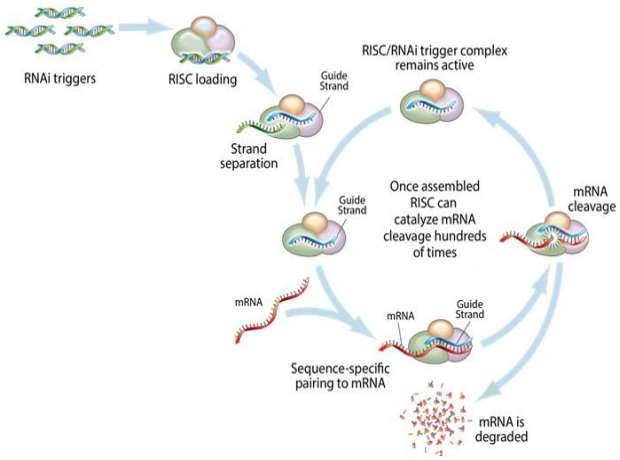
The Company's most advanced candidate, plozasiran, has completed a Phase 3 study in patients with familial chylomicronemia syndrome (FCS) and expects to have its first commercial launch in 2025, provided the United States Food and Drug Administration (the "FDA") accepts the New Drug Application ("NDA") for filing and after a successful review and subsequent approval. The Company's pipeline of 16 clinical stage investigational medicines range in development stage from Phase 1 to Phase 3. In addition, the Company has a robust discovery stage pipeline which is capable of generating multiple new clinical candidates each year.

The Company endeavors to serve unmet medical needs and change lives leveraging the versatility of its proprietary RNAi-based technology. The Company is acutely aware of the urgent need to develop solutions for the many diseases that have genetic targets that are otherwise undruggable by small molecules or biologics. To that end, the Company embraced its bold goal and strives to have 20 individual drugs, either partnered or wholly owned, in clinical trials or on the market in 2025.

RNA Interference and the Benefits of RNAi Therapeutics

RNA interference ("RNAi") is a mechanism present in living cells that inhibits the expression of a specific gene, thereby affecting the production of a specific protein. RNAi-based therapeutics may leverage this natural pathway of gene silencing to target and shut down specific disease-causing genes.

Small molecule and antibody drugs have proven effective at inhibiting certain cell surface, intracellular, and extracellular targets. However, other drug targets have proven difficult to inhibit with traditional drug-based and biologic therapeutics. Developing effective drugs for these targets would have the potential to address large underserved markets for the treatment of many diseases. Using the ability to specifically silence any gene, RNAi therapeutics may be able to address previously "undruggable" targets, unlocking the market potential of such targets.



This figure depicts the mechanism by which gene silencing occurs. Double stranded RNAi triggers are introduced into a cell and are loaded into the RNA-induced silencing complex ("RISC"). The strands are then separated, leaving an active RISC/RNAi trigger complex. This complex can then pair with and degrade the complementary messenger RNAs ("mRNA") and stop the production of the target proteins. RNAi is a catalytic process, so each RNAi trigger can degrade mRNA hundreds of times, which results in a relatively long duration of effect for RNAi therapeutics.

Key Benefits of RNAi as a Therapeutic Modality:

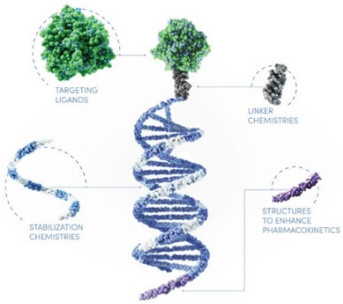
- Silences the expression of disease associated genes;
- Potential to address any target in the transcriptome including previously "undruggable" targets;
- Rapid lead identification;
- High specificity;
- Opportunity to use multiple RNA sequences in one drug product for synergistic silencing of related targets; and
- RNAi therapeutics are uniquely suited for personalized medicine through target and cell specific delivery and gene knockdown.

Targeted RNAi Molecule (TRiM™) Platform

The Company's Targeted RNAi Molecule (TRiM™) platform utilizes ligand-mediated delivery and is designed to enable tissue-specific targeting while being structurally simple. Targeting has been core to the Company's development philosophy and the TRiM™ platform builds on more than a decade of work on actively targeted drug delivery vehicles. The Company's scientists have discovered ways to progressively "TRiM" away extraneous features and chemistries and retain optimal pharmacologic activity.

The TRiM™ platform is comprised of a highly potent RNA trigger identified using the Company's proprietary trigger selection rules and algorithms with the following components optimized, as needed, for each drug candidate: a high affinity targeting ligand; various linker chemistries; structures that enhance pharmacokinetics; and highly potent RNAi triggers with sequence specific stabilization chemistries.

Therapeutics developed with the TRiM™ platform offer several advantages: simplified manufacturing and reduced costs; multiple routes of administration; and potential for improved safety because there are less metabolites from smaller molecules, thereby reducing the risk of intracellular buildup. The Company also believes that for RNAi to reach its true potential, it must target organs outside the liver. The Company is leading this expansion with the TRiM™ platform, which has shown the potential to reach multiple tissues, including liver, lung, central nervous system (CNS), muscle, and adipose tissue.



TRiM™ – *Targeting the gene, to Silence the disease*

- ***Activity*** characterized by depth & duration of effect
  - Ability to unlock previously undruggable targets
- ***Specificity*** to maximize activity and innate stability with the potential for reduced off-target effects
- ***Versatility*** in formulation & ligand design offers multiple routes of administration, and access to multiple tissues
  - Facilitates rapid drug development and speed to patients
- ***Simplicity*** in design translates to relatively lower costs, and production at scale

RNA Chemistries

The structure and chemistries of the oligonucleotide molecules used to trigger the RNAi mechanism can be tailored for optimal activity. The Company's broad portfolio of RNA trigger structures and chemistries, including some proprietary structures, enable the Company to optimize each drug candidate on a target-by-target basis and utilize the combination of structure and chemical modifications that yield the most potent RNAi trigger.

As a component of the TRiM™ platform, the Company's design philosophy for RNA chemical modifications is to start with a structurally simple molecule and add only selective modification and stabilization chemistries as necessary to achieve the desired level of target knockdown and duration of effect. The conceptual framework for the stabilization strategy starts with a more sophisticated RNAi trigger screening and selection process that identifies potent sequences rapidly in locations that others may miss.

B. Pipeline

The Company is focused on developing innovative drugs for diseases with a genetic basis, typically characterized by the overproduction of one or more proteins that are involved with disease. The depth and versatility of the Company's RNAi technologies enables the Company to potentially address conditions in virtually any therapeutic area and pursue disease targets that are not otherwise addressable by small molecules and biologics. The Company is focused on bringing the promise of RNAi to address diseases outside of the liver, and its pipeline now includes disease targets in the liver, lung, central nervous system (CNS), muscle and adipose tissue.

Plozasiran (ARO-APOC3)

Plozasiran (formerly ARO-APOC3) is designed to reduce production of Apolipoprotein C-III (apoC-III), a component of triglyceride rich lipoproteins (TRLs) including Very Low Density Lipoprotein (VLDL) and chylomicrons, a key regulator of triglyceride metabolism. The Company believes that knocking down the hepatic production of apoC-III may result in reduced VLDL synthesis and assembly, enhanced breakdown of TRLs, and better clearance of VLDL and chylomicron remnants. The Company is currently investigating plozasiran in one Phase 2 clinical trial and four Phase 3 clinical trials. In the Phase 3 PALISADE trial in patients with familial chylomicronemia syndrome (FCS), plozasiran has met its primary endpoint of triglyceride reduction as well as all of its key (alpha controlled) secondary endpoints. The Company is currently in the process of seeking regulatory approval for plozasiran for the treatment of FCS.

Hypertriglyceridemia: Elevated triglyceride levels are an independent risk factor for cardiovascular disease. Severely elevated triglycerides in patients with severe hypertriglyceridemia (SHTG) or familial chylomicronemia syndrome (FCS), a rare genetic disorder, can result in potentially fatal acute pancreatitis.

Study Name: Study of ARO-APOC3 in Adults With Dyslipidemia
A Phase 2 Open-Label Extension Study to Evaluate the Long-Term Safety and Efficacy of ARO-APOC3 in Adults With Dyslipidemia
ClinicalTrials.gov Identifier: NCT05413135

Study Name: Study of ARO-APOC3 in Adults With FCS (PALISADE)
A Phase 3 Study to Evaluate the Efficacy and Safety of ARO-APOC3 in Adults With Familial Chylomicronemia Syndrome
ClinicalTrials.gov Identifier: NCT05089084

Study Name: Study of Plozasiran (ARO-APOC3) in Adults With Severe Hypertriglyceridemia (SHASTA-3)
Double-blind, Placebo-controlled, Phase 3 Study to Evaluate the Efficacy and Safety of Plozasiran in Adults With Severe Hypertriglyceridemia
ClinicalTrials.gov Identifier: NCT06347003

Study Name: Study of Plozasiran in Adults With Severe Hypertriglyceridemia (SHASTA-4)
Double-blind, Placebo-controlled, Phase 3 Study to Evaluate the Efficacy and Safety of Plozsiran in Adults With Severe Hypertriglyceridemia
ClinicalTrials.gov Identifier: NCT06347016

Study Name: Phase 3 Study of Plozasiran in Adults With Hypertriglyceridemia (MUIR-3)
Double-blind, Placebo-controlled, Phase 3 Study to Evaluate the Efficacy and Safety of Plozasiran in Adults With Hypertriglyceridemia
ClinicalTrials.gov Identifier: NCT06347133

Zodasiran (ARO-ANG3)

Zodasiran (formerly ARO-ANG3) is designed to reduce production of angiopoietin-like protein 3 (ANGPTL3), a liver synthesized inhibitor of lipoprotein lipase and endothelial lipase. ANGPTL3 inhibition has been shown to lower serum LDL, serum and liver triglyceride and has genetic validation as a novel target for cardiovascular disease. The Company is currently investigating zodasiran in two Phase 2b clinical trials.

Dyslipidemia and Hypertriglyceridemia: Dyslipidemia and hypertriglyceridemia are risk factors for atherosclerotic coronary heart disease and cardiovascular events.

Study Name: Study of ARO-ANG3 in Adults With Mixed Dyslipidemia (ARCHES-2)
A Double-blind, Placebo-controlled Phase 2b Study to Evaluate the Efficacy and Safety of ARO-ANG3 in Adults With Mixed Dyslipidemia
ClinicalTrials.gov Identifier: NCT04832971

Study Name: Study of ARO-ANG3 in Participants With Homozygous Familial Hypercholesterolemia (HoFH) (GATEWAY)
Phase 2 Study to Evaluate the Safety and Efficacy of ARO-ANG3 in Subjects with Homozygous Familial Hypercholesterolemia (HoFH)
ClinicalTrials.gov Identifier: NCT05217667

ARO-PNPLA3

ARO-PNPLA3 (formerly JNJ-75220795) is an investigational RNAi therapeutic designed to reduce liver expression of patatin-like phospholipase domain containing 3 (PNPLA3) as a potential treatment for patients with metabolic-dysfunction associated steatohepatitis (MASH). PNPLA3 has strong genetic and preclinical validation as a driver of fat accumulation and damage in the livers of patients who carry the common I148M mutation. Former licensee Janssen Pharmaceuticals, Inc. investigated ARO-PNPLA3 in two Phase 1 clinical trials.

MASH: MASH is a subgroup of steatotic liver disease (MASLD) in which hepatic cell injury and inflammation has developed over background steatosis. The I148M genetic variant in the PNPLA3 gene is involved with the underlying pathophysiology and is a known risk factor for hepatic steatosis, steatohepatitis, elevated plasma liver enzyme levels, hepatic fibrosis and cirrhosis. The rising prevalence of MASH presents a significant health burden in many developed countries.

ARO-INHBE

ARO-INHBE is designed to reduce the hepatic expression of the INHBE gene and its secreted gene product, Activin E. INHBE is a promising genetically validated target in which loss-of-function INHBE variants in humans are associated with lower risk of obesity and metabolic diseases, such as type 2 diabetes. The Company has filed for regulatory clearance to initiate a Phase 1/2a clinical trial of ARO-INHBE.

ARO-RAGE

ARO-RAGE is designed to reduce production of the Receptor for Advanced Glycation End products (RAGE) as a potential treatment for various inflammatory pulmonary diseases. The Company is currently investigating ARO-RAGE in a Phase 1/2a clinical trial.

Study Name: Study of ARO-RAGE in Healthy Subjects and Patients With Inflammatory Lung Disease
A Phase 1/2a Study Evaluating the Effects of ARO-RAGE in Healthy Subjects and Patients With Inflammatory Lung Disease
ClinicalTrials.gov Identifier: NCT05276570

ARO-MUC5AC

ARO-MUC5AC is designed to reduce production of mucin 5AC (MUC5AC) as a potential treatment for various muco-obstructive pulmonary diseases. The Company is currently investigating ARO-MUC5AC in a phase 1/2a clinical trial.

Study Name: Study of ARO-MUC5AC in Healthy Subjects and Patients With Muco-Obstructive Lung Disease
A Phase 1/2a Study to Evaluate the Effects of ARO-MUC5AC in Healthy Subjects and Patients with Muco-Obstructive Lung Disease
ClinicalTrials.gov Identifier: NCT05292950

ARO-MMP7

ARO-MMP7 is designed to reduce expression of matrix metalloproteinase 7 (MMP7) as a potential treatment for Idiopathic Pulmonary Fibrosis (IPF). The Company is currently investigating ARO-MMP7 in a Phase 1/2a clinical trial.

Study Name: Study of ARO-MMP7 Inhalation Solution in Healthy Subjects and Patients With Idiopathic Pulmonary Fibrosis
A Phase 1/2a Study Evaluating the Effects of ARO-MMP7 Inhalation Solution in Healthy Subjects and Patients With Idiopathic Pulmonary Fibrosis
ClinicalTrials.gov Identifier: NCT05537025

ARO-DUX4

ARO-DUX4 is designed to target the gene that encodes human double homeobox 4 (DUX4) protein as a potential treatment for patients with facioscapulohumeral muscular dystrophy.

Facioscapulohumeral Muscular Dystrophy: Facioscapulohumeral muscular dystrophy (FSHD) is an autosomal dominant disease associated with the failure to maintain complete epigenetic suppression of DUX4 expression in differentiated skeletal muscle, leading to overexpression of DUX4, which is myotoxic and can lead to muscle degeneration. As DUX4 expression is recognized as the cause of muscle pathology in FSHD patients, the Company believes that the selective targeting and knockdown of DUX4 using RNAi may prevent or reverse downstream myotoxicity and lead to muscle repair and improvement in muscle function in patients. There are currently no effective treatments specifically for FSHD.

Study Name: Study of ARO-DUX4 in Adult Patients With Facioscapulohumeral Muscular Dystrophy Type 1
A Phase1/2a Dose-Escalating Study to Evaluate the Safety, Tolerability, Pharmacokinetics, and Pharmacodynamics of ARO-DUX4 in Adult Patients With Facioscapulohumeral Muscular Dystrophy Type 1.
ClinicalTrials.gov Identifier: NCT06131983

ARO-DM1

ARO-DM1 is designed to reduce expression of the dystrophia myotonica protein kinase (DMPK) gene. There is currently no approved disease-modifying therapy for type 1 myotonic dystrophy (DM1). Treatments have focused on symptomatic management, including physical therapy, exercise, ankle-foot orthoses, wheelchairs, and other assistive devices. The Company is currently investigating ARO-DM1 in a Phase 1/2a clinical trial.

Type 1 Myotonic Dystrophy: Type 1 myotonic dystrophy is an autosomal dominant, debilitating, chronic progressive multisystem disorder characterized by an expansion of a highly unstable CUG^{exp} in the DMPK gene. Patients with DM1 have muscle weakness and wasting, myotonia, cataracts, and often have cardiac conduction abnormalities, and may become physically disabled and have a shortened life span.

Study Name: Study of ARO-DM1 in Subjects With Type 1 Myotonic Dystrophy
A Phase 1/2a Dose-Escalating Study to Evaluate the Safety, Tolerability, Pharmacokinetics, and Pharmacodynamics of ARO-DM1 in Subjects With Type 1 Myotonic Dystrophy Who Are ≥18 to ≤ 65 Years
ClinicalTrials.gov Identifier: NCT06138743

ARO-ATXN2

ARO-ATXN2 is designed to reduce the expression of the ATXN2 gene as a potential treatment for spinocerebellar ataxia 2 (SCA2). SCA2 is a progressive cerebellar ataxia with instability of stance, speech and swallow disorder, pain, spasticity, and ocular signs, caused by gain of function of mutant expanded polyQ ATXN2 protein. The Company is currently investigating ARO-ATXN2 in a Phase 1 clinical trial.

Study Name: Study of ARO-ATXN2 Injection in Adults With Spinocerebellar Ataxia Type 2
A Phase 1 Placebo-Controlled Dose Escalating Study to Evaluate the Safety, Tolerability, Pharmacokinetics, and Pharmacodynamics of ARO-ATXN2 in Adult Subjects With Spinocerebellar Ataxia Type 2
ClinicalTrials.gov Identifier: NCT06672445

ARO-C3

ARO-C3 is designed to reduce production of complement component 3 (C3) as a potential therapy for patients with various complement mediated or complement associated renal diseases. The Company is currently investigating ARO-C3 in a Phase 1/2a clinical trial.

Complement-Mediated Renal Disease: A number of rare renal diseases result from uncontrolled activation of the alternative pathway of complement, leading to progressive glomerular damage, proteinuria, hematuria, and impaired kidney function, and often resulting in end-stage renal disease (ESRD). In addition, dysregulation of the alternative

complement pathway has been shown to play a role in the pathogenesis and progression of disease in some of the more common glomerulopathies. Silencing C3 may be a therapeutic approach for treatment of these conditions.

Study Name: Study of ARO-C3 in Adult Healthy Volunteers and Patients With Complement-Mediated Renal Disease
A Phase 1/2a Dose-Escalating Study to Evaluate the Safety, Tolerability, Pharmacokinetics, and/or Pharmacodynamics of ARO-C3 in Adult Healthy Volunteers and in Adult Patients With Complement-Mediated Renal Disease
ClinicalTrials.gov Identifier: NCT05083364

ARO-CFB

ARO-CFB is designed to reduce hepatic expression of complement factor B (CFB), which plays an important regulatory role in amplifying complement alternative pathway activation and has been identified as a promising therapeutic target. ARO-CFB is being developed as a potential treatment for complement mediated kidney diseases such as immunoglobulin A nephropathy (IgAN), which is the most common glomerular disease worldwide and carries a high lifetime risk of progression to end-stage renal disease. Additionally, ARO-CFB may have clinical applications in non-renal diseases involving complement activation. The Company is currently investigating ARO-CFB in a Phase 1/2a clinical trial.

Complement-Mediated Disease: A number of rare renal diseases result from uncontrolled activation of the alternative pathway of complement, leading to progressive glomerular damage, proteinuria, hematuria, and impaired kidney function, and often resulting in end-stage renal disease (ESRD). In addition, dysregulation of the alternative complement pathway has been shown to play a role in the pathogenesis and progression of disease in some of the more common glomerulopathies. Silencing CFB may be a therapeutic approach for treatment of these conditions.

Study Name: Study of ARO-CFB in Adult Healthy Volunteers and Patients With Complement-Mediated Kidney Disease
A Phase 1/2a Dose-Escalating Study to Evaluate the Safety, Tolerability, Pharmacokinetics, and Pharmacodynamics of Single and Multiple Doses of ARO-CFB in Adult Healthy Volunteers and Adult Patients With Complement-Mediated Kidney Disease
ClinicalTrials.gov Identifier: NCT06209177

Collaboration and License Agreements

Glaxosmithkline Intellectual Property (No. 3) Limited ("GSK")

GSK-HSD License Agreement

On November 22, 2021, GSK and the Company entered into an Exclusive License Agreement (the "GSK-HSD License Agreement"). Under the GSK-HSD License Agreement, GSK has received an exclusive license for GSK-4532990 (formerly ARO-HSD). The exclusive license is worldwide with the exception of greater China. GSK is wholly responsible for all clinical development and commercialization of GSK-4532990 in its territory. GSK dosed the first patient in a Phase 2b trial in March 2023.

GSK-4532990

GSK-4532990 (formerly ARO-HSD) is designed to reduce production of HSD17B13, a hydroxysteroid dehydrogenase involved in the metabolism of hormones, fatty acids and bile acids. Published human genetic data indicate that a loss of function mutation in HSD17B13 provides strong protection against metabolic-dysfunction associated steatohepatitis (MASH) cirrhosis and alcoholic hepatitis and cirrhosis. GSK is conducting Phase 2b clinical trials in patients with MASH and alcohol-related liver disease (ALD).

Metabolic-Dysfunction Associated Steatohepatitis: MASH is liver inflammation and damage caused by a buildup of fat in the liver. This can cause scarring of the liver and in advanced cases can lead to cirrhosis. Alcochol-related liver disease (ALD) represents a spectrum of liver injury resulting from alcohol use, ranging from hepatic steatosis to more advances forms including alcoholic hepatitis (AH), alcohol-associated cirrhosis (AC), and acute AH presenting as acute-on-chronic liver failure.

Study Name: Phase 2b Study of GSK4532990 in Adults With MASH (HORIZON)
17 β-Hydroxysteroid Dehydrogenase Type 13 Minimization for the Treatment of MASH (HORIZON): A Double-Blind, Placebo-Controlled Phase 2b Study to Evaluate the Efficacy and Safety of GSK4532990 in Adults With Pre-Cirrhotic Metabolic-Dysfunction Associated Steatohepatitis
ClinicalTrials.gov Identifier: NCT05583344

GSK-HBV Agreement

On December 11, 2023, the Company entered into an Amended and Restated License Agreement with GSK (the "GSK-HBV Agreement") pursuant to which GSK received a worldwide, exclusive license to develop and commercialize daplusiran/tomligisiran (GSK5637608, formerly JNJ-3989), the Company's third-generation subcutaneously administered RNAi therapeutic candidate being developed as a potential therapy for patients with chronic hepatitis B virus infection. GSK5637608 had previously been licensed to Janssen Pharmaceuticals, Inc. ("Janssen") in October 2018. GSK is currently in the process of initiating a Phase 2 study of daplusiran/tomligisiran followed by bepirovirsen in patients with chronic hepatitis B.

Study Name: A Study of Sequential Therapy With Daplusiran/Tomligisiran (DAP/TOM) Followed by Bepirovirsen in Participants Living With Chronic Hepatitis B (CHB) (B-UNITED)
A Phase 2b, Multi-centre, Randomized, Partially Placebo-controlled, Double-blind Study to Investigate the Safety and Efficacy of Sequential Therapy With Daplusiran/Tomligisiran Followed by Bepirovirsen in Participants With Chronic Hepatitis B Virus on Background Nucleos(t)Ide Analogue Therapy (B-United)
ClinicalTrials.gov Identifier: NCT06537414

Takeda Pharmaceutical Company Limited ("Takeda")

On October 7, 2020, Takeda and the Company entered into an Exclusive License and Co-Funding Agreement (the "Takeda License Agreement"). Under the Takeda License Agreement, Takeda and the Company co-develop the Company's Fazirsiran program (formerly TAK-999 and ARO-AAT), the Company's second-generation subcutaneously administered RNAi therapeutic candidate being developed as a treatment for liver disease associated with alpha-1 antitrypsin deficiency. Within the United States, fazirsiran, if approved, will be co-commercialized under a 50/50 profit sharing structure. Outside the United States, Takeda received an exclusive license to commercialize fazirsiran and will lead the global commercialization strategy, while the Company will be eligible to receive tiered royalties of 20% to 25% on net sales.

Fazirsiran

Fazirsiran is a subcutaneously administered RNAi therapeutic being developed as a treatment for liver disease associated with alpha-1 antitrypsin deficiency (AATD), which is a rare genetic disorder that severely damages the liver and lungs of affected individuals. Fazirsiran is designed to reduce production of the mutant Z-AAT protein by silencing the AAT gene in order to prevent accumulation of Z-AAT in the liver, allow clearance of the accumulated Z-AAT protein, prevent repeated cycles of cellular damage, and possibly prevent or even reverse the progression of liver fibrosis.

Goal of Fazirsiran Treatment: The goal of Fazirsiran treatment is prevention and potential reversal of Z-AAT accumulation-related liver injury and fibrosis. Reduction of inflammatory Z-AAT protein, which has been clearly defined as the cause of progressive liver disease in AATD patients, is important as it is expected to halt the progression of liver disease and allow fibrotic tissue repair.

Alpha-1 Antitrypsin Deficiency (AATD): AATD is a genetic disorder associated with liver disease in children and adults, and pulmonary disease in adults. AAT is a circulating glycoprotein protease inhibitor that is primarily synthesized and secreted by liver hepatocytes. Its physiologic function is the inhibition of neutrophil protease to protect healthy lung tissues during inflammation and prevent tissue damage. The most common disease variant, the Z mutant, has a single amino acid substitution that results in improper folding of the protein. The mutant protein cannot be effectively secreted and accumulates in globules in the hepatocytes. This triggers continuous hepatocyte injury, leading to fibrosis, cirrhosis, and increased risk of hepatocellular carcinoma.

Current Treatments: Individuals with the homozygous PiZZ genotype have severe deficiency of functional AAT leading to pulmonary disease and hepatocyte injury and liver disease. Lung disease in this patient population is frequently treated with AAT augmentation therapy. However, augmentation therapy does nothing to treat liver disease, and there is no specific therapy for hepatic manifestations. There is a significant unmet need as liver transplant, with its attendant morbidity and mortality, is currently the only available treatment.

Clinical Trials:

Study Name: Study to Check the Safety of Fazirsiran and Learn if Fazirsiran Can Help People With Liver Disease and Scarring (Fibrosis) Due to an Abnormal Version of Alpha-1 Antitrypsin Protein (REDWOOD)
REDWOOD – A Randomized, Double-blind, Placebo-Controlled, Phase 3 Study to Evaluate the Efficacy and Safety of fazirsiran in the Treatment of Alpha-1 Antitrypsin Deficiency-Associated Liver Disease With METAVIR Stage F2 to F4 Fibrosis
ClinicalTrials.gov Identifier: NCT05677971

Study Name: An Extension Study to Learn About the Long-Term Safety of Fazirsiran and if Fazirsiran Can Help People With Alpha-1 Antitrypsin Liver Disease
A Phase 3, Open-Label Extension Study to Evaluate the Long-Term Safety and Efficacy of fazirsiran in Participants With Alpha-1 Antitrypsin Deficiency-Associated Liver Disease
ClinicalTrials.gov Identifier: NCT05899673

Study Name: Study to Learn About the Safety of Fazirsiran and if it Can Help People With Alpha-1 Antitrypsin Liver Disease With Mild Liver Scarring (Fibrosis)
A Randomized, Double-Blind, Placebo-Controlled, Phase 3 Study to Evaluate the Safety and Efficacy of Fazirsiran in the Treatment of Alpha-1 Antitrypsin Deficiency-Associated Liver Disease With METAVIR Stage F1 Fibrosis
ClinicalTrials.gov Identifier: NCT06165341

Amgen Inc. ("Amgen")

On September 28, 2016, Amgen and the Company entered into two collaboration and license agreements and a common stock purchase agreement. Under the Second Collaboration and License Agreement (the "Olpasiran Agreement"), Amgen received a worldwide, exclusive license to the Company's novel RNAi olpasiran (previously referred to as AMG 890 or ARO-LPA) program. These RNAi molecules are designed to reduce elevated lipoprotein(a), which is a genetically validated, independent risk factor for atherosclerotic cardiovascular disease. Under the Olpasiran Agreement, Amgen is wholly responsible for clinical development and commercialization.

In November 2022, Royalty Pharma Investments 2019 ICAV ("Royalty Pharma") and the Company entered into a Royalty Purchase Agreement (the "Royalty Pharma Agreement"). In consideration for the payments under the Royalty Pharma Agreement, Royalty Pharma is entitled to receive all royalties otherwise payable by Amgen to the Company under the Olpasiran Agreement. The Company remains eligible to receive up to an additional $485.0 million in remaining development, regulatory and sales milestone payments payable from Amgen and Royalty Pharma.

Olpasiran

Olpasiran is designed to reduce production of apolipoprotein A, a key component of lipoprotein(a), which has been genetically linked with increased risk of cardiovascular diseases, independent of cholesterol and LDL levels. Amgen completed a Phase 2 clinical study evaluating the efficacy, safety, and tolerability of olpasiran in subjects with elevated levels of lipoprotein(a). Amgen reported Phase 2 clinical results at the American Heart Association (AHA) Scientific Sessions in November 2022 and simultaneously published in the New England Journal of Medicine. Amgen began evaluating olpasiran in a Phase 3 study to assess the impact of olpasiran on major cardiovascular events in participants with atherosclerotic cardiovascular disease and elevated lipoprotein(a), in a double-blind, randomized, placebo-controlled, multi center study in December 2022.

Study Name: Olpasiran Trials of Cardiovascular Events and Lipoprotein(a) Reduction (OCEAN(a)) - Outcomes Trial
A Double-blind, Randomized, Placebo-controlled, Multicenter Study Assessing the Impact of Olpasiran on Major Cardiovascular Events in Participants With Atherosclerotic Cardiovascular Disease and Elevated Lipoprotein(a)
ClinicalTrials.gov Identifier: NCT05581303

C. Intellectual Property and Other Key Agreements

The Company controls approximately 667 issued patents (including 427 directed to RNAi trigger molecules; 144 directed to targeting groups or targeting compounds; and one for hydrodynamic gene delivery), including European validations, and approximately 745 currently pending patent applications worldwide from 92 different patent families. The Company's patent applications have been filed throughout the world, including, in the United States, Argentina, ARIPO (Africa Regional Intellectual Property Organization), Australia, Brazil, Canada, Chile, China, Eurasian Patent Organization, Europe, GCC (Gulf Cooperation Council), Hong Kong, Israel, India, Indonesia, Iraq, Jordan, Japan, Lebanon, Mexico, New Zealand, OAPI (African Intellectual Property Organization), Peru, Philippines, Russian Federation, South Africa, Saudi Arabia, Singapore, South Korea, Thailand, Taiwan, Uruguay, Venezuela, and Vietnam.

***RNAi Triggers*:** The Company owns issued patents or has filed patent applications directed to RNAi trigger molecules, which serve as the foundation of the Company's TRiM™ platform, and are targeted to reduce expression of various gene targets. However, the Company cannot guarantee that issued patents will be enforceable or provide adequate protection for the Company, or that pending patent applications will result in issued patents. These patents and patent applications include the following:

Patent Group	Estimated Year(s) of Expiration*
AAT	2035, 2038
ANGPTL3	2038
APOC3	2035, 2038
ATXN2	2044
C3	2043
CFB	2044
COVID	2043
Cx43	2029
DM1	2043
DUX4	2041
Factor 12	2036, 2038
FRP-1	2026
HBV	2032, 2036, 2037
HIF1A	2026
HIF2α	2034, 2036, 2040
HRH1	2027
HSD17B13	2039
HSF1	2030, 2032
KRAS	2033
LPA	2036
MARC1	2044
MMP7	2042
Mob-5	2027
MUC5AC	2042
P2X3	2027
PCSK9	2044
PDtype4	2026
PI4Kinase	2028
PNPLA3	2041
RAGE (AGER)	2042
RRM2	2031
SOD1	2043
SYK	2027
TNF-α	2027, 2028
TSLP	2044
XDH	2042
α-ENaC	2028, 2038
β-Catenin	2033
β-ENaC	2031, 2040

*Assuming issuance of any pending patent applications, and excluding any patent term adjustments or patent term extensions.

***Delivery Technologies*:** The delivery technology-related patents and patent applications, which include components used in the Company's TRiM™ platform, have been filed and/or issued in various jurisdictions worldwide including the United States, Argentina, Australia, Brazil, Canada, China, Eurasian Patent Organization, Europe (including validations in France, Germany, Italy, Spain, Switzerland, United Kingdom), GCC (Gulf Cooperation Council), Israel, India, Japan, Lebanon, Mexico, New Zealand, Philippines, Russia, South Africa, South Korea, Singapore,

Taiwan, and Uruguay. The Company also controls a patent directed to hydrodynamic nucleic acid delivery that issued in the United States. However, the Company cannot guarantee that issued patents will be enforceable or provide adequate protection for the Company, or that pending patent applications will result in issued patents. These various groups of patents and applications are set forth below:

Patent Group	Estimated Year(s) of Expiration*
Targeting ligands and other RNAi delivery and platform technologies	
CNS Intrathecal Delivery Platform	2043
Adipose Delivery Platform	2044
Biologically cleavable linkers	2036
LDLR targeting	2028
Muscle delivery platform	2041
Peptide targeting (CPP-Arg)	2028
Peptide targeting (YM3-10H)	2032
Physiologically labile linkers	2036
PK/PD lipid modifiers	2041
RNAi agent design (5′-phosphate mimic)	2037
Targeting groups (Galactose derivative ligands)	2037
Targeting groups (Galactose derivative trimer-PK)	2031
Targeting groups (αvβ3/αvβ5 integrin)	2034, 2038, 2039
Targeting groups (αvβ6 integrin)	2037, 2038, 2041
Transferrin targeting	2028
Trialkyne linkers	2039
Hydrodynamic delivery	
Third iteration	2024

*Assuming issuance of any pending patent applications, and excluding any patent term adjustments or patent term extensions.

The RNAi and drug delivery patent landscapes are complex and rapidly evolving. As such, the Company may need to obtain additional patent licenses prior to commercialization of its candidates. Please see “Risk Factors” in Part I, Item 1A of this Annual Report on Form 10-K.

Acquisition of Assets from Novartis

On March 3, 2015, Novartis and the Company entered into an Asset Purchase and Exclusive License Agreement (the “RNAi Purchase Agreement”) pursuant to which the Company acquired Novartis’s RNAi assets and rights thereunder. Pursuant to the RNAi Purchase Agreement, the Company acquired or was granted a license to certain patents and patent applications owned or controlled by Novartis related to RNAi therapeutics, was assigned Novartis’s rights under a license from Alnylam Pharmaceuticals, Inc. (“Alnylam”) (the “Alnylam-Novartis License”) and acquired a license to certain additional Novartis assets (the “Licensed Novartis Assets”). The patents acquired from Novartis include multiple patent families covering delivery technologies and RNAi-trigger design rules and modifications. The Licensed Novartis Assets include an exclusive, worldwide right and license, solely in the RNAi field, with the right to grant sublicenses through multiple tiers under or with respect to certain patent rights and know how relating to delivery technologies and RNAi-trigger design rules and modifications. Under the assigned Alnylam-Novartis License, the Company acquired a worldwide, royalty-bearing, exclusive license with limited sublicensing rights to existing and future Alnylam intellectual property (including intellectual property that came under Alnylam’s control on or before March 31, 2016), excluding intellectual property concerning delivery technology, to research, develop and commercialize 30 undisclosed gene targets.

Non-Exclusively Licensed Patent Rights from Roche

On October 21, 2011, the Company acquired the RNAi therapeutics business of Hoffmann-La Roche, Inc. and F. Hoffmann-La Roche Ltd. (collectively, “Roche”). The acquisition provided the Company with two primary sources of value:

- Broad freedom to operate with respect to key patents directed to the primary RNAi-trigger formats: canonical, unlocked nucleotide analogs ("UNA"), meroduplex, and dicer substrate structures; and
- A large team of scientists experienced in RNAi and oligonucleotide delivery.

Pursuant to this acquisition, Roche assigned to the Company its entire rights under certain licenses including: the License and Collaboration Agreement between Roche and Alnylam dated July 8, 2007; the Non-Exclusive Patent License Agreement between Roche and MDRNA, Inc. dated February 12, 2009 ("MDRNA License"); and the Non-Exclusive License Agreement between Roche and City of Hope dated September 19, 2011 (collectively the "RNAi Licenses").

The RNAi Licenses include licenses to patents related to modifications of double-stranded oligonucleotides, including modifications to the base, sugar, or internucleoside linkage, nucleotide mimetics, and end modifications, which do not abolish the RNAi activity of the double-stranded oligonucleotides. Also included are patents relating to modified double-stranded oligonucleotides, such as meroduplexes described in U.S. Patent No. 9,074,205 assigned to Marina Biotech (f/k/a MDRNA, Inc.), as well as U.S. Patent Nos. 8,314,227, 9,051,570, and 9,303,260 related to UNA. The UNA patents were assigned by Marina Biotech to Arcturus Therapeutics, Inc., but remain part of the MDRNA License. The RNAi Licenses further include patents related to dicer substrates and uses of the double-stranded oligonucleotides that function through the mechanism of RNA interference, such as described in City of Hope's U.S. Patent Nos. 8,084,599, 8,658,356, 8,691,786, 8,796,444, 8,809,515, and 9,518,262.

D. Government Regulation

Government authorities in the United States, at the federal, state, and local levels, and in other countries and jurisdictions, including the European Union ("EU"), extensively regulate, among other things, the research, development, testing, product approval, manufacture, quality control, manufacturing changes, packaging, storage, recordkeeping, labeling, promotion, advertising, sales, distribution, marketing, and import and export of drugs and biologic products. All of the Company's current product candidates are expected to be regulated as drugs. The processes for obtaining regulatory approval in the United States and in foreign countries and jurisdictions, along with compliance with applicable statutes and regulations and other regulatory authorities both pre- and post-commercialization, are a significant factor in the production and marketing of the Company's products and its R&D activities and require the expenditure of substantial time and financial resources.

Review and Approval of Drugs in the United States

The FDA and other government entities regulate drugs under the Federal Food, Drug, and Cosmetic Act (the "FDCA"), the Public Health Service Act, and the regulations promulgated under those statutes, as well as other federal and state statutes and regulations. Failure to comply with applicable legal and regulatory requirements in the United States at any time during the product development process, approval process, or after approval, may subject us to a variety of administrative or judicial sanctions, such as a delay in approving or refusal by the FDA to approve pending applications, withdrawal of approvals, delay or suspension of clinical trials, issuance of warning letters and other types of regulatory letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil monetary penalties, refusals of or debarment from government contracts, exclusion from the federal healthcare programs, restitution, disgorgement of profits, civil or criminal investigations by the FDA, U.S. Department of Justice, State Attorneys General, and/or other agencies, False Claims Act suits and/or other litigation, and/or criminal prosecutions.

An applicant seeking approval to market and distribute a new drug in the United States must typically undertake the following:

(1) completion of preclinical laboratory tests, which may include animal and *in vitro* studies, and formulation studies in compliance with the FDA's good laboratory practice ("GLP") regulations;

(2) submission to the FDA of an Investigational New Drug application ("IND") for human clinical testing, which must become effective without FDA objection before human clinical trials may begin;

(3) approval by an independent institutional review board ("IRB"), representing each clinical site before each clinical trial may be initiated;

(4) performance of adequate and well-controlled human clinical trials in accordance with the FDA's current good clinical practice ("cGCP") regulations, to establish the safety and effectiveness of the proposed drug product for each indication for which approval is sought;

(5) preparation and submission to the FDA of an NDA;

(6) satisfactory review of the NDA by an FDA advisory committee, where appropriate or if applicable;

(7) satisfactory completion of one or more FDA inspections of the manufacturing facility or facilities at which the drug product, and the active pharmaceutical ingredient or ingredients thereof, are produced to assess compliance with current good manufacturing practice ("cGMP") regulations and to assure that the facilities, methods, and controls are adequate to ensure the product's identity, strength, quality, and purity;

(8) payment of user fees, as applicable, and securing FDA approval of the NDA; and

(9) compliance with any post-approval requirements, such as any Risk Evaluation and Mitigation Strategies ("REMS") or post-approval studies required by the FDA.

Preclinical Studies and an IND

Preclinical studies can include *in vitro* and animal studies to assess the potential for adverse events and, in some cases, to establish a rationale for therapeutic use. The conduct of preclinical studies is subject to federal regulations and requirements, including GLP regulations. Other studies include laboratory evaluation of the purity, stability and physical form of the manufactured drug substance or active pharmaceutical ingredient and the physical properties, stability and reproducibility of the formulated drug or drug product. An IND sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical studies, among other things, to the FDA as part of an IND. Some preclinical testing, such as longer-term toxicity testing, animal tests of reproductive adverse events and carcinogenicity, may continue after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions related to a proposed clinical trial and places the trial on clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

Following commencement of a clinical trial under an IND, the FDA may place a clinical hold on that trial. A clinical hold is an order issued by the FDA to the sponsor to delay a proposed clinical investigation or to suspend an ongoing investigation. A partial clinical hold is a delay or suspension of only part of the clinical work requested under the IND. For example, a specific protocol or part of a protocol is not allowed to proceed, while other protocols may do so. No more than 30 days after imposition of a clinical hold or partial clinical hold, the FDA will provide the sponsor a written explanation of the basis for the hold. Following issuance of a clinical hold or partial clinical hold, an investigation may only resume after the FDA has notified the sponsor that the investigation may proceed. The FDA will base that determination on information provided by the sponsor correcting the deficiencies previously cited or otherwise satisfying the FDA that the investigation can proceed.

Human Clinical Studies in Support of an NDA

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators in accordance with cGCP requirements, which include, among other things, the requirement that all research subjects provide their informed consent in writing before their participation in any clinical trial. Clinical trials are conducted under written study protocols detailing, among other things, the objectives of the study, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A protocol for each clinical trial and any subsequent protocol amendments must be submitted to the FDA as part of the IND. In addition, an IRB representing each institution participating in the clinical trial must review and approve the plan for any clinical trial before it commences at that institution, and the IRB must conduct continuing review and reapprove the study at least annually. The IRB must review and approve, among other things, the study protocol and informed consent information to be provided to study subjects. An IRB must operate in compliance with FDA regulations. Information about certain clinical trials must be submitted within specific timeframes to the National Institutes of Health for public dissemination on its ClinicalTrials.gov website.

Human clinical trials are typically conducted in three sequential phases, which may overlap or be combined:

Phase 1: The product candidate is initially introduced into healthy human subjects or patients with the target disease or condition and tested for safety, dosage tolerance, absorption, metabolism, distribution, excretion and, if possible, to gain an early indication of its effectiveness.

Phase 2: The product candidate is administered to a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance and optimal dosage.

Phase 3: The product candidate is administered to an expanded patient population, generally at geographically dispersed clinical trial sites, in well-controlled clinical trials to generate enough data to statistically evaluate the efficacy and safety of the product for approval, to establish the overall risk-benefit profile of the product, and to provide adequate information for the labeling of the product.

Progress reports detailing the results of the clinical trials must be submitted at least annually to the FDA and more frequently if serious adverse events occur. Phase 1, Phase 2, and Phase 3 clinical trials may not be completed successfully within any specified period, or at all. Furthermore, the FDA or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution, or an institution it represents, if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients. The FDA will typically inspect one or more clinical sites in late-stage clinical trials to assure compliance with cGCP and the integrity of the clinical data submitted.

A sponsor may choose, but is not required, to conduct a foreign clinical study under an IND. When a foreign clinical study is conducted under an IND, all IND requirements must be met unless waived. When the foreign clinical study is not conducted under an IND, the sponsor must ensure that the study complies with certain FDA regulatory requirements in order to use the study as support for an IND or application for marketing approval or licensure, including that the study was conducted in accordance with cGCP, including review and approval by an independent ethics committee and use of proper procedures for obtaining informed consent from subjects, and the FDA is able to validate the data from the study through an onsite inspection if the FDA deems such inspection necessary. The cGCP requirements encompass both ethical and data integrity standards for clinical studies.

Submission of an NDA to the FDA

Assuming successful completion of required clinical testing and other requirements, the results of the preclinical and clinical studies, together with detailed information relating to the product's chemistry, manufacture, controls and proposed labeling, among other things, are submitted to the FDA as part of an NDA requesting approval to market the drug product for one or more indications. Under federal law, the submission of most NDAs is additionally subject to an application user fee, currently approximately $4.3 million for fiscal year 2025, for applications requiring clinical data, and the sponsor of an approved NDA is also subject to an annual program fee, currently approximately $0.4 million for fiscal year 2025. These fees are adjusted annually.

Under certain circumstances, the FDA will waive the application fee for the first human drug application that a small business, defined as a company with less than 500 employees, including employees of affiliates, submits for review. An affiliate is defined as a business entity that has a relationship with a second business entity if one business entity controls, or has the power to control, the other business entity, or a third-party controls, or has the power to control, both entities. In addition, an application to market a prescription drug product that has received orphan designation is not subject to a prescription drug user fee unless the application includes an indication for other than the rare disease or condition for which the drug was designated.

The FDA conducts a preliminary review of an NDA within 60 days of its receipt and informs the sponsor by the 74th day after the FDA's receipt of the submission to determine whether the application is sufficiently complete to permit substantive review. The FDA may request additional information rather than accept an NDA for filing. In this event, the application must be resubmitted with the additional information. The resubmitted application is also subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in-depth substantive review. The FDA has agreed to specified performance goals in the review process of NDAs. Most such applications are meant to be reviewed within ten months from the date of filing, and most applications for "priority review" products are meant to be reviewed within six months of filing. The review process may be extended by the FDA for three additional months to consider new information or clarification provided by the applicant to address an outstanding deficiency identified by the FDA following the original submission.

Before approving an NDA, the FDA typically will inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving an NDA, the FDA will typically inspect one or more clinical sites to assure compliance with cGCP.

The FDA also may require submission of a REMS plan to mitigate any identified or suspected serious risks. The REMS plan could include medication guides, physician communication plans, assessment plans, and elements to assure safe use, such as restricted distribution methods, patient registries, or other risk minimization tools.

The FDA is required to refer an application for a novel drug to an advisory committee or explain why such referral was not made. Typically, an advisory committee is a panel of independent experts, including clinicians and other scientific experts, that reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

The FDA's Decision on an NDA

On the basis of the FDA's evaluation of the NDA and accompanying information, including the results of the inspection of the manufacturing facilities, the FDA may issue an approval letter or a complete response letter. An approval letter authorizes commercial marketing of the product with specific prescribing information for specific indications. A complete response letter generally outlines the deficiencies in the submission and may require substantial additional testing or information in order for the FDA to reconsider the application. If and when those deficiencies have been addressed to the FDA's satisfaction in a resubmission of the NDA, the FDA will issue an approval letter. The FDA has committed to reviewing such resubmissions in two or six months depending on the type of information included. Even with submission of this additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

If the FDA approves a product, it may limit the approved indications for use for the product, require that contraindications, warnings or precautions be included in the product labeling, require that post-approval studies be conducted to further assess the drug's safety after approval, require testing and surveillance programs to monitor the product after commercialization, or impose other conditions, including distribution restrictions or other risk management mechanisms, including REMS, which can materially affect the potential market and profitability of the product. After approval, the FDA may seek to prevent or limit further marketing of a product based on the results of post-market studies or surveillance programs. Some types of changes to the approved product, such as adding new indications, manufacturing changes and additional labeling claims, are subject to further testing requirements and FDA review and approval.

The product may also be subject to official lot release, meaning that the manufacturer is required to perform certain tests on each lot of the product before it is released for distribution. If the product is subject to official lot release, the manufacturer must submit samples of each lot, together with a release protocol showing a summary of the history of manufacture of the lot and the results of all of the manufacturer's tests performed on the lot, to the FDA. The FDA may in addition perform certain confirmatory tests on lots of some products before releasing the lots for distribution. Finally, the FDA will conduct laboratory research related to the safety and effectiveness of drug products.

Under the Orphan Drug Act, the FDA may grant orphan drug designation to a drug intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the United States, or more than 200,000 individuals in the United States and for which there is no reasonable expectation that the cost of developing and making available in the United States a drug for this type of disease or condition will be recovered from sales in the United States for that drug. Orphan drug designation entitles the applicant to incentives such as grant funding towards clinical study costs, tax advantages, and waivers of FDA user fees. Orphan drug designation must be requested before submitting an NDA, and both the drug and the disease or condition must meet certain criteria specified in the Orphan Drug Act and FDA's implementing regulations at 21 C.F.R. Part 316. The granting of an orphan drug designation does not alter the standard regulatory requirements and process for obtaining marketing approval. Safety and effectiveness of a drug must be established through adequate and well-controlled studies.

After the FDA grants orphan drug designation, the identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. If a product that has orphan drug designation subsequently receives the first FDA approval for the disease for which it has such designation, the product is entitled to orphan product exclusivity, which means that the FDA may not approve any other application to market the same drug for the same indication, except in very limited circumstances, for seven years. Orphan drug exclusivity does not prevent the FDA from approving a different drug for the same disease or condition, or the same drug for a different disease or condition.

The FDA's interpretation of the scope of orphan drug exclusivity may change. The FDA's longstanding interpretation of the Orphan Drug Act is that exclusivity is specific to the orphan indication for which the drug was actually approved. As a result, the scope of exclusivity has been narrow and protected only against competition from the same "use or indication" rather than the broader "disease or condition." In the September 2021 case Catalyst Pharmaceuticals, Inc. v. FDA, a federal circuit court set aside the FDA's narrow interpretation and ruled that orphan drug exclusivity covers the full scope of the orphan-designated disease or condition regardless of whether the drug obtains approval only for a narrower use. The decision concerned amifampridine, a drug used to treat Lambert-Eaton myasthenic syndrome (LEMS). Depending on how the FDA applies the decision beyond this case, it may limit which drugs can receive exclusivity orphan drug.

Expedited Review and Accelerated Approval Programs

A sponsor may seek approval of its product candidate under programs designed to accelerate the FDA's review and approval of NDAs. For example, Fast Track Designation may be granted to a drug intended for treatment of a serious or life-threatening disease or condition and data demonstrate its potential to address unmet medical needs for the disease or condition. The key benefits of Fast Track Designation are the eligibility for priority review, rolling review (submission of portions of an application before the complete marketing application is submitted), and accelerated approval, if relevant

criteria are met. The FDA may grant the NDA a priority review designation, which sets the target date for FDA action on the application at six months after the FDA accepts the application for filing. Priority review is granted where there is evidence that the proposed product would be a significant improvement in the safety or effectiveness of the treatment, diagnosis, or prevention of a serious condition. Priority review designation does not change the scientific/medical standard for approval or the quality of evidence necessary to support approval.

The FDA may approve an NDA under the accelerated approval program if the drug treats a serious condition, provides a meaningful advantage over available therapies, and demonstrates an effect on either (1) a surrogate endpoint that is reasonably likely to predict clinical benefit, or (2) on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. Post-marketing studies or completion of ongoing studies after marketing approval are generally required to verify the drug's clinical benefit in relationship to the surrogate endpoint or ultimate outcome in relationship to the clinical benefit. Under the Food and Drug Omnibus Reform Act of 2022 ("FDORA"), the FDA may require, as appropriate, that such studies be underway prior to approval or within a specific time period after the date of approval for a product granted accelerated approval. The FDA also has increased authority for expedited procedures to withdraw approval of a product or indication approved under accelerated approval if the sponsor fails to conduct the required post-marketing studies or if such studies fail to verify the predicted clinical benefit. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product.

In addition, the Food and Drug Administration Safety and Innovation Act of 2012 ("FDASIA") established the Breakthrough Therapy designation. A sponsor may seek FDA designation of its product candidate as a breakthrough therapy if the drug is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. If a drug is designated as breakthrough therapy, FDA will provide more intensive guidance on the drug development program and expedite its review.

Post-Approval Requirements

Drugs manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to recordkeeping, periodic reporting, product sampling and distribution, advertising and promotion and reporting of adverse experiences with the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims, are subject to prior FDA review and approval. There also are continuing, annual user fee requirements for any marketed products and the establishments at which such products are manufactured, as well as new application fees for supplemental applications with clinical data.

In addition, drug manufacturers and other entities involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and state agencies and are subject to periodic unannounced inspections by the FDA and these state agencies for compliance with cGMP requirements. Changes to the manufacturing process are strictly regulated and often require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting and documentation requirements upon the sponsor and any third-party manufacturers that the sponsor may decide to use. Accordingly, manufacturers must continue to expend time, money, and effort in the area of production and quality control to maintain cGMP compliance.

Once an approval is granted, the FDA may withdraw the approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events or problems with manufacturing processes of unanticipated severity or frequency, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical trials to assess new safety risks; or imposition of distribution or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- fines, warning, untitled, or it has come to our attention letters, or holds on post-approval clinical trials;
- refusal of the FDA to approve pending NDAs or supplements to approved NDAs, or suspension or revocation of product license approvals;
- product seizure or detention, or refusal to permit the import or export of products; or
- injunctions or the imposition of civil or criminal penalties.

The FDA strictly regulates marketing, labeling, advertising and promotion of products that are placed on the market. Drugs may be promoted only for the approved indications and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant liability.

In addition, the distribution of prescription pharmaceutical products is subject to the Prescription Drug Marketing Act ("PDMA"), which regulates the distribution of drugs and drug samples at the federal level and sets minimum standards for the registration and regulation of drug distributors by the states. Both the PDMA and state laws limit the distribution of prescription pharmaceutical product samples and impose requirements to ensure accountability in distribution.

Abbreviated New Drug Applications for Generic Drugs

In 1984, with passage of the Drug Price Competition and Patent Term Restoration Act of 1984 (commonly referred to as the "Hatch-Waxman Amendments") amending the FDCA, Congress authorized the FDA to approve generic drugs that are the same as drugs previously approved by the FDA under the NDA provisions of the statute. To obtain approval of a generic drug, an applicant must submit an abbreviated new drug application ("ANDA") to the agency. In support of such applications, a generic manufacturer may rely on the preclinical and clinical testing previously conducted for a drug product previously approved under an NDA, known as the reference listed drug ("RLD"). To reference that information, however, the ANDA applicant must demonstrate, and the FDA must conclude, that the generic drug does, in fact, perform in the same way as the RLD it purports to copy. Specifically, in order for an ANDA to be approved, the FDA must find that the generic version is identical to the RLD with respect to the active ingredients, the route of administration, the dosage form, and the strength of the drug. However, an applicant may submit an ANDA suitability petition to request the FDA's prior permission to submit an abbreviated application for a drug that differs from the RLD in route of administration, dosage form, or strength, or for a drug that has one different active ingredient in a fixed combination drug product (i.e., a drug product with multiple active ingredients).

At the same time, the FDA must also determine that the generic drug is "bioequivalent" to the innovator drug. Under the statute, a generic drug is bioequivalent to a RLD if the rate and extent of absorption of the generic drug do not show a significant difference from the rate and extent of absorption of the RLD. Upon approval of an ANDA, the FDA indicates that the generic product is "therapeutically equivalent" to the RLD and it assigns a therapeutic equivalence rating to the approved generic drug in its publication "Approved Drug Products with Therapeutic Equivalence Evaluations," also referred to as the "Orange Book." Physicians and pharmacists consider the therapeutic equivalence rating to mean that a generic drug is fully substitutable for the RLD. In addition, by operation of certain state laws and numerous health insurance programs, the FDA's designation of a therapeutic equivalence rating often results in substitution of the generic drug without the knowledge or consent of either the prescribing physician or patient.

Under the Hatch-Waxman Amendments, the FDA may not approve an ANDA until any applicable period of nonpatent exclusivity for the RLD has expired. The FDCA provides a period of five years of data exclusivity for NDAs containing a new chemical entity. In cases where such exclusivity has been granted, an ANDA may not be filed with the FDA until the expiration of five years unless the submission is accompanied by a Paragraph IV certification, in which case the applicant may submit its application four years following the original product approval. The FDCA also provides for a period of three years of exclusivity if the NDA includes reports of one or more new clinical investigations, other than bioavailability or bioequivalence studies, that were conducted by or for the applicant and are essential to the approval of the application. This three-year exclusivity period often protects changes to a previously approved drug product, such as a new dosage form, route of administration, combination or indication.

Hatch-Waxman Patent Certification and the 30 Month Stay

Upon approval of an NDA or a supplement thereto, NDA sponsors are required to list with the FDA each patent with claims that cover the applicant's product or a method of using the product. Each of the patents listed by the NDA sponsor is published in the Orange Book. When an ANDA applicant files its application with the FDA, the applicant is required to certify to the FDA concerning any patents listed for the referenced product in the Orange Book, except for patents covering methods of use for which the ANDA applicant is not seeking approval.

Specifically, the applicant must certify with respect to each patent that:

- the required patent information has not been filed;
- the listed patent has expired;
- the listed patent has not expired, but will expire on a particular date and approval is sought after patent expiration; or
- the listed patent is invalid, unenforceable or will not be infringed by the new product.

A certification that the new product will not infringe the already approved product's listed patents or that such patents are invalid or unenforceable is called a Paragraph IV certification. If the applicant does not challenge the listed patents or indicate that it is not seeking approval of a patented method of use, the ANDA application will not be approved until all the listed patents for the referenced product have expired. If the ANDA applicant has provided a Paragraph IV certification to the FDA, the applicant must also send notice of the Paragraph IV certification to the NDA and patent holders once the ANDA has been accepted for filing by the FDA. The NDA and patent holders may then initiate a patent infringement lawsuit in response to the notice of the Paragraph IV certification. The filing of a patent infringement lawsuit within 45 days after the receipt of a Paragraph IV certification automatically prevents the FDA from approving the ANDA until the earlier of 30 months after the receipt of the Paragraph IV certification, expiration of the patent, settlement of the lawsuit or a decision in the infringement case that is favorable to the ANDA applicant.

505(b)(2) New Drug Applications

As an alternative path to FDA approval for modifications to formulations or uses of products previously approved by the FDA pursuant to an NDA, an applicant may submit an NDA under Section 505(b)(2) of the FDCA. Section 505(b)(2) was enacted as part of the Hatch-Waxman Amendments and permits the filing of an NDA where at least some of the information required for approval comes from studies not conducted by, or for, the applicant, and for which the applicant has not obtained a right of reference. If the 505(b)(2) applicant can establish that reliance on the FDA's previous findings of safety and effectiveness is scientifically and legally appropriate, it may eliminate the need to conduct certain preclinical studies or clinical trials of the new product. The FDA may also require companies to perform additional bridging studies or measurements, including clinical trials, to support the change from the previously approved reference drug. The FDA may then approve the new drug candidate for all, or some, of the label indications for which the reference drug has been approved, as well as for any new indication sought by the 505(b)(2) applicant.

To the extent that a Section 505(b)(2) applicant is relying on studies conducted for an already approved product, the applicant is required to certify to the FDA concerning any patents listed for the approved product in the Orange Book to the same extent that an ANDA applicant would. As a result, approval of a 505(b)(2) NDA can be stalled until all the listed patents claiming the referenced product have expired, until any non-patent exclusivity, such as exclusivity for obtaining approval of a new chemical entity, listed in the Orange Book for the referenced product has expired, and, in the case of a Paragraph IV certification and subsequent patent infringement suit, until the earlier of 30 months, settlement of the lawsuit or a decision in the infringement case that is favorable to the Section 505(b)(2) applicant.

Pediatric Studies and Exclusivity

Under the Pediatric Research Equity Act of 2003, an NDA or supplement thereto must contain data that are adequate to assess the safety and effectiveness of the drug product for the claimed indications in all relevant pediatric subpopulations, and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. With the enactment of FDASIA, sponsors must also submit pediatric study plans prior to the assessment data. Those plans must contain an outline of the proposed pediatric study or studies the applicant plans to conduct, including study objectives and design, any deferral or waiver requests, and other information required by regulation. The applicant, the FDA, and the FDA's internal review committee must then review the information submitted, consult with each other, and agree upon a final plan. The FDA or the applicant may request an amendment to the plan at any time.

The FDA may, on its own initiative or at the request of the applicant, grant deferrals for submission of some or all pediatric data until after approval of the product for use in adults, or full or partial waivers from the pediatric data requirements. Additional requirements and procedures relating to deferral requests and requests for extension of deferrals are contained in FDASIA. Unless otherwise required by regulation, the pediatric data requirements do not apply to products with orphan designation.

Pediatric exclusivity is another type of non-patent marketing exclusivity in the United States and, if granted, provides for the attachment of an additional six months of marketing protection to the term of any existing regulatory exclusivity, including the non-patent and orphan exclusivity. This six-month exclusivity may be granted if an NDA sponsor submits pediatric data that fairly respond to a written request from the FDA for such data. The data do not need to show the product to be effective in the pediatric population studied; rather, if the clinical trial is deemed to fairly respond to the FDA's request, the additional protection is granted. If reports of requested pediatric studies are submitted to and accepted by the FDA within the statutory time limits, whatever statutory or regulatory periods of exclusivity or patent protection cover the product are extended by six months. This is not a patent term extension, but it effectively extends the regulatory period during which the FDA cannot accept or approve another application.

Patent Term Restoration and Extension

A patent claiming a new drug product may be eligible for a limited patent term extension under the Hatch-Waxman Amendments. Those Amendments permit a patent restoration of up to five years for patent term lost during product

development and the FDA regulatory review. The restoration period granted is typically one-half the time between the effective date of an IND and the submission date of a NDA, plus the time between the submission date of a NDA and ultimate approval. Patent term restoration cannot be used to extend the remaining term of a patent past a total of 14 years from the product's approval date. Only one patent applicable to an approved drug product is eligible for the extension, and the application for the extension must be submitted prior to the expiration of the patent in question. The U.S. Patent and Trademark Office reviews and approves the application for any patent term extension or restoration in consultation with the FDA.

Review and Approval of Drugs in the European Union and United Kingdom

In order to market any pharmaceutical product outside of the United States, a company must also comply with numerous and varying regulatory requirements of other countries and jurisdictions governing, among other things, research and development, testing, manufacturing, quality control, safety, efficacy, labeling, clinical trials, marketing authorization, packaging, storage, record keeping, reporting, export and import, advertising, marketing and other promotional practices involving pharmaceutical products, as well as commercial sales, distribution, authorization, approval and post-approval monitoring and reporting of its products. Whether or not a company obtains FDA approval for a pharmaceutical product, the company would need to obtain the necessary approvals by the comparable foreign regulatory authorities before it can commence clinical trials or marketing of the pharmaceutical product in those countries or jurisdictions. The approval process ultimately varies between countries and jurisdictions and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries and jurisdictions might differ from and be longer than that required to obtain FDA approval. Regulatory approval in one country or jurisdiction does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country or jurisdiction may negatively impact the regulatory process in others.

The United Kingdom ("UK") formally left the EU on January 31, 2020 ("Brexit") and EU laws now only apply to the UK in respect of Northern Ireland as laid out in the Protocol on Ireland and Northern Ireland. The EU and the UK have agreed on a trade and cooperation agreement ("TCA") which includes provisions affecting the life sciences sector (including on customs and tariffs). There are some specific provisions concerning pharmaceuticals, including the mutual recognition of Good Manufacturing Practice ("GMP") and issued GMP documents. The TCA does not, however, contain wholesale mutual recognition of UK and EU pharmaceutical regulations and product standards.

The UK government has enacted the Medicines and Medical Devices Act 2021. The purpose of the act is to enable the existing regulatory frameworks in relation to human medicines and clinical trials of human medicines, among others, to be updated. The powers under the act may only be exercised in relation to specified matters and must safeguard public health.

The Medicines and Medical Devices Act 2021 supplements the UK Medical Devices Regulations 2002 ("UK Regulations"), which are based on the EU Medical Devices Directive as amended to reflect the UK's post-Brexit regulatory regime. Notably, the UK Regulations do not include any of the revisions that have been made by the EU Medical Devices Regulation (EU) 2017/745, which, since May 26, 2021, applies in all EU member states.

The UK's Medicines and Healthcare products Regulatory Agency ("MHRA") conducted a comprehensive consultation in 2021 on proposals to develop a new UK regime for medical devices in the UK. The proposals include more closely aligning definitions for medical devices and in vitro medical devices with internationally recognized definitions and changing the classification of medical devices according to levels or risk. The proposals are intended to improve patient and public safety and increase the appeal of the UK market. Core aspects of the new regime are planned to come into force on July 1, 2025, with strengthened post-market surveillance proposals to be introduced ahead of this in 2023.

Under the Medical Devices (Amendment) (Great Britain) Regulations 2023, CE marked European medical devices will continue to be accepted for sale in the UK until 2028 or 2030 (depending on the type of device).

Drug and Biologic Development Process

The conduct of clinical trials in the EU is governed by the EU Clinical Trials Regulation (EU) No. 536/2014 ("CTR") which entered into force on January 31, 2022. The CTR replaced the Clinical Trials Directive 2001/20/EC, (Clinical Trials Directive) and introduced a complete overhaul of the existing regulation of clinical trials for medicinal products in the EU.

Under the former regime, which will expire after a transition period of one or three years, respectively, as outlined below in more detail, before a clinical trial can be initiated, it must be approved in each EU member state where there is a site at which the clinical trial is to be conducted. The approval must be obtained from two separate entities: the National Competent Authority ("NCA"), and one or more Ethics Committees. The NCA of the EU member states in which the clinical trial will be conducted must authorize the conduct of the trial, and the independent Ethics Committee must grant a

positive opinion in relation to the conduct of the clinical trial in the relevant EU member state before the commencement of the trial. Any substantial changes to the trial protocol or other information submitted with the Clinical Trial Applications ("CTA") must be submitted to or approved by the relevant NCA and Ethics Committees. Under the current regime all suspected unexpected serious adverse reactions to the investigated drug that occur during the clinical trial must be reported to the NCA and to the Ethics Committees of the EU member state where they occur.

A more unified procedure applies under the new CTR. A sponsor is able to submit a single application for approval of a clinical trial through a centralized EU clinical trials portal, the Clinical Trials Information System ("CTIS"). One national regulatory authority (the reporting EU member state proposed by the applicant) takes the lead in validating and evaluating the application, and consults and coordinates with the other concerned EU member states. If an application is rejected, it may be amended and resubmitted through the CTIS. If an approval is issued, the sponsor may start the clinical trial in all concerned EU member states. However, a concerned EU member state may in limited circumstances declare an "opt-out" from an approval and prevent the clinical trial from being conducted in such EU member state. The CTR also aims to streamline and simplify the rules on safety reporting and introduces enhanced transparency requirements such as mandatory submission of a summary of the clinical trial results to the CTIS. The CTR includes a three-year transition period. Member states will work in CTIS immediately after the system has gone live. Since January 31, 2023, submission of initial CTA via CTIS is mandatory and CTIS serves as the single entry point for submission of clinical trial-related information and data. By January 31, 2025, all ongoing trials approved under the former Clinical Trials Directive will need to comply with the CTR and have to be transitioned to CTIS.

Under both the former regime and the new CTR, national laws, regulations, and the applicable GCP and Good Laboratory Practice standards must also be respected during the conduct of the trials, including the International Council for Harmonization of Technical Requirements for Pharmaceuticals for Human Use guidelines on GCP, and the ethical principles that have their origin in the Declaration of Helsinki.

During the development of a medicinal product, the European Medicines Agency ("EMA") and national regulators within the EU provide the opportunity for dialogue and guidance on the development program. At the EMA level, this is usually done in the form of scientific advice, which is given by the Committee for Medicinal Products for Human Use ("CHMP") on the recommendation of the Scientific Advice Working Party ("SAWP"). A fee is incurred with each scientific advice procedure, but is significantly reduced for designated orphan medicines. Advice from the EMA is typically provided based on questions concerning, for example, quality (chemistry, manufacturing and controls testing), nonclinical testing and clinical studies, and pharmacovigilance plans and risk-management programs. Advice is not legally binding with regard to any future Marketing Authorization Application ("MAA") of the product concerned.

Marketing Authorization Procedures

In the EU and in Iceland, Norway and Liechtenstein (together the European Economic Area or "EEA"), after completion of all required clinical testing, pharmaceutical products may only be placed on the market after obtaining a Marketing Authorization ("MA"). To obtain an MA of a drug under EU regulatory systems, an applicant can submit a MAA through, amongst others, a centralized or decentralized procedure.

The centralized procedure provides for the grant of a single MA by the European Commission ("EC") that is valid for all EU member states and, after respective national implementing decisions which must be rendered within 30 days, in the three additional member states of the EEA. The centralized procedure is compulsory for specific pharmaceutical products, including for medicines developed by means of certain biotechnological processes, products designated as orphan pharmaceutical products, advanced therapy pharmaceutical products and pharmaceutical products with a new active substance indicated for the treatment of certain diseases (AIDS, cancer, neurodegenerative disorders, diabetes, auto-immune and viral diseases). For pharmaceutical products containing a new active substance not yet authorized in the European Economic Area before May 20, 2004 and indicated for the treatment of other diseases, pharmaceutical products that constitute significant therapeutic, scientific or technical innovations or for which the grant of a MA through the centralized procedure would be in the interest of public health at EU level, an applicant may voluntarily submit an application for a marketing authorization through the centralized procedure.

Under the centralized procedure, the CHMP established at the EMA is responsible for conducting the initial assessment of a drug. The CHMP is also responsible for several post-authorization and maintenance activities, such as the assessment of modifications or extensions to an existing marketing authorization. Under the centralized procedure, the timeframe for the evaluation of an MAA by the EMA's CHMP is, in principle, 210 days from receipt of a valid MAA. However, this timeline excludes clock stops, when additional written or oral information is to be provided by the applicant in response to questions asked by the CHMP, so the overall process typically takes a year or more, unless the application is eligible for an accelerated assessment. Accelerated assessment might be granted by the CHMP in exceptional cases when a pharmaceutical product is expected to be of major public health interest, particularly from the point of therapeutic innovation. On request, the CHMP can reduce the time frame to 150 days if the applicant provides sufficient justification

for an accelerated assessment. The CHMP will provide a positive opinion regarding the application only if it meets certain quality, safety and efficacy requirements. However, the EC has final authority for granting the MA within 67 days after receipt of the CHMP opinion.

The decentralized procedure permits companies to file identical MA applications for a pharmaceutical product to the competent authorities in various EU member states simultaneously if such pharmaceutical product has not received marketing approval in any EU member state before. This procedure is available for pharmaceutical products not falling within the mandatory scope of the centralized procedure. The competent authority of a single EU member state, known as the reference EU member state, is appointed to review the application and provide an assessment report. Under this procedure, an applicant submits an application based on identical dossiers and related materials, including a draft summary of product characteristics, and draft labeling and package leaflet, to the reference EU member state and concerned EU member states. The reference EU member state prepares a draft assessment report and drafts of the related materials within 120 days after receipt of a valid application. Subsequently, each concerned EU member state must decide whether to approve the assessment report and related materials.

If an EU member state cannot approve the assessment report and related materials on the grounds of potential serious risk to public health, the disputed points are subject to a dispute resolution mechanism and may eventually be referred to the EC, whose decision is binding for all EU member states.

All new MAAs must include a Risk Management Plan ("RMP"), describing the risk management system that the company will put in place and documenting measures to prevent or minimize the risks associated with the product. RMPs are continually modified and updated throughout the lifetime of the medicine as new information becomes available. New RMPs are required to be submitted (i) at the request of EMA or a national competent authority, or (ii) whenever the risk-management system is modified, especially as the result of new information being received that may lead to a significant change to the benefit-risk profile or as a result of an important pharmacovigilance or risk-minimization milestone being reached. The regulatory authorities may also impose specific obligations as a condition of the MA. Since October 20, 2023, all RMPs for centrally authorized products are published by the EMA subject to only limited redactions.

Marketing Authorizations have an initial duration of five years. After these five years, the authorization may subsequently be renewed on the basis of a reevaluation of the risk-benefit balance. Once renewed, the MA is valid for an unlimited period unless the EC or the national competent authority decides, on justified grounds relating to pharmacovigilance, to proceed with only one additional five-year renewal. Applications for renewal must be made to the EMA at least nine months before the five-year period expires.

Data and Market Exclusivity in the European Union

As in the United States, it may be possible to obtain a period of market and / or data exclusivity in the EU that would have the effect of postponing the entry into the marketplace of a competitor's generic, hybrid or biosimilar product (even if the pharmaceutical product has already received an MA) and prohibiting another applicant from relying on the MA holder's pharmacological, toxicological and clinical data in support of another MA for the purposes of submitting an application, obtaining MA or placing the product on the market. New Chemical Entities ("NCE") approved in the EU qualify for eight years of data exclusivity and ten years of marketing exclusivity. The overall ten-year period can be extended to a maximum of eleven years if, during the first eight years of those ten years, the marketing authorization holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are deemed to bring a significant clinical benefit in comparison with existing therapies.

The data exclusivity period begins on the date of the product's first MA in the EU. After eight years, a generic product application may be submitted and generic companies may rely on the MA holder's data. However, a generic product cannot launch until two years later (or a total of 10 years after the first MA in the EU of the innovator product), or three years later (or a total of 11 years after the first MA in the EU of the innovator product) if the MA holder obtains MA for a new indication with significant clinical benefit within the eight-year data exclusivity period. Additionally, another noncumulative one-year period of data exclusivity can be added to the eight years of data exclusivity where an application is made for a new indication for a well-established substance, provided that significant preclinical or clinical studies were carried out in relation to the new indication. Another year of data exclusivity may be added to the eight years, where a change of classification of a pharmaceutical product has been authorized on the basis of significant pre-trial tests or clinical trials (when examining an application by another applicant for or holder of market authorization for a change of classification of the same substance the competent authority will not refer to the results of those tests or trials for one year after the initial change was authorized).

Products may not be granted data exclusivity since there is no guarantee that a product will be considered by the EU's regulatory authorities to include an NCE. Even if a compound is considered to be an NCE and the MA applicant is able to gain the prescribed period of data exclusivity, another company nevertheless could also market another version of

the pharmaceutical product if such company can complete a full MAA with their own complete database of pharmaceutical tests, preclinical studies and clinical trials and obtain MA of its pharmaceutical product.

On April 26, 2023, the EC submitted a proposal for the reform of the European pharmaceutical legislation. The current draft envisages e.g., a shortening of the periods of data exclusivity, however, there is currently neither a final version of this draft nor a date for its entry into force. Although the European Parliament adopted its approving position on the reform on April 10, 2024, no further required legislative steps have since been taken.

Orphan Designation and Exclusivity

The criteria for designating an orphan medicinal product in the EU are similar in principle to those in the United States. The EMA's Committee for Orphan Medicinal Products ("COMP") evaluates applications for orphan drug designation within 90 days and will issue a recommendation if the medicinal product is intended for the diagnosis, prevention or treatment of a life-threatening or chronically debilitating condition affecting no more than five in 10,000 persons in the EU (prevalence criterion). In addition, Orphan Drug Designation can be granted if, for economic reasons, the medicinal product would be unlikely to be developed without incentives and if there is no other satisfactory method approved in the EU of diagnosing, preventing, or treating the condition, or if such a method exists, the proposed medicinal product is a significant benefit to patients affected by the condition. Orphan drug designations are granted by the EC. An application for orphan drug designation (which is not a marketing authorization, as not all orphan-designated medicines reach the authorization application stage) must be submitted first before an application for marketing authorization of the medicinal product is submitted. The applicant will receive a fee reduction for the marketing authorization application if the orphan drug designation has been granted, but not if the designation is still pending at the time the marketing authorization is submitted, and sponsors must submit an annual report to EMA summarizing the status of development of the medicine. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process. Designated orphan medicines are eligible for conditional marketing authorization.

COMP reassesses the orphan drug designation of a product in parallel with the review for a marketing authorization; for a product to benefit from market exclusivity it must maintain its orphan drug designation at the time of marketing authorization review by the EMA and approval by the EC. Additionally, any marketing authorization granted for an orphan medicinal product must only cover the therapeutic indication(s) that are covered by the orphan drug designation. Upon the grant of a marketing authorization, orphan drug designation provides up to ten years of market exclusivity in the orphan indication.

During the 10-year period of market exclusivity, with a limited number of exceptions, the regulatory authorities of the EU member states and the EMA may not accept applications for marketing authorization, accept an application to extend an existing marketing authorization or grant marketing authorization for other similar medicinal products for the same therapeutic indication. A similar medicinal product is defined as a medicinal product containing a similar active substance or substances as contained in a currently authorized orphan medicinal product, and which is intended for the same therapeutic indication. An orphan medicinal product can also obtain an additional two years of market exclusivity for an orphan-designated condition when the results of specific studies are reflected in the Summary of Product Characteristics ("SmPC"), addressing the pediatric population and completed in accordance with a fully compliant Pediatric Investigation Plan ("PIP"). No extension to any supplementary protection certificate can be granted on the basis of pediatric studies for orphan indications.

The 10-year market exclusivity may be reduced to six years if, at the end of the fifth year, it is established that the product no longer meets the criteria for orphan designation, i.e. the condition prevalence or financial returns criteria under Article 3 of Regulation (EC) No. 141/2000 on orphan medicinal products. When the period of orphan market exclusivity for an indication ends, the orphan drug designation for that indication expires as well. Orphan exclusivity runs in parallel with normal rules on data exclusivity and market protection. Additionally, a marketing authorization may be granted to a similar medicinal product (orphan or not) for the same or overlapping indication subject to certain requirements.

Pediatric Development

In the EU, companies developing a new pharmaceutical product are obligated to study their product in children and must therefore submit a PIP together with a request for agreement to the EMA. The EMA issues a decision on the PIP based on an opinion of the EMA's Pediatric Committee ("PDCO"). Companies must conduct pediatric clinical trials in accordance with the PIP approved by the EMA, unless a deferral (*e.g.* until enough information to demonstrate its effectiveness and safety in adults is available) or waiver (*e.g.* because the relevant disease or condition occurs only in adults) has been granted by the EMA. The MAA for the pharmaceutical product must include the results of all pediatric clinical trials performed and details of all information collected in compliance with the approved PIP, unless a waiver or a deferral has been granted, in which case the pediatric clinical trials may be completed at a later date. Pharmaceutical products that are granted a marketing authorization on the basis of the pediatric clinical trials conducted in accordance with

the approved PIP are eligible for a six month extension of the protection under a supplementary protection certificate (if any is in effect at the time of approval) or, in the case of orphan pharmaceutical products, a two year extension of the orphan market exclusivity. This pediatric reward is subject to specific conditions and is not automatically available when data in compliance with the approved PIP are developed and submitted. An approved PIP is also required when a marketing authorization holder wants to add a new indication, pharmaceutical form or route of administration for a medicine that is already authorized and covered by intellectual property rights.

Post-Approval Regulation

Similar to the United States, both MA holders and manufacturers of pharmaceutical products are subject to comprehensive regulatory oversight by the EMA, the EC and/or the competent regulatory authorities of the EU member states. This oversight applies both before and after grant of manufacturing licenses and marketing authorizations. It includes control of compliance with EU good manufacturing practices rules, manufacturing authorizations, pharmacovigilance rules and requirements governing advertising, promotion, sale, and distribution, recordkeeping, importing and exporting of pharmaceutical products.

Failure by us or by any of our third-party partners, including suppliers, manufacturers and distributors to comply with EU laws and the related national laws of individual EU member states governing the conduct of clinical trials, manufacturing approval, MA of pharmaceutical products and marketing of such products, both before and after grant of MA, manufacturing of pharmaceutical products, statutory health insurance, bribery and anti-corruption or other applicable regulatory requirements may result in administrative, civil or criminal penalties. These penalties could include delays or refusal to authorize the conduct of clinical trials or to grant MA, product withdrawals and recalls, product seizures, suspension, withdrawal or variation of the MA, total or partial suspension of production, distribution, manufacturing or clinical trials, operating restrictions, injunctions, suspension of licenses, fines and criminal penalties.

The holder of an EU MA for a pharmaceutical product must also comply with EU pharmacovigilance legislation and its related regulations and guidelines, which entail many requirements for conducting pharmacovigilance, or the assessment and monitoring of the safety of pharmaceutical products.

These pharmacovigilance rules can impose on holders of MAs the obligation to conduct a labor intensive collection of data regarding the risks and benefits of marketed pharmaceutical products and to engage in ongoing assessments of those risks and benefits, including the possible requirement to conduct additional clinical studies or post-authorization safety studies to obtain further information on a medicine's safety, or to measure the effectiveness of risk-management measures, which may be time consuming and expensive and could impact our profitability. MA holders must establish and maintain a pharmacovigilance system and appoint an individual qualified person for pharmacovigilance who is responsible for oversight of that system. Key obligations include expedited reporting of suspected serious adverse reactions and submission of Periodic Safety Update Reports ("PSURs") in relation to pharmaceutical products for which they hold MAs. The EMA reviews PSURs for pharmaceutical products authorized through the centralized procedure. If the EMA has concerns that the risk-benefit profile of a product has varied, it can adopt an opinion advising that the existing MA for the product be suspended, withdrawn or varied. The agency can advise that the MA holder be obliged to conduct post-authorization Phase 4 safety studies. If the EC agrees with the opinion, it can adopt a decision varying the existing MA. Failure by the MA holder to fulfill the obligations for which the European Commission's decision provides can undermine the on-going validity of the MA.

More generally, non-compliance with pharmacovigilance obligations can lead to the variation, suspension or withdrawal of the marketing authorization for the pharmaceutical product or imposition of financial penalties or other enforcement measures.

The manufacturing process for pharmaceutical products in the EU is highly regulated and regulators may shut down manufacturing facilities that they believe do not comply with regulations. Manufacturing requires a manufacturing authorization, and the manufacturing authorization holder must comply with various requirements set out in the applicable EU laws, regulations and guidance, including Directive 2001/83/EC, Directive 2003/94/EC, Regulation (EC) No 726/2004 and the European Commission Guidelines for Good Manufacturing Practice ("GMP"). These requirements include compliance with EU GMP standards when manufacturing pharmaceutical products and active pharmaceutical ingredients, including the manufacture of active pharmaceutical ingredients outside of the EU with the intention to import the active pharmaceutical ingredients into the EU. Amendments or replacements of Directive 2001/83/EC and Regulation (EC) No 726/2004 are part of the reform proposal for European pharmaceutical legislation.

Similarly, the distribution of pharmaceutical products into and within the EU is subject to compliance with the applicable EU laws, regulations and guidelines, including the requirement to hold appropriate authorizations for distribution granted by the competent authorities of the EU member states. The manufacturer or importer must have a qualified person who is responsible for certifying that each batch of product has been manufactured in accordance with

GMP, before releasing the product for commercial distribution in the EU or for use in a clinical trial. Manufacturing facilities are subject to periodic inspections by the competent authorities for compliance with GMP.

Advertising and Promotion

The advertising and promotion of our products is also subject to EU laws concerning promotion of pharmaceutical products, interactions with physicians, misleading and comparative advertising and unfair commercial practices. In addition, other national legislation of individual EU member states may apply to the advertising and promotion of pharmaceutical products and may differ from one country to another. These laws require that promotional materials and advertising in relation to pharmaceutical products comply with the product's SmPC as approved by the competent regulatory authorities. The SmPC is the document that provides information to physicians concerning the safe and effective use of the pharmaceutical product. It forms an intrinsic and integral part of the marketing authorization granted for the pharmaceutical product. Promotion of a pharmaceutical product that does not comply with the SmPC is considered to constitute off-label promotion. All advertising and promotional activities for the product must be consistent with the approved SmPC and therefore all off-label promotion of pharmaceutical products is prohibited in the EU. Direct-to-consumer advertising of prescription-only pharmaceutical products is prohibited in the EU. Violations of the rules governing the promotion of pharmaceutical products in the EU could be penalized by administrative measures, fines and imprisonment. These laws may further limit or restrict the advertising and promotion of our products to the general public and may also impose limitations on its promotional activities with healthcare professionals.

Pricing and Reimbursement Environment

Even if a pharmaceutical product obtains a marketing authorization in the EU, there can be no assurance that reimbursement for such product will be secured on a timely basis or at all. The EU member states are free to restrict the range of pharmaceutical products for which their national health insurance systems provide reimbursement, and to control the prices and reimbursement levels of pharmaceutical products for human use. An EU member state may approve a specific price or level of reimbursement for the pharmaceutical product, or alternatively adopt a system of direct or indirect controls on the profitability of the company responsible for placing the pharmaceutical product on the market, including volume-based arrangements, caps and reference pricing mechanisms.

Reference pricing used by various EU member states and parallel distribution, or arbitrage between low-priced and high-priced member states, can further reduce prices. In some countries, we may be required to conduct a clinical study or other studies that compare the cost-effectiveness of our product candidates, if any, to other available therapies in order to obtain or maintain reimbursement or pricing approval. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products. Historically, pharmaceutical products launched in the EU do not follow price structures of the United States and generally published and actual prices tend to be significantly lower. Publication of discounts by third-party payers or authorities and public tenders may lead to further pressure on the prices or reimbursement levels within the country of publication and other countries.

The so-called health technology assessment ("HTA") of pharmaceutical products is becoming an increasingly common part of the pricing and reimbursement procedures in some EU member states, including France, Germany, Ireland, Italy and Sweden. The HTA process, which is governed by the national laws of these countries, is the procedure according to which the assessment of the public health impact, therapeutic impact, and the economic and societal impact of use of a given pharmaceutical product in the national healthcare systems of the individual country is conducted. HTA generally focuses on the clinical efficacy and effectiveness, safety, cost, and cost-effectiveness of individual pharmaceutical products as well as their potential implications for the healthcare system. Those elements of pharmaceutical products are compared with other treatment options available on the market. The outcome of HTA regarding specific pharmaceutical products will often influence the pricing and reimbursement status granted to pharmaceutical products by the regulatory authorities of individual EU member states. A negative HTA of one of our products by a leading and recognized HTA body could not only undermine our ability to obtain reimbursement for such product in the EU member state in which such negative assessment was issued, but also in other EU member states. For example, EU member states that have not yet developed HTA mechanisms could rely to some extent on the HTA performed in other countries with a developed HTA framework, when adopting decisions concerning the pricing and reimbursement of a specific pharmaceutical product.

On January 31, 2018, the European Commission adopted Regulation (EU) 2021/2282 on health technology assessment ("HTAR"). HTAR entered into force on January 11, 2022 and applies from January 12, 2025 onwards, followed by a further three-year transitional period during which EU member states must fully adapt to the new system. HTAR intends to boost EU level cooperation among EU member states in assessing health technologies, including new pharmaceutical products, and to provide the basis for cooperation at the EU level for joint clinical assessments in these areas. Under HTAR, EU member states will be able to use common HTA tools, methodologies and procedures across the

EU, working together in four main areas: the joint clinical assessment of the innovative health technologies with the most potential impact for patients; joint scientific consultations whereby developers can seek advice from HTA authorities; identification of emerging health technologies to identify promising technologies early; and continuing voluntary cooperation in other areas. Individual EU member states will continue to be responsible for assessing non-clinical (*e.g.*, economic, social, ethical) aspects of health technology, and making decisions on pricing and reimbursement. While EU member states can choose to delay participation in the joint network until three years after the rules enter into force, it will become mandatory after six years. The European Commission has stated that the role of the HTA regulation is not to influence pricing and reimbursement decisions in the individual EU member states, but there can be no assurance that the HTA regulation will not have effects on pricing and reimbursement decisions.

To obtain reimbursement or pricing approval in some countries, including the EU member states, we may be required to conduct studies that compare the cost-effectiveness of our product candidates to other therapies that are considered the local standard of care. There can be no assurance that any country will allow favorable pricing, reimbursement and market access conditions for any of our products, or that we will be feasible to conduct additional cost-effectiveness studies, if required.

In certain EU member states, pharmaceutical products designated as orphan pharmaceutical products may be exempted or waived from having to provide certain clinical, cost-effectiveness and other economic data in connection with their filings for pricing/reimbursement approval.

Data Privacy and Security Laws

There are numerous U.S. federal, state, and local laws and regulations, as well as foreign legislation, in particular in the EU and UK, which regulate personal information, including how that information may be used, processed, and disclosed. These regulations also cover sensitive personal information, including medical and health information, and impose requirements on entities that handle such information to implement certain privacy and security measures. We and/or our partners may be subject to these laws.

In the United States, at the federal level, the Health Insurance Portability and Accountability Act of 1996 ("HIPAA"), as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 ("HITECH Act"), and the regulations promulgated thereunder, impose data privacy, security and data breach reporting obligations with respect to protected health information ("PHI") on covered entities—which include health plans, healthcare clearinghouses and certain healthcare providers—and business associates—which include persons or entities that perform certain functions or activities that involve the use or disclosure of PHI on behalf of, or in connection with providing a service for, a covered entity.

There are also a number of U.S. state privacy laws, such as the California Consumer Privacy Act of 2018 ("CCPA"), as amended by the California Privacy Rights Act of 2020 ("CPRA"), that govern the privacy and security of personal information in certain circumstances. The CCPA/CPRA applies to personal data of consumers (which is defined to include business representatives and employees) who are California residents, imposes obligations on certain businesses that do business in California, including to provide specific disclosures in privacy notices, and affords rights to California residents in relation to their personal information. Health information falls under the CCPA/CPRA's definition of personal information where it identifies, relates to, describes, is reasonably capable of being associated with or could reasonably be linked, directly or indirectly, with a particular consumer or household and is considered "sensitive personal information," which is offered greater protection. However, the CCPA/CPRA, like other U.S. state privacy laws, does not apply to PHI, and other U.S. state entities exempt covered entities and business associates altogether. Some of these laws and regulations impose different, and in certain instances, more stringent requirements than HIPAA. Failing to comply with these laws and regulations can result in significant civil and/or criminal penalties, as well as, in some cases, exposure to private litigation, all of which can result in financial and reputational risks.

The collection and use of personal health data and other personal data in the EU is governed by the provisions of the European General Data Protection Regulation (EU) 2016/679 ("GDPR"), which came into force in May 2018, and by related implementing laws in the individual EU member states. The GDPR has a number of significant practical consequences, in particular for international data transfers, competent supervisory authorities and enforcement of the GDPR. The GDPR increased responsibility and liability in relation to personal data that we process.

The GDPR imposes a number of strict obligations and restrictions on the ability to process (processing includes collection, analysis and transfer of) personal data of individuals in the EEA, including health data from clinical trials and adverse event reporting. The GDPR also includes requirements relating to the consent of the individuals to whom the personal data relates, the information provided to the individuals prior to processing their personal data or personal health data, notification obligations to the national data protection authorities and the security and confidentiality of the personal

data. EU member states may also impose additional requirements in relation to health, genetic and biometric data through their national implementing legislation.

The GDPR also imposes specific restrictions on the transfer of personal data to countries outside of the EEA that are not considered by the European Commission to provide an adequate level of data protection. Appropriate safeguards are required to enable such transfers. Among the appropriate safeguards that can be used, the data exporter may use the standard contractual clauses ("SCCs"). In this respect, on June 4, 2021, the EU Commission has issued a new set of SCCs which replace the old sets of SCCs that were adopted under the previous European Data Protection Directive 95/46. In addition, when relying on SCCs, the data exporters are required to conduct a transfer risk assessment to verify if anything in the law and/or practices of the third country may impinge on the effectiveness of the SCCs in the context of the transfer at stake and, if so, to identify and adopt supplementary measures that are necessary to bring the level of protection of the data transferred to the EU standard of essential equivalence. Where no supplementary measure is suitable, the data exporter should avoid, suspend or terminate the transfer. On June 18, 2021, the European Data Protection Board adopted recommendations to assist data exporters with such assessment and their duty to identify and implement supplementary measures where they are needed to ensure compliance with the EU level of protection to the personal data they transfer to third countries. With regard to the transfer of data from the EEA to the US, on July 10, 2023, the European Commission adopted its adequacy decision for the EU-US Data Privacy Framework. On the basis of the new adequacy decision, personal data can flow from the EEA to US companies participating in the framework.

Failure to comply with the requirements of the GDPR and the related national data protection laws of the EU member states may result in significant monetary fines for noncompliance of up to €20 million or 4% of the annual global revenues of the noncompliant company – whichever is greater – other administrative penalties, and a number of criminal offenses (punishable by uncapped fines) for organizations and in certain cases their directors and officers as well as civil liability claims from individuals whose personal data was processed. Data protection authorities from the different EU member states may still implement certain variations, enforce the GDPR and national data protection laws differently, and introduce additional national regulations and guidelines, which adds to the complexity of processing personal data in the EU. Guidance developed at both EU level and at the national level in individual EU member states concerning implementation and compliance practices are often updated or otherwise revised.

There is, moreover, a growing trend towards required public disclosure of clinical trial data in the EU which adds to the complexity of obligations relating to processing health data from clinical trials. Such public disclosure obligations are provided in the EU Clinical Trials Regulation, EMA disclosure initiatives and voluntary commitments by industry. Failing to comply with these obligations could lead to government enforcement actions and significant penalties against us, harm to our reputation, and adversely impact our business and operating results. The uncertainty regarding the interplay between different regulatory frameworks, such as the Clinical Trials Regulation and the GDPR, further adds to the complexity that we face with regard to data protection regulation.

With regard to the transfer of data from the EEA to the UK, on June 28, 2021 the European Commission adopted two adequacy decisions for the UK: one under the GDPR and the other for the Law Enforcement Directive. Personal data may now freely flow from the EU to the UK since the UK is deemed to have an adequate data protection level for the purposes of the EU regime. However, the adequacy of decisions are subject to a 'sunset clause' which entails that the decisions will automatically expire four years after their entry into force, unless renewed. Additionally, following the UK's withdrawal from the EEA, companies also have to comply with the UK's data protection laws (including the GDPR as incorporated into UK national law), the latter regime having the ability to impose fines up to the greater of £17.5 million or 4% of global turnover. Furthermore, transfers from the UK to other countries, including to the EEA, are subject to specific transfer rules under the UK regime; personal data may freely flow from the UK to the EEA, since the EEA is deemed to have an adequate data protection level for purposes of the UK regime. These UK international transfer rules broadly mirror the EU GDPR rules. On February 2, 2022, the UK Secretary of State laid before the UK Parliament the international data transfer agreement (IDTA) and the international data transfer addendum to the European Commission's standard contractual clauses for international data transfers (Addendum) and a document setting out transitional provisions. The IDTA and Addendum came into force on March 21, 2022 and replaced the old EU SCCs for the purposes of the UK regime.

With regard to the transfer of data from the UK to the US, the UK government has adopted an adequacy decision for the US, the UK-US Data Bridge, which came into force on October 12, 2023. The UK-US Data Bridge recognizes the US as offering an adequate level of data protection where the transfer is to a US company participating in the EU-US Data Privacy Framework and the UK Extension.

Promotional Activities

In the EU, interactions between pharmaceutical companies and physicians are also governed by strict laws, regulations, industry self-regulation codes of conduct and physicians' codes of professional conduct both at EU level and in

the individual EU member states. The provision of benefits or advantages to physicians to induce or encourage the prescription, recommendation, endorsement, purchase, supply, order or use of pharmaceutical products is prohibited in the EU. The provision of benefits or advantages to physicians is also governed by the national anti-bribery laws of the EU member states. Violation of these laws could result in substantial fines and imprisonment.

Payments made to physicians in certain EU member states must be publicly disclosed. Moreover, agreements with physicians must often be the subject of prior notification and approval by the physician's employer, their regulatory professional organization, and/or the competent authorities of the individual EU member states. These requirements are provided in the national laws, industry codes, or professional codes of conduct, applicable in the individual EU member states. Failure to comply with these requirements could result in reputational risk, public reprimands, administrative penalties, fines or imprisonment.

While the UK has left the EU, as mentioned above, it should be noted that the UK still has the strictest anti-bribery regime in Europe, the UK Bribery Act 2010. The Act is applicable English law and continues to apply to any company incorporated in or "carrying on business" in the UK, irrespective of where in the world the alleged bribery activity occurs.

Other Legislation Regarding Marketing, Authorization and Pricing of Pharmaceutical Products in the European Union

Other core legislation relating to the marketing, authorization and pricing of pharmaceutical products in the EU exists as regulations and directives, while the implementing acts and guidelines based on these may vary in each EU member state. In addition, the respective national provisions of the member states, as well as self-committed codes of the pharmaceutical industry, must be observed. Such regulations and directives include the following:

- Directive 2001/83/EC, establishing the requirements and procedures governing the marketing authorization for medicinal products for human use, as well as the rules for the constant supervision of products following authorization. This Directive has been amended several times, most recently by Directive 2012/26/EU regarding pharmacovigilance, and the Falsified Medicines Directive 2011/62/EU.
- Regulation (EC) 726/2004, as amended, establishing procedures for the authorization, supervision and pharmacovigilance of medicinal products for human and veterinary use and establishing the EMA.
- Regulation (EC) 469/2009, establishing the requirements necessary to obtain a Supplementary Protection Certificate, which extends the period of patent protection applicable to medicinal products at the EU-level.
- Directive 89/105/EEC, ensuring the transparency of measures taken by the EU member states to set the prices and reimbursements of medicinal products. Specifically, while each member state has competence over the pricing and reimbursement of medicines for human use, they must also comply with this Directive, which establishes procedures to ensure that member state decisions and policies do not obstruct trade in medicinal products. The European Commission proposed to repeal and replace Directive 89/105/EEC, but this proposal was withdrawn in 2015.
- Directive 2003/94/EC, laying down the principles of good manufacturing practice in respect of medicinal products and investigational medicinal products for human use (the "GMP Directive"); repealed by Directive 2017/1572 on January 31, 2022; this directive also lays out standards and principles for manufacturing practices of medicinal products for human use and investigational medicinal products for human use.
- Directive 2005/28/EC of April 8, 2005, laying down principles and detailed guidelines for good clinical practice as regards investigational medicinal products for human use, as well as the requirements for authorization of the manufacturing or importation of such products (the "GCP Directive").
- Directives 2004/9/EC and 2004/10/EC laying down principles of GLP including on the organizational process under which non-clinical health and safety studies are performed.
- Directive 2010/84/EU and Regulation (EU) 1235/2010 on pharmacovigilance laying down procedures for the authorization and supervision of medicinal products for human and veterinary use.
- Directive 2006/114/EC concerning misleading and comparative advertising.
- Directive 2005/29/EC regulating unfair business-to-consumer commercial practices that occur before, during and after a business-to-consumer transaction.
- Regulation (EC) 1223/2009 on Cosmetic Products, setting mandatory requirements for cosmetics which are available on the market within the EU.
- Regulation (EC) 1901/2006 on Pediatric Use, laying down rules to ensure that medicines for use in children are researched, developed and authorized appropriately.

- Directive (2004/109/EC) on Transparency laying down rules to improves the harmonization of information duties of issuers, whose securities are listed at a regulated market at a stock exchange within the EU; amended by Directive (EU) 2022/2464 with effect from May 1, 2023 as regards corporate sustainability reporting.

Pharmaceutical Coverage, Pricing and Reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of products approved by the FDA and other government authorities. Sales of products will depend, in part, on the extent to which the costs of the products will be covered by third-party payors, including government health programs such as, in the United States, Medicare and Medicaid, commercial health insurers and managed care organizations. The process for determining whether a payor will provide coverage for a product may be separate from the process for setting the price or reimbursement rate that the payor will pay for the product once coverage is approved. Third-party payors may limit coverage to specific products on an approved list, or formulary, which might not include all of the approved products for a particular indication.

In order to secure coverage and reimbursement for any product that might be approved for sale, a company may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of the product, in addition to the costs required to obtain FDA or other comparable regulatory approvals. A payor's decision to provide coverage for a drug product does not necessarily imply that an adequate reimbursement rate will be approved. Third-party reimbursement may not be sufficient to maintain price levels high enough to realize an appropriate return on our investment in product development.

The containment of healthcare costs has become a priority of federal, state and foreign governments, and the prices of drugs have been a focus in this effort. Third-party payors are increasingly challenging the prices charged for medical products and services and examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy. If these third-party payors do not consider a product to be cost effective compared to other available therapies, they may not cover the product after approval as a benefit under their plans or, if they do, the level of payment may not be sufficient to allow a company to sell its products at a profit. The U.S. government, state legislatures and foreign governments have shown significant interest in implementing cost containment programs to limit the growth of government-paid health care costs, including price controls, risk sharing, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs. Recently, the U.S. government passed the Inflation Reduction Act ("IRA"), which authorizes the U.S. Department of Health and Human Services to negotiate prices of certain drugs with participating manufacturers in federal healthcare programs. Adoption of such controls and measures and tightening of restrictive policies in jurisdictions with existing controls and measures, could limit payments for pharmaceuticals. As a result, the marketability of any product which receives regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement.

In addition, an increasing emphasis on managed care in the United States has increased and will continue to increase the pressure on drug pricing. Coverage policies, third-party reimbursement rates and drug pricing regulation may change at any time. In particular, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Affordability Reconciliation Act, contains provisions that may reduce the profitability of drug products, including, for example, increased rebates for drugs sold to Medicaid programs, extension of Medicaid rebates to Medicaid managed care plans, mandatory discounts for certain Medicare Part D beneficiaries and annual fees based on pharmaceutical companies' share of sales to federal health care programs. Even if favorable coverage and reimbursement status is attained for one or more products that receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

In the EU, pricing and reimbursement schemes vary widely between member states. Some countries provide that drug products may be marketed only after a reimbursement price has been agreed. Some member states may require the completion of additional studies that compare the cost-effectiveness of a particular product candidate to currently available therapies. For example, the EU provides options for its member states to restrict the range of drug products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. EU member states may approve a specific price for a drug product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the drug product on the market. Other member states allow companies to fix their own prices for drug products but monitor and control company profits. The downward pressure on health care costs in general, particularly prescription drugs, has become intense. As a result, increasingly high barriers are being erected to the entry of new products. In addition, in some countries, cross-border imports from low-priced markets exert competitive pressure that may reduce pricing within a country. Any country that has price controls or reimbursement limitations for drug products may not allow favorable reimbursement and pricing arrangements for any of our products.

Healthcare Laws and Regulations

Healthcare providers, physicians and third-party payors play important roles in the recommendation and prescription of drug products that are granted marketing approval. Arrangements with healthcare providers, physicians, third-party payors and customers are subject to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which the Company markets, sells and distributes products for which it obtains marketing approval. Restrictions under applicable federal and state healthcare laws and regulations, include the following:

- the federal Anti-Kickback Statute prohibits, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing any remuneration (in cash or in kind), directly or indirectly, to induce or reward either the referral of an individual for, or the purchase, lease, order or recommendation of, any item, facility or service for which payment may be made in whole or in part under a federal healthcare program such as Medicare and Medicaid;
- the federal Foreign Corrupt Practices Act prohibits, among other things, U.S. corporations and persons acting on their behalf from offering, promising, authorizing or making payments to any foreign government official (including certain healthcare professionals in many countries), political party, or political candidate in an attempt to obtain or retain business or otherwise seek preferential treatment abroad;
- the federal False Claims Act, which may be enforced by the U.S. Department of Justice or private whistleblowers who bring civil actions (qui tam actions) on behalf of the federal government, imposes civil penalties, as well as liability for treble damages and for attorneys' fees and costs, on individuals or entities for knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent, making a false statement material to a false or fraudulent claim, or improperly avoiding, decreasing, or concealing an obligation to pay money to the federal government;
- the U.S. Department of Health and Human Services' Civil Monetary Penalty authorities, which imposes administrative sanctions for, among other things, presenting or causing to be presented false claims for government payment and providing remuneration to government health program beneficiaries to influence them to order or receive healthcare items or services;
- HIPAA imposes criminal and civil liability for, among other conduct, executing a scheme to defraud any healthcare benefit program and making false statements relating to healthcare matters;
- HIPAA, as amended by the HITECH Act and its implementing regulations, also imposes criminal and civil liability and penalties on those who violate requirements, including mandatory contractual terms, intended to safeguard the privacy, security, transmission and use of individually identifiable health information;
- the federal false statements statute relating to healthcare matters imposes criminal liability for knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement in connection with the delivery of or payment for healthcare benefits, items or services;
- the federal Physician Payment Sunshine Act requires manufacturers of drugs (among other products) to report to the Centers for Medicare and Medicaid Services within the U.S. Department of Health and Human Services information related to payments and other transfers of value to various healthcare professionals including physicians, physician assistants, nurse practitioners, clinical nurse specialists, certified nurse anesthetists, certified nurse-midwives and teaching hospitals, as well as physician ownership and investment interests in the reporting manufacturers;
- similar state and foreign laws and regulations, such as state anti-kickback and false claims laws, may apply (e.g., in the EU, where the implementation of EU-wide regulations as well as independent national legislation may vary for each EU member state) to sales or marketing arrangements and claims involving healthcare items or services reimbursed by nongovernmental third-party payors, including private insurers; and
- certain state laws require pharmaceutical companies to comply with voluntary compliance guidelines promulgated by a pharmaceutical industry association and relevant compliance guidance issues by the U.S. Department of Health and Human Services Office of Inspector General; bar drug manufacturers from offering or providing certain types of payments or gifts to physicians and other health care providers; and/or require disclosure of gifts or payments to physicians and other healthcare providers.

Various state and foreign laws also govern the privacy and security of health information in some circumstances; many of these laws differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

E. Facilities and Resources

The Company's principal executive offices are located in Pasadena, California. The Company further recently expanded its footprint with a new manufacturing and laboratory facility to manufacture drug substance (API) under current Good Manufacturing Practices (GMP) in Verona, Wisconsin.

Research and Development Facilities

The Company operates research laboratory facilities in San Diego, California and Madison, Wisconsin, where its pre-clinical research and development activities, including the discovery and early development of RNAi therapeutics, take place. A summary is provided below:

- State-of-the-art laboratories with supporting office space that comprise more than 251,000 total square feet;
- Cell culture laboratories;
- Complete animal facilities;
- Animal efficacy models for numerous diseases, including cardio metabolic, viral, liver, skeletal muscle, ocular, central nervous system (CNS), metabolic, obesity and lung diseases;
- Animal safety screening and assessment;
- Clinical pathology laboratories and in-house histopathology capabilities;
- Drug metabolism and pharmacokinetics (DMPK), bioanalytical, biodistribution, and clearance assessment and methodology capabilities;
- Primate colony housed at the Wisconsin National Primate Research Center, an affiliate of the University of Wisconsin, and at other contract research organizations (CROs);
- Pharmacodynamic method development and analysis and translational biomarker development capabilities;
- Conventional and confocal microscopy, flow cytometry, Luminex platform, qRT-PCR and clinical chemistry analytics; and
- Oligonucleotide, peptide, antibody, and small molecule discovery, synthesis, and analytics capabilities (for example, HPLC, NMR, and LCMS).

GMP Manufacturing and Related Development Laboratory Facility

The Company also recently expanded into a new, state-of-the-art GMP manufacturing facility in Verona, Wisconsin that includes related laboratories and office space to support chemistry, manufacturing, and controls (CMC) and quality activities. A summary is provided below:

- State-of-the-art, custom-designed GMP oligonucleotide manufacturing facility with related support laboratories for process development and analytical development, comprising approximately 300,000 total square feet;
- Full certificate of occupancy for laboratory, office & manufacturing spaces obtained August 2024;
- Full analytical chemistry capabilities including method development and validation, transfer of methods, and support of in-process and final product analysis;
- Drug product formulation development capabilities;
- In-house capabilities to release GMP drug substance and finished drug product;
- Multiple equipment scales for oligonucleotide manufacturing with maximum capacity to manufacture hundreds of kilograms of GMP drug substance annually; and
- Drug substance manufacturing capabilities to produce and release GMP material (API) and capabilities to release finished drug product pending ongoing commissioning, qualification, and validation (CQV) activities, which are scheduled to allow for the manufacture of GMP drug substance at the facility which is currently anticipated to begin by December 2024.

F. Human Capital Management

As of September 30, 2024, the Company employed 609 full-time employees based at four facilities in the United States, including Pasadena and San Diego, California, and Madison and Verona, Wisconsin. The following table presents the total number of employees as of September 30 by location.

Site	2024	2023
Pasadena, CA	141	137
San Diego, CA	135	104
Madison, WI	202	284
Verona, WI	131	—
Total	609	525

In fiscal year 2024, the Company continued to expand its workforce, focusing on increasing in-house manufacturing capacity, as well as enhancing expertise and throughput in clinical and preclinical research and development and commercialization preparation. The Company continually evaluates the business need and opportunity and balances in-house expertise and capacity with outsourced expertise and capacity. Currently, the Company outsources substantial clinical trial work to clinical research organizations and certain drug manufacturing to contract manufacturers.

Drug development is a complex endeavor which requires deep expertise and experience across a broad array of disciplines. Pharmaceutical companies both large and small compete for a limited number of qualified applicants to fill specialized positions. To attract qualified applicants to the Company, it offers a total compensation package consisting of base salary and cash target bonus targeting the 50th to 75th percentile of market, and offers a comprehensive benefit package and equity compensation to every employee. Bonus opportunity and equity compensation increase as a percentage of total compensation based on level of responsibility. Actual bonus payout is based on performance.

A significant portion of the Company's employees have obtained advanced degrees in their professions. The Company supports its employees' further development with individualized development plans, mentoring, coaching, group training, conference attendance and financial support including tuition reimbursement.

Diversity and Inclusion

The Company is dedicated to fostering a welcoming, healthy and equitable environment where all employees can thrive and contribute to its mission of delivering safe and effective medicine to patients in need. Ongoing efforts include formal training programs and processes that promote awareness of inclusion and diversity, such as anti-bias training and employee engagement initiatives. The Company's Diversity, Equity, and Inclusion (DEI) committee, comprised of a diverse group of employees across each of its worksites, meets regularly to provide well-attended education and outreach opportunities. The DEI committee also advises its senior management on building a more diverse, equitable, and inclusive workplace.

G. Investor Information

The Company's website address is http://www.arrowheadpharma.com. The Company's website address is not intended to function as a hyperlink and the information contained on its website is not, and should not be considered part of, and is not incorporated by reference into, this Annual Report on Form 10-K. The Company's reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), including its Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, Proxy Statements, and amendments to such periodic reports and Proxy Statements, are accessible through its website, free of charge, as soon as reasonably practicable after these reports are filed electronically with, or otherwise furnished to, the SEC. These SEC reports can be accessed through the "Investors" section of the Company's website.

The SEC maintains an Internet website that contains reports, proxy and information statements, and other information regarding the Company and other issuers that file electronically with the SEC. The SEC's Internet website address is http://www.sec.gov.

ITEM 1A. RISK FACTORS

The Company's business involves various risks and uncertainties in addition to the normal risks of business, some of which are discussed in this section. It should be noted that the Company's business may be adversely affected by general economic conditions and other forces beyond the Company's control. In addition, other risks and uncertainties not presently known or that the Company currently believes to be immaterial may also adversely affect the Company's business. Any such risks or uncertainties, or any of the following risks or uncertainties, that develop into actual events could result in a material and adverse effect on the Company's business, financial condition, results of operations, or liquidity.

The information discussed below should be considered carefully with the other information contained in this Annual Report on Form 10-K and the other documents and materials filed by the Company with the SEC, as well as news releases and other information publicly disseminated by the Company from time to time.

Risk Factors Summary

Risks Related to Our Discovery, Development, and Commercialization of Medicines

- Our prospects substantially depend on the success of our clinical-stage product candidates. If we and our licensees are unable to obtain approval for and commercialize these product candidates, our business could be materially harmed.
- There are substantial risks inherent in attempting to commercialize our new drugs, and, as a result, we may not be able to successfully develop products for commercial use.
- Our product candidates are in clinical development, which is a lengthy and expensive process with uncertain outcomes and the potential for substantial delays. There can be no assurance that our product candidates will obtain regulatory approval, which is necessary before they can be commercialized.
- Our clinical trials may not yield successful results for the product candidates that we may identify and pursue for their intended uses, which would prevent, delay or limit the scope of regulatory approval and commercialization.
- Our clinical trials may reveal significant adverse events, toxicities or other side effects and may result in a safety profile that could inhibit regulatory approval or market acceptance of any of our product candidates.
- Results of earlier studies or clinical trials may not be predictive of future clinical trial results, and initial studies or clinical trials may not establish an adequate safety or efficacy profile for our product candidates to justify proceeding to advanced clinical trials or an application for regulatory approval.
- We face potential product liability exposure, and if successful claims are brought against us, we may incur substantial liability for a product candidate and may have to limit its commercialization.
- The successful commercialization of our product candidates, if approved, will depend in part on the extent to which government authorities and health insurers establish adequate reimbursement levels and pricing policies.
- Our commercialization, collaborative and other arrangements may give rise to disputes over commercial terms, contract interpretation and ownership or protection of our intellectual property and may adversely affect the commercial success of our products.

Risks Related to Regulatory Review and Approval of Our Candidates

- A Fast Track product designation may not lead to a faster development or regulatory review or approval process, and it does not increase the likelihood that our product candidates will receive marketing approval.
- We and our licensees conduct clinical trials for product candidates outside the United States, and the FDA and comparable foreign regulatory authorities may not accept data from such trials.
- Even if we obtain FDA approval for products in the United States, we may never obtain approval to commercialize any product candidates outside of the United States, which would limit our ability to realize their full market potential.
- Even if our product candidates are approved for commercialization, failure to comply with regulatory requirements or unanticipated problems with our products may result in various adverse actions such as the suspension or withdrawal of one or more of our products, closure of a facility or enforcement of substantial penalties or fines.
- Pharmaceutical and biological product marketing is subject to substantial regulation in the U.S. and any failure by us or our commercial and collaborative partners to comply with applicable statutes or regulations can adversely affect our business.

Risks Related to Our Intellectual Property

- Our ability to protect our patents and other proprietary rights is uncertain, exposing us to the possible loss of competitive advantage.

- We are party to technology license agreements with third parties that require us to satisfy obligations to keep them effective and, if these agreements are terminated, our technology and our business could be seriously and adversely affected.

Risks Related to Our Business Model

- Our business model assumes we will generate revenue by, among other activities, marketing or out-licensing the products we develop. Our drug candidates are in various stages of development and we have no approved products based on RNA interference and our delivery technologies. Accordingly, there is a limited amount of information about us upon which you can evaluate our business and prospects.
- We may need to establish additional relationships with strategic and development partners to fully develop our drug candidates and market any approved products.
- Our ability to generate milestone and royalty payments under our current and potential future licensing and collaboration agreements is substantially controlled by our partners, and as such, we will likely need other sources of financing to continue to develop our internal drug candidates.
- We may lose a considerable amount of control over our intellectual property and may not receive anticipated revenues in strategic transactions, particularly where the consideration is contingent on the achievement of development or sales milestones.
- We will need to achieve commercial acceptance of our drug candidates to generate revenues and achieve profitability.
- If the market opportunities for our approved product candidates, if any, are smaller than we expect, it could materially adversely affect our financial condition and results of operations.
- We have limited manufacturing capability and must rely on third-party manufacturers to manufacture our clinical supplies and commercial products, if and when approved, and if they fail to meet their obligations, the development and commercialization of our products could be adversely affected.
- We rely on third parties to conduct our clinical trials, and if they fail to fulfill their obligations, the development of our products may be adversely affected.
- We face competition from various entities including large pharmaceutical companies, small biotech companies, private companies, and research institutions.
- We may have difficulty expanding our operations successfully as we evolve our pipeline and move toward commercializing drugs.
- Because we use biological materials, hazardous materials, chemicals and radioactive compounds, if we do not comply with laws regulating the protection of the environment and health and human safety, our business could be adversely affected.
- Our operations, including our relationships with healthcare providers, physicians and third-party payers, are subject to applicable anti-kickback, fraud and abuse, and other healthcare laws and regulations, which, in the event of a violation, exposes us to liability for criminal sanctions, civil penalties, and contractual damages, and reputational harm and diminished profits and future earnings.
- The actions of distributors and specialty pharmacies could affect our ability to sell or market products profitably. Fluctuations in buying or distribution patterns by such distributors and specialty pharmacies could adversely affect our revenues, financial condition, or results of operations.

Risks Related to Our Financial Condition

- We have a history of net losses, and we expect to continue to incur net losses and may not achieve or maintain profitability.
- We will require substantial additional funds to complete our research and development activities.
- The terms of our Sixth Street Financing Agreement and our indebtedness could adversely affect our operations and limit our ability to plan for or respond to changes in our business. If we are unable to comply with restrictions in our Sixth Street Financing Agreement, the repayment of our existing indebtedness could be accelerated.
- If the estimates we make, or the assumptions on which we rely, in preparing our consolidated financial statements prove inaccurate, our actual results may vary from those reflected in our accruals.
- Our operating results may fluctuate significantly, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations or our guidance.
- The investment of our cash, cash equivalents and fixed income securities is subject to risks which may cause losses and affect the liquidity of these investments.
- Our ability to utilize net operating loss carryforwards and other tax benefits may be limited.

Risks Related to Investment and Securities

- If securities or industry analysts do not publish research reports about our business or if they make adverse recommendations regarding an investment in our stock, our stock price and trading volume may decline.

- The market for purchases and sales of our common stock may be limited, and the sale of a limited number of shares could cause the price to fall sharply.
- Our common stock price has fluctuated significantly over the last several years and may continue to do so in the future, without regard to our results of operations and prospects.

Economic and Industry Risks

- Drug development is time consuming, expensive and risky.
- Regulatory standards are subject to change over time, making it difficult to accurately predict the likelihood of marketing approval even when clinical trials meet their endpoints.

Risks Related to Our Discovery, Development, and Commercialization of Medicines

Our prospects substantially depend on the success of our clinical-stage product candidates. If we and our licensees are unable to obtain approval for and commercialize these product candidates, our business could be materially harmed.

Our future success is substantially dependent on the ability of our company and our licensees to timely complete clinical trials and obtain marketing approval for, and then successfully commercialize our clinical-stage product candidates. We are not permitted to market or promote our product candidates before we receive marketing approval from the FDA and comparable foreign regulatory authorities, and we may never receive such marketing approvals.

The success of developing and commercializing our product candidates will depend on several factors, including the following:

- obtaining positive data that supports demonstration of efficacy, safety and tolerability profiles and durability of effect for our product candidates that are satisfactory to the FDA or any comparable foreign regulatory authority for marketing approval;
- successful and timely enrollment of appropriate patients for the indications included in our current and future clinical trials;
- potential variability of patient outcomes;
- the extent of any required post-marketing approval commitments to applicable regulatory authorities;
- the establishment of and maintenance of sufficient internal manufacturing capabilities;
- the maintenance of existing or the establishment of new supply arrangements with third-party drug product suppliers and manufacturers for clinical development and, if approved, commercialization of our product candidates;
- the maintenance of existing or the establishment of new scaled production arrangements with third-party manufacturers to obtain finished products that are appropriately packaged for sale;
- obtaining and maintaining patent protection, trade secret protection and regulatory exclusivity, both in the United States and internationally;
- protecting our rights in our intellectual property portfolio, including our licensed intellectual property;
- establishing sales, marketing and distribution capabilities and the successful launch of commercial sales of our product candidates if and when approved for marketing, whether alone or in collaboration with others;
- a continued acceptable safety profile following any marketing approval;
- commercial acceptance by patients, the medical community and third-party payors; and
- our ability to compete with other therapies.

We do not have complete control over many of these factors, including certain aspects of clinical development and the regulatory submission process, potential threats to our intellectual property rights and the manufacturing, marketing, distribution and sales efforts of any collaborator or licensee. For development programs that are licensed to third parties, we generally do not have control over the design or conduct of clinical trials and will not have discretion over marketing decisions. If we are not successful with respect to one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully commercialize any product candidates from our lead programs, which would materially harm our business. If we do not receive marketing approvals for such product candidates, we may not be able to continue our operations.

There are substantial risks inherent in attempting to commercialize our new drugs, and, as a result, we may not be able to successfully develop products for commercial use.

Scientific research and development requires significant amounts of capital and takes a long time to reach commercial viability if it can be achieved at all. To date, our research and development projects have not produced

commercially viable drugs and may never do so. During the research and development process, we may experience technological barriers that we may be unable to overcome. Because we use platform technology to develop drug candidates, toxicology signals that may emerge in the course of testing of one particular candidate may apply broadly across our drug candidate platform. Further, certain underlying premises in our development programs are not proven and many of the drug targets that we are pursuing have not yet been validated clinically. For instance, ARO-RAGE has demonstrated the ability to reduce the expression of RAGE in the lung, however it has not been established that this will have an anti-inflammatory effect sufficient for a meaningful clinical benefit in patients with inflammatory lung disease. Further, it is also unknown at this time what may be required to gain favorable reimbursement. With respect to fazirsiran, it is also unknown at this time what changes in the liver may be required to gain regulatory approval and/or favorable reimbursement for a drug that reduces the production of mutant alpha-1 antitrypsin in the liver. Similar uncertainties and risks exist that are specific to each of our development programs. Because of these and similar uncertainties, it is possible that no commercial products will be successfully developed. If we are unable to successfully develop commercial products, we will be unable to generate revenue or build a sustainable or profitable business.

Our product candidates are in clinical development, which is a lengthy and expensive process with uncertain outcomes and the potential for substantial delays. There can be no assurance that our product candidates will obtain regulatory approval, which is necessary before they can be commercialized.

The sale of human therapeutic products in the United States and foreign jurisdictions is subject to extensive and time-consuming regulatory approval which requires, among other things:

- controlled research and human clinical testing;
- establishment of the safety and efficacy of the product;
- government review and approval of a submission containing manufacturing, preclinical and clinical data; and
- adherence to cGMP regulations during production and storage.

Since 2011, we have focused substantially all of our efforts and financial resources on identifying, acquiring and developing our product candidates, including conducting lead optimization, nonclinical studies, preclinical studies and clinical trials, and providing general administrative support for these operations. And, the clinical-stage product candidates we currently have under development will require significant development, preclinical and clinical testing and investment of significant funds to gain regulatory approval before they can be approved for commercialization. The results of our research and human clinical testing of our products may not meet regulatory requirements. Some of our product candidates, if approved, may require the completion of post-market studies. There can be no assurance that any of our products will be further developed and approved. The process of completing clinical testing and obtaining required approvals will take several years and require the use of substantial resources. For instance, we currently plan to study plozasiran in a cardiovascular outcomes trial, and cardiovascular outcomes trials are expensive clinical trials performed in a large number of subjects over several years. Further, there can be no assurance that product candidates employing a new technology will be shown to be safe and effective in clinical trials or receive applicable regulatory approvals. If we fail to obtain regulatory approvals for any or all of our products, we will not be able to market such product and our operations may be adversely affected.

Our clinical trials may not yield successful results for the product candidates that we may identify and pursue for their intended uses, which would prevent, delay or limit the scope of regulatory approval and commercialization.

We must demonstrate our product candidates' safety and efficacy in humans for each target indication through extensive clinical testing. We may experience numerous unforeseen events during, or as a result of, the testing process that could delay or prevent commercialization of any products, including the following:

- the results of preclinical studies may be inconclusive, or they may not be indicative of results that will be obtained in human clinical trials;
- safety and efficacy results attained in early human clinical trials may not be indicative of results that are obtained in later clinical trials;
- after reviewing test results, we may abandon projects that we might previously have believed to be promising;
- we or our regulators may suspend or terminate clinical trials because the participating subjects or patients are being exposed to unacceptable health risks; and
- our product candidates may not have the desired effects or may include undesirable side effects or other characteristics that preclude regulatory approval or limit their commercial use if approved.

We cannot be certain that current clinical trials or any future clinical trials, whether conducted by us or our licensees, will be successful. Additionally, any safety concerns observed in any one of our clinical trials in our targeted indications could limit the prospects for regulatory approval of our product candidates in those and other indications, which could have

a material adverse effect on our business, financial condition and results of operation. Success in clinical trials in a particular indication does not ensure that a product candidate will be successful in other indications. Similarly, approval of a product candidate in a particular indication does not ensure that the product candidate will be successful in other indications. For instance, although plozasiran's Phase 3 PALISADE trial for patients with FCS was successful in achieving its primary endpoint and all multiplicity-controlled key secondary endpoints, and we filed an NDA with the FDA on November 16, 2024 and sought regulatory approval with additional global regulatory authorities thereafter, there can be no guarantee that the FDA or another regulatory authority approves plozasiran for the treatment of FCS, and plozasiran may not succeed in achieving its clinical trial endpoints or be approved for the treatment of larger indications such as sHTG or ASCVD because the endpoints and clinical data required for approval in a rare disease indication are different from what is required for a broader patient population. Moreover, results acceptable to support approval in one jurisdiction may be deemed inadequate by another regulatory authority to support regulatory approval in that other jurisdiction. To the extent that the results of the trials are not satisfactory to the FDA or comparable foreign regulatory authorities for support of a marketing application, we may be required to expend significant resources, which may not be available to us, to conduct additional trials in support of potential approval of our product candidates. Even if regulatory approval is secured for a product candidate, the terms of such approval may limit the scope and use of the specific product candidate, which may also limit its commercial potential.

Our clinical trials may reveal significant adverse events, toxicities or other side effects and may result in a safety profile that could inhibit regulatory approval or market acceptance of any of our product candidates.

In order to obtain marketing approval for any of our product candidates, we must demonstrate the safety and efficacy of the product candidate for the relevant clinical indication or indications through preclinical studies and clinical trials as well as additional supporting data. As is the case with pharmaceuticals generally, it is likely that there may be side effects and adverse events ("AEs") associated with the use of our products or product candidates. If our product candidates are associated with undesirable side effects in preclinical studies or clinical trials, or have unexpected characteristics, we may need to interrupt, delay or abandon their development or limit development to more narrow uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective.

If further significant adverse events or other side effects are observed in any of our current or future clinical trials, we may have difficulty recruiting patients to the clinical trials, patients may drop out of our trials, or we may be required to abandon the trials or our development efforts of that product candidate altogether. We, the FDA, the EMA, other applicable regulatory authorities or an institutional review board may suspend clinical trials of a product candidate at any time for various reasons, including a belief that subjects in such trials are being exposed to unacceptable health risks or adverse side effects. Some potential therapeutics developed in the biotechnology industry that initially showed therapeutic promise in early-stage studies have later been found to cause side effects that prevented their further development. Even if the side effects do not preclude the drug from obtaining or maintaining marketing approval, undesirable side effects may inhibit market acceptance of the approved product due to its tolerability relative to other therapies. Any of these developments could materially harm our business, financial condition and prospects.

Clinical trials of our product candidates may not uncover all possible adverse events that patients may experience.

Clinical trials are conducted in representative samples of the potential patient population, which may have significant variability. By design, clinical trials are based on a limited number of subjects and are of limited duration of exposure to the product, to determine whether the product candidate demonstrates the substantial evidence of efficacy and safety necessary to obtain regulatory approval. As with the results of any statistical sampling, we cannot be sure that all side effects of our product candidates may be uncovered. It may be the case that only with a significantly larger number of patients exposed to the product candidate for a longer duration may a more complete safety profile be identified. Further, even larger clinical trials may not identify rare significant AEs, and the duration of such studies may not be sufficient to identify when those events may occur. Other products have been approved by the regulatory authorities for which safety concerns have been uncovered following approval. Such safety concerns have led to labeling changes, restrictions on distribution through use of a REMS, or withdrawal of products from the market, and any of our product candidates may be subject to similar risks.

Although to date our current drug candidates have generally evidenced an acceptable safety profile in clinical trials, patients treated with our products, if approved, may experience previously unreported adverse reactions or minor incidences of adverse reactions may manifest with greater frequency in subsequent larger trials, and it is possible that the FDA or other regulatory authorities may ask for additional safety data as a condition of, or in connection with, our efforts to obtain approval of our product candidates. If toxicities, adverse events or any other safety problems occur or are identified after our products, if any, reach the market, we may make the decision or be required by regulatory authorities to

conduct additional clinical safety trials, amend the labeling of our products or add additional warnings to the labeling, recall our products, or even withdraw approval for our products.

Topline data may not accurately reflect the complete results of a particular study or trial.

We may publicly disclose topline or interim data from time to time, which is based on a preliminary analysis of then-available efficacy and safety data which are based on preliminary analysis of key efficacy and safety data, and the results and related findings and conclusions are subject to change following a more comprehensive review of the data related to the particular study or trial. We also make assumptions, estimations, calculations and conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data. As a result, the topline results that we report may differ from future results of the same studies, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Topline data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data we previously published. As a result, topline data should be viewed with caution until the final data are available. Further, others, including regulatory agencies, may not accept or agree with our assumptions, estimations, calculations, conclusions or analyses or may interpret or weigh the importance of data differently, which could impact the value of the particular program, the approvability or commercialization of the particular drug candidate or drug and our company in general. In addition, the information we may publicly disclose regarding a particular study or clinical trial is based on what is typically extensive information, and you or others may not agree with what we determine is the material or otherwise appropriate information to include in our disclosure, and any information we determine not to disclose may ultimately be deemed significant with respect to future decisions, conclusions, views, activities or otherwise regarding a particular drug, drug candidate or our business. If the topline data that we report differ from a future analysis of results, or if others, including regulatory authorities, disagree with the conclusions reached, our ability to obtain approval for and commercialize our product candidates, our business, operating results, prospects or financial condition may be harmed.

Results of earlier studies or clinical trials may not be predictive of future clinical trial results, and initial studies or clinical trials may not establish an adequate safety or efficacy profile for our product candidates to justify proceeding to advanced clinical trials or an application for regulatory approval.

The results of nonclinical and preclinical studies and clinical trials may not be predictive of the results of later-stage clinical trials, and interim results of clinical trials do not necessarily predict final results. The results of preclinical studies and clinical trials in one set of patients or disease indications, or from preclinical studies or clinical trials that we did not lead, may not be predictive of those obtained in another. In some instances, there can be significant variability in safety or efficacy results between different clinical trials of the same product candidate due to numerous factors, including changes in trial procedures set forth in protocols, differences in the size and type of the patient populations, changes in and adherence to the dosing regimen and other clinical trial protocols and the rate of dropout among clinical trial participants. In addition, preclinical and clinical data are often susceptible to various interpretations and analyses, and many companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy profile despite having progressed through nonclinical studies and initial clinical trials. Many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials after achieving positive results in early-stage development, or after achieving positive results in pivotal trials, and we cannot be certain that we will not face similar setbacks. Even if early-stage clinical trials are successful, we may need to conduct additional clinical trials of our product candidates in additional patient populations or under different treatment conditions before we are able to seek approvals from the FDA and regulatory authorities outside the United States to market and sell these product candidates. Our failure to obtain marketing approval for our product candidates for commercially viable indications, or at all, would substantially harm our business, prospects, financial condition and results of operations.

It may take us longer than we project to complete clinical trials, and we may not be able to complete them at all.

Although for planning purposes we project the commencement, continuation and completion of our clinical trials, a number of factors, including scheduling conflicts with participating clinicians and clinical institutions, and difficulties in identifying or enrolling patients who meet trial eligibility criteria, may cause significant delays. Enrollment of clinical trials may be particularly difficult in orphan diseases or limited-sized patient populations. The FDA or other regulatory bodies may require additional, longer or broader clinical trials to establish safety and effectiveness, notwithstanding guidance the Company may have received from those bodies during clinical trial planning and execution. Further, the cost for conducting clinical trials is significant and if our cash resources become limited we may not be able to commence, continue and/or complete our clinical trials. We may not commence or complete clinical trials involving any of our product candidates as projected or may not conduct them successfully.

We face potential product liability exposure, and if successful claims are brought against us, we may incur substantial liability for a product candidate and may have to limit its commercialization.

The use of our product candidates in clinical trials and the sale of any products for which we obtain marketing approval expose us to the risk of product liability claims. Product liability claims might be brought against us by clinical trial participants, consumers, healthcare providers, pharmaceutical companies, or others selling our products. If we cannot successfully defend ourselves against these claims, we may incur substantial liabilities. Regardless of merit or eventual outcomes of such claims, product liability claims may result in:

- decreased demand for our product candidates;
- impairment of our business reputation;
- withdrawal of clinical trial participants;
- costs of litigation;
- substantial monetary awards to patients or other claimants; and
- loss of revenues.

Our insurance coverage may not be sufficient to reimburse us for all expenses or losses we may suffer. Moreover, insurance coverage is becoming increasingly expensive and, in the future, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses.

The successful commercialization of our product candidates, if approved, will depend in part on the extent to which government authorities and health insurers establish adequate reimbursement levels and pricing policies.

Sales of any approved drug candidate will depend in part on the availability of coverage and reimbursement from third-party payers such as government insurance programs, including Medicare and Medicaid, private health insurers, health maintenance organizations and other health care related organizations, who are increasingly challenging the price of medical products and services. Accordingly, coverage and reimbursement may be uncertain. Adoption of any drug by the medical community may be limited if third-party payers will not offer adequate coverage. Additionally, significant uncertainty exists as to the reimbursement status of newly-approved drugs. Cost control initiatives may decrease coverage and payment levels for any drug and, in turn, the price that we will be able to charge and/or the volume of our sales. We are unable to predict all changes to the coverage or reimbursement methodologies that will be applied by private or government payers. Any denial of private or government payer coverage or inadequate reimbursement could harm our business and reduce our revenue. With respect to our partnered product candidates, we will be reliant on that partner to obtain reimbursement from government and private payors for the drug, if approved, and any failure of that partner to establish adequate reimbursement could have a negative impact on our revenues and profitability.

In addition, both the federal and state governments in the United States and foreign governments continue to propose and pass new legislation, regulations, and policies affecting coverage and reimbursement rates, which are designed to contain or reduce the cost of health care. Further federal and state proposals and healthcare reforms are likely, which could limit the prices that can be charged for the product candidates that we develop and may further limit our commercial opportunity. For example, the IRA includes several measures intended to lower the cost of prescription drugs and related healthcare reforms, including limits on price increases and subjecting an escalating number of drugs to annual price negotiations with CMS (The Centers for Medicare & Medicaid Services). We cannot be sure whether additional legislation or rulemaking related to the IRA will be issued or enacted, or what impact, if any, such changes will have on the profitability of any of our drug candidates, if approved for commercial use, in the future. There also may be future changes unrelated to the IRA that result in reductions in potential coverage and reimbursement levels for our product candidates, if approved and commercialized, and we cannot predict the scope of any future changes or the impact that those changes would have on our operations.

If future reimbursement for approved product candidates, if any, is substantially less than we project, or rebate obligations associated with them are substantially greater than we expect, our future net revenue and profitability could be materially diminished.

We may not enjoy the market exclusivity benefits of our orphan drug designations.

Although we may obtain orphan designations in the treatment of certain diseases our products are intended to treat, the designation may not be applicable to any particular product we might get approved and that product may not be the first product to receive approval for that indication. Under the Orphan Drug Act, the first product with an orphan designation receives market exclusivity, which prohibits the FDA from approving the “same” drug for the same indication. The FDA has stated that drugs can be the “same” even when they are not identical but has not provided guidance with respect to how it will determine “sameness” for RNAi drugs. It is possible that another RNAi drug could be approved for the treatment of a disease that one of our orphan products is intended to treat before our product is approved, which means that we may not

obtain orphan drug exclusivity and could also potentially be blocked from approval until the first product's orphan drug exclusivity period expires or we demonstrate, if we can, that our product is superior. Further, even if we obtain orphan drug exclusivity for a product, that exclusivity may not effectively protect the product from competition because different drugs can be approved for the same condition. Even after an orphan drug is approved and granted orphan drug exclusivity, the FDA can subsequently approve the same drug for the same condition if the FDA concludes that the later drug is safer, more effective or makes a major contribution to patient care. Further, orphan drug exclusivity can be lost if the FDA later determines that the request for designation was materially defective or if the applicant is unable to assure the availability of sufficient quantities of the drug to meet the needs of patients with the disease or condition for which the drug was designated.

Our success depends on the attraction and retention of senior management and scientists with relevant expertise.

Our future success depends to a significant extent on the continued services of our key employees, including our senior scientific, technical and managerial personnel. We do not maintain key person life insurance for any of our executives and we do not maintain employment agreements with many senior employees. Competition for qualified employees in the pharmaceutical industry is high, and our ability to execute our strategy will depend in part on our ability to continue to attract and retain qualified scientists, management and other employees. This will depend in part on our ability to create and maintain a desirable workplace culture, which may be impacted by employee preferences for remote working. In addition, the market for qualified employees in the pharmaceutical industry is experiencing labor shortages and inflationary pressures are causing salaries and wages to increase, all of which exacerbates these competitive dynamics. If we are unable to find, hire and retain qualified individuals, we will have difficulty implementing our business plan in a timely manner, or at all.

Our commercialization, collaborative and other arrangements may give rise to disputes over commercial terms, contract interpretation and ownership or protection of our intellectual property and may adversely affect the commercial success of our product candidates.

We have in the past and may again in the future enter into collaboration or license arrangements, including commercialization or collaborative arrangements, some of which may be based on less definitive agreements, such as memoranda of understanding, material transfer agreements, options or feasibility agreements.

Commercialization and collaborative relationships are generally complex and can give rise to disputes regarding the relative rights, obligations and revenues of the parties, including the ownership of intellectual property and associated rights and obligations, especially when the applicable collaborative provisions have not been fully negotiated and documented. Such disputes have arisen in the past from time to time and, if they arise again could delay collaborative research, development or commercialization of potential product candidates, and can lead to lengthy, expensive litigation or arbitration. The terms of such arrangements may also limit or preclude us from commercializing products or technologies developed pursuant to such collaborations. Additionally, the commercialization or collaborative partners under these arrangements might breach the terms of their respective agreements or fail to maintain, protect or prevent infringement of the licensed patents or our other intellectual property rights by third parties. Moreover, negotiating commercialization and collaborative arrangements often takes considerably longer to conclude than the parties initially anticipate, which could cause us to enter into less favorable agreement terms that delay or defer recovery of our development costs and reduce the funding available to support key programs. Any failure by our commercialization or collaborative partners to abide by the terms of their respective agreements with us (including their failure to accurately calculate, report or pay any royalties payable to either us or a third party or their failure to repay, in full or in part, either any outstanding receivables or any other amounts for which we are entitled to reimbursement) may adversely affect our results of operations.

We are not always able to enter into commercialization or collaborative arrangements on acceptable terms, which can harm our ability to develop and commercialize our current and potential future products and technologies. Other factors relating to collaborations that may adversely affect the commercial success of our product candidates include:

- any parallel development by a commercialization or collaborative partner of competitive technologies or products;
- arrangements with commercialization or collaborative partners that limit or preclude us from developing products or technologies;
- premature termination of a commercialization or collaboration agreement or the inability to renegotiate existing agreements on favorable terms; or
- failure by a commercialization or collaborative partner to devote sufficient resources to the development and commercial sales of products using our current and potential future products and technologies.

Our commercialization or collaborative arrangements do not necessarily restrict our commercialization or collaborative partners from competing with us or restrict their ability to market or sell competitive products. Our current and any future commercialization or collaborative partners may pursue existing or other development-stage products or alternative technologies in preference to those being commercialized or developed in collaboration with us.

In addition, contract disputes with customers or other third parties may arise from time to time. Our commercialization or collaborative partners, or customers or other third parties, may also terminate their relationships with us or otherwise decide not to proceed with the development, commercialization or purchase of our product candidates.

Risks Related to Regulatory Review and Approval of Our Product Candidates

Breakthrough Therapy designation for Plozasiran and/or Fazirsiran (formerly ARO-AAT) may not lead to a faster development or review process.

We have been granted a Breakthrough Therapy designation for plozasiran in the United States for the treatment of FCS and fazirsiran in the United States for the treatment of liver disease associated with AATD. Breakthrough Therapy designation is intended to facilitate the development and expedite the review of new therapies to treat serious conditions with unmet medical needs by providing sponsors with the opportunity for frequent interactions and additional drug development guidance with the FDA and its senior managers. Breakthrough Therapy designation applies to the combination of the drug candidate and the specific indication for which it is being studied. Product candidates that receive Breakthrough Therapy designation may receive more frequent interactions with the FDA regarding the product candidate's development plan and clinical trials and may be eligible for the FDA's Rolling Review.

Despite receiving Breakthrough Therapy designation, plozasiran and/or fazirsiran may not actually benefit from faster clinical development or regulatory review or approval any sooner than other product candidates that do not have such designation, or at all. Furthermore, such a designation does not increase the likelihood that plozasiran or fazirsiran will receive marketing approval in the United States. The FDA may also rescind Breakthrough Therapy designation if it determines that plozasiran or fazirsiran no longer meets the relevant criteria.

A Fast Track product designation may not lead to faster development or regulatory review or approval process, and it does not increase the likelihood that our product candidates will receive marketing approval.

We have received a Fast Track product designation for plozasiran in the United States for the treatment of FCS, and we may seek Fast Track designation for other of our current or future product candidates. The Fast Track designation is a program offered by the FDA designed to facilitate drug development and to expedite the review of new drugs that are intended to treat serious or life-threatening conditions. Compounds selected must demonstrate the potential to address unmet medical needs. The FDA's Fast Track designation allows for close and frequent interaction with the FDA. A designated Fast Track drug may also be considered for priority review with a shortened review time, rolling submission, and accelerated approval if applicable.

A Fast Track designation does not, however, guarantee FDA approval or expedited approval of any application for the product candidate. The receipt of such a designation for a product candidate may not result in a faster development process, review, or approval compared to drugs considered for approval under conventional FDA procedures and does not assure ultimate marketing approval by the FDA. In addition, the FDA may later decide that the products no longer meet the designation conditions.

We intend to deliver some of our product candidates via drug delivery devices that will have their own regulatory, development, supply and other risks.

We intend to deliver some of our product candidates via drug delivery devices, such as an autoinjector or nebulizer. There may be unforeseen technical complications related to the development activities required to bring such a product to market, including container compatibility and/or dose volume requirements. If our product candidates are intended to be used with drug delivery devices, we expect to utilize drug delivery devices authorized for marketing under clearances of approvals held by third parties. Our product candidates may not be approved or may be substantially delayed in receiving approval if the devices do not gain and/or maintain their own regulatory approvals or clearances. Where approval of the drug product and device is sought under a single application, the increased complexity of the review process may delay approval. In addition, some drug delivery devices are provided by single-source unaffiliated third-party companies. We may be dependent on the sustained cooperation and effort of those third-party companies both to supply the devices and, in some cases, to conduct the studies required for approval or other regulatory clearance of the devices. Even if approval is obtained for our products, we may also be dependent on those third-party companies continuing to maintain such approvals or clearances, if required, for their drug delivery devices once they have been received. Failure of third-party companies to supply the devices, to successfully complete studies on the devices in a timely manner, or to obtain or maintain required approvals or clearances of the devices could result in increased development costs, delays in or failure to obtain regulatory

approval and delays in product candidates reaching the market or in gaining approval or clearance for expanded labels for new indications.

We and our licensees conduct clinical trials for product candidates outside the United States, and the FDA and comparable foreign regulatory authorities may not accept data from such trials.

We and our licensees currently conduct clinical trials outside the United States. The acceptance by the FDA or comparable foreign regulatory authority of study data from clinical trials conducted outside the United States or another jurisdiction may be subject to certain conditions or may not be accepted at all. In cases where data from foreign clinical trials are intended to serve as the basis for marketing approval in the United States, the FDA will generally not approve the application on the basis of foreign data alone unless (i) the data are applicable to the U.S. population and U.S. medical practice; (ii) the trials were performed by clinical investigators of recognized competence and pursuant to GCP regulations; and (iii) the data may be considered valid without the need for an on-site inspection by the FDA or, if the FDA considers such as inspection to be necessary, the FDA is able to validate the data through an on-site inspection or other appropriate means. Additionally, the FDA's clinical trial requirements, including sufficient size of patient populations and statistical powering, must be met. Many foreign regulatory authorities have similar approval requirements. In addition, such foreign trials would be subject to the applicable local laws of the foreign jurisdictions where the trials are conducted. There can be no assurance that the FDA or any comparable foreign regulatory authority will accept data from trials conducted outside of the United States or the applicable jurisdiction. Most of our clinical trials involve study subjects outside of the United States, including most of our phase 1 clinical trials (which often enroll study subjects in Australia and New Zealand), and our Phase 3 clinical trials of plozasiran, for which we have enrolled (with respect to FCS and sHTG) and plan to enroll (with respect to ASCVD) cohorts outside the United States. If the FDA or any comparable foreign regulatory authority does not accept such data, it would result in the need for additional trials, which would be costly and time-consuming and delay aspects of our business plan, and which may result in product candidates that we may develop not receiving approval or clearance for commercialization in the applicable jurisdiction.

Even if we obtain FDA approval for products in the United States, we may never obtain approval to commercialize any product candidates outside of the United States, which would limit our ability to realize their full market potential.

In order to market any products outside of the United States, we must establish and comply with numerous and varying regulatory requirements of other countries regarding safety and effectiveness. Clinical trials conducted in one country may not be accepted by regulatory authorities in other countries, and regulatory approval in one country does not mean that regulatory approval will be obtained in any other country. Approval processes vary among countries and can involve additional product testing and validation and additional or different administrative review periods from those in the United States, including additional preclinical studies or clinical trials. In many jurisdictions outside the United States, a product candidate must be approved for reimbursement before it can be approved for sale in that jurisdiction. In some cases, the price that we intend to charge for our products is also subject to approval before a product can be marketed in that jurisdiction, even after establishing safety and efficacy in a clinical setting.

Seeking foreign regulatory approval could result in difficulties and costs and require additional nonclinical studies or clinical trials which could be costly and time-consuming. Regulatory requirements can vary widely from country to country and could delay or prevent the introduction of our product candidates in those countries. The foreign regulatory approval process may include all of the risks associated with obtaining FDA approval. We do not have any product candidates approved for sale in international markets, and we do not have experience in obtaining regulatory approval in international markets. If we fail to comply with regulatory requirements in international markets or to obtain and maintain required approvals, or if regulatory approval in international markets is delayed, our target market will be reduced and our ability to realize the full market potential of our products will be harmed.

Even if our product candidates are approved for commercialization, failure to comply with regulatory requirements or unanticipated problems with our products may result in various adverse actions such as the suspension or withdrawal of one or more of our products, closure of a facility or enforcement of substantial penalties or fines.

If regulatory approval to sell any of our product candidates is received, regulatory agencies will subject any marketed product(s) and the facilities where they are manufactured to continual review and periodic inspection. If previously unknown problems with a product, manufacturing and laboratory facilities or regulatory requirements are discovered, such as adverse events of unanticipated severity or frequency, problems with a manufacturing process or laboratory facility, or failure to comply with applicable regulatory approval requirements, a regulatory agency may impose restrictions or penalties on that product or on us. Such restrictions or penalties may include, among other things:

- restrictions on the marketing or manufacturing of the product, the withdrawal of the product from the market or product recalls;
- warning, untitled, or it has come to our attention letters, or holds on clinical trials;

- refusal by the FDA to approve pending applications or supplements to approved applications filed by us or suspension or revocation of approvals;
- product seizure or detention, or refusal to permit the import or export of our product candidates; and
- closure of the facility, enforcement of substantial fines, injunctions, or the imposition of civil or criminal penalties.

Pharmaceutical and biological product marketing is subject to substantial regulation in the U.S. and any failure by us or our commercial and collaborative partners to comply with applicable statutes or regulations can adversely affect our business.

Any marketing activities associated with our product candidates, if approved for commercialization, will be subject to numerous federal and state laws governing the marketing and promotion of pharmaceutical and biological products. The FDA regulates post-approval promotional labeling and advertising to ensure that they conform to statutory and regulatory requirements. In addition to FDA restrictions, the marketing of prescription drugs is subject to laws and regulations prohibiting fraud and abuse under government healthcare programs. Similarly, many states have similar statutes or regulations that apply to items and services reimbursed under Medicaid and other state programs, and, in some states, such statutes or regulations apply regardless of the payor. In addition, government authorities may also seek to hold us responsible for any failure of our commercialization or collaborative partners to comply with applicable statutes or regulations. If we, or our commercial or collaborative partners, fail to comply with applicable FDA regulations or other laws or regulations relating to the marketing of our product candidates, if approved for commercialization, we could be subject to criminal prosecution, civil penalties, seizure of products, injunctions and exclusion of our product candidates from reimbursement under government programs, as well as other regulatory or investigatory actions against our future product candidates, our commercial or collaborative partners or us. See also "*Our operations, including our relationships with healthcare providers, physicians and third-party payers, are subject to applicable anti-kickback, fraud and abuse, and other healthcare laws and regulations, which, in the event of a violation, exposes us to liability for criminal sanctions, civil penalties, and contractual damages, and reputational harm and diminished profits and future earnings.*"

Risks Related to Our Intellectual Property

Our ability to protect our patents and other proprietary rights is uncertain, exposing us to the possible loss of competitive advantage.

We have licensed rights to patents and have filed and expect to continue to file patent applications. Researchers sponsored by us may also file patent applications that we may need to license. Such patent applications may not be available for licensing or may not be economically feasible to license. Certain of our patents may not be granted or may not contain claims of the necessary breadth because, for example, prior patents exist. If a particular patent is not granted, the value of the invention described in the patent would be diminished. Further, even if these patents are granted, they may be difficult to enforce. Even if ultimately successful, efforts to enforce our patent rights could be expensive, distracting for management, cause our patents to be invalidated or held unenforceable, and thus frustrate commercialization of products. Even if patents are issued and are enforceable, others may develop similar, superior or parallel technologies to any technology developed by us and not infringe on our patents. Our technology may prove to infringe upon patents or rights owned by others. Patent prosecution and maintenance is expensive, and we may be forced to curtail prosecution or maintenance if our cash resources are limited. Thus, the patents held by or licensed to us may not afford us any meaningful competitive advantage. In addition, the laws of some foreign countries in which we do business, including through our joint ventures, do not protect intellectual property rights to the same extent or in the same manner as the laws of the United States. Moreover, if we or our licensors fail to maintain the patents and patent applications covering our product candidates or technologies, including as a result of geopolitical events such as civil or political unrest (including the ongoing conflicts between Ukraine and Russia and Israel and Palestine), we may not be able to use such patents and patent applications or stop a competitor from marketing products that are the same as or similar to our product candidates. As a result, we may encounter significant problems in protecting and defending our intellectual property both in the United States and abroad. If we are unable to adequately protect our owned intellectual property or derive sufficient value from our licensed or owned intellectual property, the value of your investment may decline.

In addition, patent grant standards by the USPTO and its foreign counterparts are not always uniform or predictable, and subject to change. For example, the America Invents Act enacted a number of changes to U.S. patent laws, which may prevent us from adequately protecting our inventions and discoveries, including our ability to seek injunctive relief, pursue infringement claims, and obtain substantial damage awards. An example of a major provision of the America Invents Act is the change in the U.S. patent policy from a first-to-invent to a first-to-file practice. Additionally, the USPTO and patent offices in other jurisdictions have often required that patent applications directed to pharmaceutical and/or biotechnology-related inventions be limited or narrowed substantially to cover only the specific innovations exemplified in the patent application, thereby limiting the scope of protection against competitive challenges. Accordingly, even if we or our

licensors are able to obtain patents, the patents might be substantially narrower than anticipated. Thus, there is no assurance as to the degree and range of protections any of our patents, if issued, may afford us or whether patents will be issues. Foreign counterparts to this law are also not uniform, and there is no worldwide policy governing the subject matter and scope of claims granted in a pharmaceutical or biotechnology patent. Uncertainty, arising from changing laws, can impact our ability to protect our patents and other proprietary rights.

We are party to technology license agreements with third parties that require us to satisfy obligations to keep them effective and, if these agreements are terminated, our technology and our business could be seriously and adversely affected.

We are party to license agreements to incorporate third-party proprietary technologies into our drug products under development or our manufacturing processes. These license agreements require us to pay royalties and satisfy other conditions. If we fail to satisfy our obligations under these agreements, the terms of the licenses may be materially modified, such as by rendering currently exclusive licenses non-exclusive, or may give our licensors the right to terminate their respective agreement with us, which could limit our ability to implement our current business plan and harm our business and financial condition.

We may be subject to patent infringement claims, which could result in substantial costs and liability and prevent us from commercializing our potential products.

Because the intellectual property landscape in the fields in which we participate is rapidly evolving and interdisciplinary, it is difficult to conclusively assess our freedom to operate without infringing on third-party rights. However, if granted marketing approval, we are currently aware of certain patent rights held by third parties that, if found to be valid and enforceable, could be alleged to render one or more of our drug candidates infringing. If a claim should be brought and is successful, we may be required to pay substantial damages, be forced to abandon any affected drug candidates and/or seek a license from the patent holder. In addition, any patent infringement claims brought against us, whether or not successful, may cause us to incur significant expenses and divert the attention of our management and key personnel from other business concerns. These could negatively affect our results of operations and prospects. We cannot be certain that patents owned or licensed by us will not be challenged, potentially successfully, by others.

In addition, if our product candidates are found to infringe the intellectual property rights of third parties, these third parties may assert infringement claims against our customers, licensees and other parties with whom we have business relationships, and we may be required to indemnify those parties for any damages they suffer as a result of these claims. The claims may require us to initiate or defend protracted and costly litigation on behalf of customers, licensees, and other parties regardless of the merits of these claims. If any of these claims succeed, we may be forced to pay damages on behalf of those parties or may be required to obtain licenses for the products they use. If we cannot obtain all necessary licenses on commercially reasonable terms, we may be unable to continue selling such products.

We license patent rights from third-party owners and we rely on such owners to obtain, maintain and enforce the patents underlying such licenses.

We are a party to a number of licenses that give us rights to third-party intellectual property that is necessary or useful for our business. We also expect to enter into additional licenses to third-party intellectual property in the future.

Our success may depend in part on the ability of our licensors to obtain, maintain and enforce patent protection for our licensed intellectual property, in particular, those patents to which we have secured exclusive rights. Our licensors may not successfully prosecute the patent applications to which we are licensed. Even if patents are issued in respect of these patent applications, our licensors may fail to maintain these patents, may determine not to pursue litigation against other companies that are infringing these patents, or may pursue such litigation less aggressively than we would. Without protection for the intellectual property we license, other companies might be able to offer substantially identical products for sale, which could adversely affect our competitive business position and harm our business prospects.

Our technology licensed from various third parties may be subject to retained rights.

Our licensors often retain certain rights under their agreements with us, including the right to use the underlying technology for noncommercial academic and research use, to publish general scientific findings from research related to the technology, and to make customary scientific and scholarly disclosures of information relating to the technology. It is difficult to monitor whether our licensors limit their use of the technology to these uses, and we could incur substantial expenses to enforce our rights to our licensed technology in the event of misuse.

Confidentiality agreements with employees and others may not adequately prevent disclosure of trade secrets and other proprietary information.

In order to protect our proprietary technology and processes, we rely in part on confidentiality agreements with our collaborators, employees, consultants, outside scientific collaborators and sponsored researchers, and other advisors. These agreements may not effectively prevent disclosure of confidential information and may not provide an adequate remedy in the event of unauthorized disclosure of confidential information. As our organization grows, so does the risk of unauthorized disclosure of confidential information. In addition, while we undertake efforts to protect our trade secrets and other confidential information from disclosure, others may independently discover trade secrets and proprietary information, and in such cases, we may not be able to assert any trade secret rights against such party. Enforcing a claim that a party illegally obtained and is using our trade secrets is challenging and the outcome is unpredictable. In addition, courts outside of the U.S. may be less willing to protect trade secrets. Costly and time-consuming litigation could be necessary to enforce and determine the scope of our proprietary rights, and failure to obtain or maintain trade secret protection could adversely affect our competitive business position.

We may not be able to effectively secure first-tier technologies when competing against other companies or investors.

Our future success may require that we acquire patent rights and know-how to new or complimentary technologies. However, we also compete with a substantial number of other companies that are working to develop novel drugs using technology that compete directly with us. We are aware of several other companies that are working to develop RNAi therapeutic products and any one of these companies may develop its RNAi technology more rapidly and more effectively than us may also compete for technologies we desire. In addition, many venture capital firms and other institutional investors, as well as other pharmaceutical and biotech companies, invest in companies seeking to commercialize various types of emerging technologies. Many of these companies have greater financial, scientific and commercial resources than us. Therefore, we may not be able to secure the technologies we desire or to otherwise effectively compete. Furthermore, should any commercial undertaking by us prove to be successful, there can be no assurance competitors with greater financial resources will not offer competitive products and/or technologies.

We may not be able to protect our intellectual property rights throughout the world, which could negatively impact our business.

Filing, prosecuting and defending patents covering our current and any future product candidates in all countries throughout the world would be prohibitively expensive. Competitors may use our technologies in jurisdictions where we or our licensors have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we may obtain patent protection but where patent enforcement is not as strong as that in the United States. These products may compete with our products in jurisdictions where we do not have any issued or licensed patents, and any future patent claims or other intellectual property rights may not be effective or sufficient to prevent them from competing. Issued patents may be challenged by third parties in the courts or patent offices in various countries throughout the world. Invalidation proceedings may result in patent claims being narrowed, invalidated or held unenforceable. Uncertainties regarding the outcome of such proceedings, as well as any resulting losses of patent protection, could harm our business.

Many countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. Some countries do not enforce patents related to medical treatments, or limit enforceability in the case of a public emergency. In addition, many countries limit the enforceability of patents against government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of such patent. If we or any of our licensors is forced to grant a license to third parties with respect to any patents relevant to our business, our competitive position may be impaired, and our business, financial condition, results of operations and prospects may be adversely affected.

The intellectual property systems in other countries can be destabilized or unpredictable as a result of geopolitical events such as civil or political unrest (including the ongoing conflicts between Ukraine and Russia and Israel and Palestine). Therefore, during such geopolitical events, the ability to obtain, retain and enforce intellectual property protection in the affected countries may be uncertain and evolve during the course of such geopolitical event. The U.S. government's response to geopolitical events may also negatively affect our ability to obtain, retain and enforce intellectual property protection in the affected countries. Uncertainties regarding geopolitical events, as well as any resulting losses of intellectual property protection, could harm our business.

Risks Related to Our Business Model

Our business model assumes we will generate revenue by, among other activities, marketing or out-licensing the products we develop. Our drug candidates are in various stages of development and we have no approved products based on RNA interference and our delivery technologies. Accordingly, there is a limited amount of information about us upon which you can evaluate our business and prospects.

We have no approved drugs and thus have not begun to market or generate revenues from the commercialization of any product candidates. Because no drug candidates generated with our product platform have been approved, we have not yet demonstrated an ability to successfully overcome many of the risks and uncertainties frequently encountered by companies in new and rapidly evolving fields, particularly in the biopharmaceutical area. For example, to execute our business plan, we will need to successfully:

- Execute product development activities using technologies that have not yet generated an approved product;
- Build, maintain, and protect a strong intellectual property portfolio;
- Demonstrate safety and efficacy of our drug candidates in multiple human clinical studies;
- Receive FDA approval and approval from similar foreign regulatory bodies;
- Gain market acceptance for the development and commercialization of any drugs we develop;
- Ensure our products are reimbursed by commercial and/or government payors at a rate that permits commercial viability;
- Develop and maintain successful strategic relationships with suppliers, distributors, and commercial licensing partners;
- Manage our spending and cash requirements as our expenses will increase in the near term if we add programs and additional preclinical and clinical trials; and
- Effectively market any products for which we obtain marketing approval.

If we are unsuccessful in accomplishing these objectives, we may not be able to develop products, raise capital, expand our business or continue our operations.

We may need to establish additional relationships with strategic and development partners to fully develop our drug candidates and market any approved products.

Over the past several years we have entered into license and collaboration agreements with Takeda, Janssen, Amgen, Horizon, GSK and Visirna. Our business strategy includes securing additional collaborations with other pharmaceutical and biotech companies to support the development of our RNAi therapeutics and other drug candidates. We do not possess all of the financial and development resources necessary to develop and commercialize all of the products that may result from our technologies. Unless we expand our own product development capacity and enhance our own internal marketing capability, we may need to make arrangements with other strategic partners to develop and commercialize any drug candidates that may be approved. We may not be able to attract such partners, and even if we are able to enter into such partnerships, the terms may be less favorable than anticipated. Further, entering into partnership agreements may limit our commercialization options and/or require us to share revenues and profits with our partners. If we do not find appropriate partners, or if our existing arrangements or future agreements are not successful, our ability to develop and commercialize products could be adversely affected. Even if we are able to find collaborative partners, the overall success of the development and commercialization of product candidates in those programs will depend largely on the efforts of other parties and will be beyond our control, particularly as partnered programs progress and our licensees may elect to assume greater control over these programs. In addition, in the event we pursue our commercialization strategy through collaboration or licenses to third parties, there are a variety of technical, business and legal risks, including:

- We may not be able to control the amount and timing of resources that our collaborators may be willing or able to devote to the development or commercialization of our drug candidates or to their marketing and distribution; and
- Disputes may arise between us and our collaborators that result in the delay or termination of the research, development or commercialization of our drug candidates or that result in costly litigation or arbitration that diverts our management's resources.

The occurrence of any of the above events or other related events could impair our ability to generate revenues and harm our business and financial condition.

Our ability to generate milestone and royalty payments under our current and potential future licensing and collaboration agreements is substantially controlled by our partners, and as such, we will likely need other sources of financing to continue to develop our internal drug candidates.

Under our licensing and collaboration agreements with Amgen, Takeda, GSK and Visirna, our partners substantially control clinical development and commercialization for all of the candidates covered under those agreements in their relevant territories. To the extent that (i) our partners' interests in advancing these candidates or targets changes, (ii) unforeseen scientific issues with the candidates arise, or (iii) the pace at which our partners move the candidates through clinical trials toward commercialization slows, our ability to collect milestones and royalties may be significantly diminished. This would further cause us to rely upon other sources of financing to continue to develop our other internal drug candidates.

We may lose a considerable amount of control over our intellectual property and may not receive anticipated revenues in strategic transactions, particularly where the consideration is contingent on the achievement of development or sales milestones.

Our business model has been to develop new technologies and to utilize the intellectual property created through the research and development process to develop commercially successful products. If the acquirers of our technologies fail to achieve performance milestones, we may not receive a significant portion of the total value of any sale, license or other strategic transaction.

We will need to achieve commercial acceptance of our drug candidates to generate revenues and achieve profitability.

Even if our research and development efforts yield technologically feasible applications, we may not successfully develop commercial products. Drug development takes years of study in human clinical trials prior to regulatory approval, and, even if we are successful in getting regulatory approval of our drug candidates, it may not be on a timely basis. During our drug development period, superior competitive technologies may be introduced which could diminish or extinguish the potential commercial uses for our drug candidates. Additionally, the degree to which the medical community and consumers will adopt any product we develop is uncertain. The rate and degree of market acceptance of our products will depend on a number of factors, including the establishment and demonstration in the medical community of the clinical efficacy and safety of our products, their potential advantage over alternative treatments, and the costs to patients and third-party payors, including insurance companies and Medicare. Recent efforts in the United States and abroad to reduce overall healthcare spending has put significant pressure on the price of prescription drugs and certain companies have been publicly criticized for the relatively high cost of their therapies. These pressures may force us to sell any approved drugs at a lower price than we or analysts may anticipate or may result in lower levels of reimbursement and coverage from third parties.

Moreover, as no drug candidates generated with our product platform has been approved for commercialization, we have not generated any revenue from product sales. Our ability to generate significant revenue and achieve profitability depends on our ability, alone or with potential strategic collaboration partners, to complete the development of and obtain the regulatory and marketing approvals necessary to commercialize our drug candidates and introduce products that will be accepted by the medical community. The commercial success of our products, if approved, will depend on many factors, including, but not limited to:

- the availability of coverage and adequate and timely reimbursement from managed care plans, private insurers, government payors (such as Medicare and Medicaid and similar foreign authorities) and other third-party payors for our products;
- patients' ability and willingness to pay out-of-pocket for our products in the absence of coverage and/or adequate reimbursement from third-party payors;
- patient demand for our products;
- our ability to establish and enforce intellectual property rights in and to our products; and
- our ability to avoid third-party patent interference, intellectual property challenges or intellectual property infringement claims.

We cannot predict whether significant commercial market acceptance for our products, if approved, will ever develop, and we cannot reliably estimate the projected size of any such potential market. Our revenue growth and achievement of consistent profitability will depend substantially on our ability to introduce products that will be accepted by the medical community. If we are unable to cost-effectively achieve acceptance of our technology among the medical establishment and patients, or if the associated products do not achieve wide market acceptance, our business will be materially and adversely affected.

If the market opportunities for our approved product candidates, if any, are smaller than we expect, it could materially adversely affect our financial condition and results of operation.

If the market opportunity for our products, if approved, is smaller than we expect, we may never become or remain profitable nor generate sufficient revenue growth to sustain our business even if we obtain significant market share for them. The potentially addressable patient population for our products may be limited or may not be amenable to treatment with our products, and new patients may become increasingly difficult to identify or access, which would adversely affect our results of operations and our business.

We rely on outside sources for various components and processes for our products.

We rely on third parties for various components and processes for our product candidates. We may not be able to achieve multiple sourcing because there may be no acceptable second source, other companies may choose not to work with us, or the component or process sought may be so new that a second source does not exist or does not exist on acceptable terms. For instance, many of our pulmonary drug candidates are administered using a proprietary delivery device which can only be sourced from a single manufacturer. There may be a disruption or delay in the performance of our third-party contractors, suppliers or collaborators which is beyond our control. If such third parties are unable to satisfy their commitments to us, the development of our products would be adversely affected. Therefore, it is possible that our development plans will have to be slowed down or stopped completely at times due to our inability to obtain required raw materials, components, and outsourced processes at an acceptable cost, if at all, or to get a timely response from vendors, particularly as a result of recent labor market and global supply chain constraints.

We have limited manufacturing capability and must rely on third-party manufacturers to manufacture our clinical supplies and commercial products, if and when approved, and if they fail to meet their obligations, the development and commercialization of our products could be adversely affected.

Although we have developed our own internal manufacturing capabilities which allow us to manufacture oligonucleotide drug substance for our clinical product candidates, we do not currently have internal manufacturing capabilities beyond such clinical-stage oligonucleotide drug substance. We rely, and expect to continue to rely, on third-party manufacturers for the production of our drug product candidates for clinical trials and potential future commercialization. We may choose to utilize third-party manufacturers to produce some or all of our development candidates, even if we have internal manufacturing capabilities to do so. Further, we have not developed the ability to manufacture drug product ourselves, nor have we developed the capabilities to manufacture biologics. If we were to experience an unexpected loss or interruption of supply for any of our product candidates, whether as a result of manufacturing, supply or storage issues or otherwise, we could experience delays, disruptions, suspensions or terminations of, or be required to restart or repeat, any pending or ongoing clinical trials. Further, our drug candidates are composed of multiple components and require specific formulations for which scale-up and manufacturing could be difficult. For certain products, we have limited experience in such scale-up and manufacturing which may require us to depend on a limited number of third parties, who may not be able to deliver in a timely manner, or at all. In order to develop products, apply for regulatory approvals, and commercialize our products, we will need to develop, contract for, or otherwise arrange for the necessary manufacturing capabilities. We anticipate an increase in our GMP drug substance manufacturing capacity following the successful completion and integration of our manufacturing facility in Verona, Wisconsin. There are a limited number of manufacturers that supply synthetic oligonucleotides. There are risks inherent in pharmaceutical manufacturing that could affect the ability of our contract manufacturers to meet our delivery time requirements or provide adequate amounts of material to meet our needs. Included in these risks are synthesis and purification failures and contamination during the manufacturing process, which could result in unusable product and cause delays in our development process, as well as additional expense to us.

Additionally, if any of our product candidates become approved for commercial sale, we will need to establish either internal or third-party manufacturing and analytic capacity. For example, while we are still seeking regulatory approval, we intend to enter into third-party agreements for the manufacturing of plozasiran, in anticipation of a commercial launch in 2025. Further, some manufacturing partners may require us to fund capital improvements, perhaps on behalf of third parties, to support the scale-up of manufacturing and related activities. We may not be able to establish scaled manufacturing capacity for an approved product in a timely or economic manner, if at all. If we or our third-party manufacturers are unable to provide commercial quantities of such an approved product, we will have to successfully transfer manufacturing technology to a different or additional manufacturer. Engaging a new manufacturer for such an approved product could require us to conduct comparative studies or utilize other means to determine bioequivalence of the new and prior manufacturers' products, which could delay or prevent our ability to commercialize such an approved product. If we or any of these manufacturers is unable or unwilling to increase its manufacturing capacity or if we are unable to establish alternative arrangements on a timely basis or on acceptable terms, the development and commercialization of such an approved product may be delayed or there may be a shortage in supply. Any inability to

manufacture our product candidates or future approved drugs in sufficient quantities when needed would seriously harm our business. While we are exploring alternative suppliers for certain critical materials, there can be no assurance that our efforts will be successful.

If any of our drug candidates is approved by a regulatory authority, manufacturers of our approved products (including us, if we chose to internally manufacture) must comply with cGMP requirements relating to methods, facilities and controls used in the manufacturing, processing and packaging of the product, which are intended to ensure that drug products are safe and that they consistently meet applicable requirements and specifications. These requirements include quality control, quality assurance, and the maintenance of records and documentation. These manufacturers (including us, if we chose to internally manufacture) may be unable to comply with these cGMP requirements and with other FDA, state and foreign regulatory requirements. These requirements are enforced by the FDA and other health authorities through periodic announced and unannounced inspections of manufacturing facilities. A failure to comply with these requirements or to provide adequate and timely corrective actions in response to deficiencies identified in an inspection may result in enforcement action, including warning letters, fines and civil penalties, suspension of production, suspension or delay in product approval, product seizure or recall, plant shutdown, or the delay, withholding, or withdrawal of product approval. If the safety of any quantities supplied is compromised due to a manufacturer's failure to adhere to applicable laws or for other reasons, we may not be able to obtain regulatory approval for or successfully commercialize our products, which would seriously harm our business.

We rely on third parties to conduct our clinical trials, and if they fail to fulfill their obligations, the development of our products may be adversely affected.

We rely on independent clinical investigators, contract research organizations (CROs) and other third-party service providers to assist us in managing, monitoring and otherwise carrying out our clinical trials. We contract with certain third-parties to provide certain services, including site selection, enrollment, monitoring and data management services. We rely on these parties to carry out our clinical trials in compliance with GCP and other relevant requirements. Although we depend heavily on these parties, we do not control them and therefore we cannot be assured that these third parties will adequately perform all of their contractual obligations to us. If our third-party service providers cannot adequately and timely fulfill their obligations to us, or if the quality and accuracy of our clinical trial data is compromised due to failure by such third parties to adhere to our protocols, GCP, or other regulatory requirements or if such third parties otherwise fail to meet deadlines or quality requirements, our development plans may be delayed or terminated. Further, if clinical study results are compromised, then we may need to repeat the affected studies, which could result in significant additional costs and delays to us.

We face competition from various entities including large pharmaceutical companies, small biotech companies, private companies, and research institutions.

Many of our competitors have greater financial resources and may have more experience in research and development, manufacturing, managing clinical trials and/or regulatory compliance than we do. Our competitors may compete with us for lead clinical trial investigators, clinical trial site locations and patient enrollment. These competitors may also compete with us on recruiting scientific and management personnel. Because our products are in various stages of preclinical and clinical development, along with many of the competing products, and given unpredictability inherent in drug development, it is difficult to predict which third parties may provide the most competition, and on what specific basis that competition may be based.

We may have difficulty expanding our operations successfully as we evolve our pipeline and move toward commercializing drugs.

Our future financial performance and our ability to commercialize products and compete effectively will depend, in part, on our ability to effectively manage future growth. We expect that as we increase the number of product candidates we are developing we will also need to expand our operations. This expected growth may place a strain on our administrative and operational infrastructure and information technology systems. As product candidates we develop enter and advance through clinical trials, we will need to expand our development, regulatory, manufacturing, marketing, and sales capabilities or contract with other organizations to provide these capabilities for us. We are currently establishing a sales and marketing infrastructure, and although we have hired individuals with significant experience in the sales, marketing, or distribution of pharmaceutical products, we have never done so as a company. To achieve commercial success for any approved product for which we retain sales and marketing rights, we must continue to develop a sales and marketing organization or outsource these functions to third parties. If we or our collaborators are unable to establish sales, marketing and distribution capabilities or enter into or maintain agreements with third parties to market and sell our product candidates, we may not be successful in commercializing our product candidates if and when they are approved. Further, as our operations expand due to our development progress, we expect that we will need to manage additional relationships with various collaborators, suppliers, and other organizations. Our ability to manage our operations and future growth will

require us to continue to improve our operational, financial, information technology and management controls, reporting systems and procedures. We may not be able to effectively manage the expansion of our operations or implement improvements to our management information and control systems in an efficient or timely manner and may discover deficiencies in existing systems and controls.

Our business and operations could suffer in the event of a cybersecurity incident or other information technology system failures.

Our internal computer systems and those of our contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, ransomware and other cyber-attacks, human error, natural disasters, terrorism, war, and telecommunication and electrical failures. Such events could cause interruption of our operations and loss of intellectual property. For example, the loss of preclinical trial data or data from completed or ongoing clinical trials for our product candidates could result in delays in our regulatory filings and development efforts and significantly increase our costs. Further, cybersecurity breaches or other cybersecurity incidents may allow hackers access to our preclinical compounds, strategies, discoveries, trade secrets, and/or other confidential information. Additionally, sensitive data could be leaked, disclosed, or revealed as a result of or in connection with our employees', personnel's, vendors' or partners' use of generative AI technologies. To the extent that any disruption or cybersecurity incident were to result in a loss of or damage to our data, or inappropriate disclosure of confidential, proprietary or private information, we could incur liability or regulatory penalties, including under laws and regulations governing the protection of protected health information and other personal data, we could lose valuable trade secret rights, the development of our product candidates could be delayed, and we could suffer reputational damage and damage to key business relationships. The risk of a cybersecurity incident or other informational technology disruption, particularly through cyber-attacks, has generally increased as the number, intensity and sophistication of attempted attacks and intrusions from around the world have increased. We, and certain of the third parties for which we depend on to operate our business, have experienced cyber-security attacks in the past, which to date have not had a material impact on our operations or development programs; however; there is no assurance that such impacts will not be material in the future.

Because we use biological materials, hazardous materials, chemicals and radioactive compounds, if we do not comply with laws regulating the protection of the environment and health and human safety, our business could be adversely affected.

Our research, development and manufacturing activities involve the use of potentially harmful biological materials as well as materials, chemicals and various radioactive compounds that could be hazardous to human health and safety or the environment. We store most of these materials and various wastes resulting from their use at our facilities in Madison, Wisconsin, Verona, Wisconsin, and San Diego, California pending ultimate use and disposal. We cannot completely eliminate the risk of contamination, which could cause interruption to our research and development and manufacturing efforts, injury to our employees and others, environmental damage, and liabilities under federal, state and local law. In such an event, we may be held liable for any resulting damages, and any liability could exceed our resources. Although we carry insurance in amounts and types that we consider commercially reasonable, we do not have insurance coverage for losses relating to an interruption of our research, development or manufacturing efforts caused by contamination, and the coverage or coverage limits of our insurance policies may not be adequate. If our losses exceed our insurance coverage, our financial condition would be affected.

Litigation claims may result in financial losses or harm our reputation and may divert management resources.

When the market price of a stock is volatile, holders of that stock have often initiated securities class action litigation against the company that issued the stock. We cannot predict with certainty the eventual outcome of such litigation, arbitration or third-party inquiry. We may not be successful in defending ourselves or asserting our rights in current or future lawsuits, investigations, or claims that have been or may be brought against us and, as a result, our business could be materially harmed. These lawsuits, arbitrations, investigations or claims may result in large judgments or settlements against us, any of which could have a negative effect on our financial performance and business. Additionally, lawsuits, arbitrations and investigations can be expensive to defend, whether or not the lawsuit, arbitration or investigation has merit, and the defense of these actions may divert the attention of our management and other resources that would otherwise be engaged in running our business.

Our operations, including our relationships with healthcare providers, physicians and third-party payers, are subject to applicable anti-kickback, fraud and abuse, and other healthcare laws and regulations, which, in the event of a violation, exposes us to liability for criminal sanctions, civil penalties, and contractual damages, and reputational harm and diminished profits and future earnings.

Our operations, including any arrangements that we enter into with healthcare providers, physicians, and third-party payers, are subject to broadly applicable fraud and abuse and other healthcare laws and regulations. Such laws and

regulations, including applicable U.S. federal and state healthcare laws and regulations, as well as foreign laws, such as the federal Anti-Kickback Statute, the False Claims Act, the Health Insurance Portability and Accountability Act of 1996, or the Foreign Corrupt Practices Act, may constrain our operation and the business or financial arrangements through which we can market, sell and distribute any drug candidates for which we obtain marketing approval.

Efforts to confirm that our business arrangements with third parties comply with applicable healthcare laws and regulations involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may become subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion of products from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations. If any of the physicians or other healthcare providers or entities with whom we expect to do business are found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

The actions of distributors and specialty pharmacies could affect our ability to sell or market products profitably. Fluctuations in buying or distribution patterns by such distributors and specialty pharmacies could adversely affect our revenues, financial condition, or results of operations.

We have an exclusive agreement with Vanscoy Rare Pharmacy for drug delivery services, and we expect to rely on this pharmacy for a considerable portion of our sales for plozasiran, if approved. The financial failure of Vanscoy Rare Pharmacy could adversely affect our revenues, financial condition or results of operations. Our revenues, financial condition or results of operations may also be affected by fluctuations in their buying or distribution patterns. These fluctuations may result from seasonality, pricing, wholesaler inventory objectives, or other factors.

Risks Related to Our Financial Condition

We have a history of net losses, and we expect to continue to incur net losses and may not achieve or maintain profitability.

We have incurred net losses since our inception and we expect that our operating losses will continue for the foreseeable future as we continue our drug development efforts and prepare for the potential commercialization of our product candidates. To achieve profitability, we must, either directly or through licensing and/or partnering relationships, meet certain milestones, successfully develop and obtain regulatory approval for one or more drug candidates and effectively manufacture, market and sell any drugs we successfully develop. Even if we successfully commercialize drug candidates that receive regulatory approval, we may not be able to realize revenues at a level that would allow us to achieve or sustain profitability. Accordingly, we may never generate significant revenue and, even if we do generate significant revenue, we may never achieve consistent profitability.

We will require substantial additional funds to complete our research and development activities.

Our business currently does not generate the cash that is necessary to finance our operations. Subject to the success of the research and development programs of our Company and our partners, and potential licensing or partnering transactions, we may need to raise additional capital to:

- Fund research and development infrastructure and activities relating to the development of our drug candidates, including preclinical and clinical trials and manufacturing to support these efforts;
- Fund a commercialization infrastructure and activities related to the sale, marketing, customer support, and distribution of our drug products if and when they become approved;
- Fund our general and administrative infrastructure and activities;
- Pursue business development opportunities for our technologies;
- Add to and protect our intellectual property; and
- Retain our management and technical staff.

Our future capital needs depend on many factors, including:

- The scope, duration, and expenditures associated with our research and development, including the progression of our clinical trials, with late-stage trials generally requiring greater capital than early-stage trials;
- Regulatory requirements for our clinical trials;
- The extent to which our research and development and clinical efforts are successful;

- Expenditures to build out or contract for sales, marketing and distribution capabilities as we prepare for the potential commercialization of our product candidates, if any;
- The outcome of potential partnering or licensing transactions, if any, and the extent to which our business development efforts result in the acquisition of new programs or technologies;
- Competing technological developments;
- Our intellectual property positions, if any, in our products; and
- The regulatory approval process and regulatory standards for our drug candidates.

We will need to raise additional funds through public or private equity offerings, debt financings or additional strategic alliances and licensing arrangements in the future to continue our operations. We may not be able to obtain additional financing on terms favorable to us, if at all. General market conditions may make it very difficult for us to seek financing from the capital markets, and the terms of any financing may adversely affect the holdings or the rights of our stockholders. For example, if we raise additional funds by issuing equity securities, further dilution to our stockholders will result, which may substantially dilute the value of investment. In addition, as a condition to providing additional funds to us, future investors may demand, and may be granted, rights superior to those of existing stockholders. Debt financing, if available, may involve restrictive covenants that could limit our flexibility in conducting future business activities and, in the event of insolvency, would be paid before holders of equity securities received any distribution of corporate assets. In order to raise additional funds through alliance, joint venture or licensing arrangements, we may be required to relinquish rights to our technologies or drug candidates or grant licenses on terms that are not favorable to us. If adequate funds are not available, we may have to further delay, reduce or eliminate one or more of our planned activities. These actions would likely reduce the market price of our common stock.

The terms of our financing agreement with Sixth Street Lending Partners and our indebtedness could adversely affect our operations and limit our ability to plan for or respond to changes in our business. If we are unable to comply with restrictions in the financing agreement, the repayment of our existing indebtedness could be accelerated.

On August 7, 2024, we entered into a financing agreement with Sixth Street Lending Partners, as the administrative agent and collateral agent for several lenders. The financing agreement establishes a senior secured term loan facility of $500.0 million (the "Credit Facility"), consisting of $400.0 million funded on the closing date and an additional $100.0 million available at the our option, subject to mutual agreement with Sixth Street, over the seven-year term. We have incurred a substantial amount of debt under the financing agreement which could adversely affect our business.

The financing agreement requires us to make certain payments over time and contains several other negative covenants that, subject to certain exceptions, restrict indebtedness, liens, investments (including acquisitions), fundamental changes, asset sales and licensing transactions, dividends, modifications to material agreements, payment of subordinated indebtedness, and other matters customarily restricted in such agreements. Among other requirements of the financing agreement, we and our subsidiaries party to the financing agreement must maintain certain liquidity thresholds based on our market capitalization. We are also subject to restrictions on sales and licensing transactions with respect to our core intellectual property and product assets, including, but not limited to, olpasiran, plozasiran, zodasiran, fazirsiran, GSK4532990, and daplusiran/tomligisiran, subject to certain exceptions. These and other terms in the financing agreement could restrict our ability to grow our business or enter into transactions that we believe would be beneficial to our business.

Our indebtedness could affect our business in the following ways, among other things: make it more difficult for us to satisfy our contractual and commercial commitments; require us to use a substantial portion of our cash flow subject to mandatory prepayments to pay interest and principal when due, which would reduce funds available for working capital, capital expenditures and other general corporate purposes; limit our ability to obtain additional financing for working capital, capital expenditures, acquisitions and other investments or general corporate purposes; heighten our vulnerability to downturns in our business, our industry or in the general economy; place us at a disadvantage compared to those of our competitors that may have proportionately less debt; limit management's discretion in operating our business; and limit our flexibility in planning for, or reacting to, changes in our business, the industry in which we operate or the general economy.

Our business may not generate cash flows from operations in the future that are sufficient to service our debt and support our growth strategies. In addition, our ability to generate sufficient cash flows to meet our debt obligations depends upon several factors, such as the ability of our Company and our licensees to timely complete clinical trials and obtain marketing approval for our clinical-stage product candidates, to successfully commercialize our clinical-stage product candidates, our receipt of regulatory approval for plozasiran for treatment of FCS, and our future performance, which is subject to financial, business, and other impacts on our operations, many of which are beyond our control. If we are unable to generate sufficient cash flows, we may be required to adopt one or more alternatives, such as obtaining additional equity capital on terms that may be onerous or highly dilutive, selling assets, or restructuring debt. Our ability to refinance our indebtedness will depend on the capital markets and our financial condition at such time. We may not be able to engage in

any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations.

If the estimates we make, or the assumptions on which we rely, in preparing our consolidated financial statements prove inaccurate, our actual results may vary from those reflected in our accruals.

Our consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America. The preparation of these consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of our assets, liabilities, revenues and expenses, the amounts of charges accrued by us and related disclosure of contingent assets and liabilities. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances. We cannot assure you, however, that our estimates, or the assumptions underlying them, will be correct.

Our operating results may fluctuate significantly, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations or our guidance.

Our quarterly and annual operating results have fluctuated and may continue to fluctuate significantly in the future, which makes it difficult for us to predict our future operating results. From time to time, we may enter into license or collaboration agreements or strategic partnerships with other companies that include development funding and significant upfront and milestone payments and/or royalties. These upfront and milestone payments may vary significantly from period to period and any such variance could cause a significant fluctuation in our operating results from one period to the next.

In addition, we measure compensation cost for stock-based awards made to employees at the grant date of the award, based on the fair value of the award, and recognize the cost as an expense over the employee's requisite service period. As the variables that we use as a basis for valuing these awards change over time, including our underlying stock price and stock price volatility, the magnitude of the expense that we must recognize may vary significantly.

Furthermore, our operating results may fluctuate due to a variety of other factors, may of which are outside of our control and may be difficult to predict, including the following:

- the timing and cost of, and level of investment in, research and development activities relating to our current and any future product candidates, which will change from time to time;
- our ability to enroll patients in clinical trials and the timing of enrollment;
- the cost of manufacturing our current and any future product candidates, which may vary depending on FDA guidelines and requirements, the quantity of production and the terms of our agreements with manufacturers and other suppliers;
- expenditures that we will or may incur to acquire or develop additional product candidates and technologies;
- the timing and outcomes of clinical trials for product candidates;
- the need to conduct unanticipated clinical trials or trials that are larger or more complex than anticipated;
- competition from existing and potential future products that compete with any of our product candidates, and changes in the competitive landscape of our industry, including consolidation among our competitors or partners;
- any delays in regulatory review or approval of any of our product candidates;
- the level of demand for any of our product candidates, if approved, which may fluctuate significantly and be difficult to predict;
- the risk/benefit profile, cost and reimbursement policies with respect to our product candidates, if approved, and existing and potential future products that compete with our product candidates;
- our ability to commercialize any of our product candidates, if approved, inside and outside of the United States, either independently or working with third parties;
- our ability to establish and maintain collaborations, licensing or other arrangements;
- our ability to adequately support future growth;
- potential unforeseen business disruptions that increase our costs or expenses;
- future accounting pronouncements or changes in our accounting policies; and
- the changing and volatile global economic environment.

The cumulative effect of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Investors should not rely on our past results as an indication of our future performance. This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our

revenue or operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, or if the forecasts we provide to the market are below the expectations of analysts or investors, the price of our common stock could decline substantially. Such a stock price decline could occur even when we have met any previously publicly stated guidance we may provide.

The investment of our cash, cash equivalents and fixed income securities is subject to risks which may cause losses and affect the liquidity of these investments.

At September 30, 2024, we had $681.0 million in cash, cash equivalents, restricted cash and available-for-sale securities. Our investments may also include commercial paper, securities issued by the U.S. government obligations, and money market funds meeting the criteria of our investment policy, which is focused on the preservation of our capital. These investments are subject to general credit, liquidity, and market and interest rate risks, particularly in the current economic environment. We may realize losses in the fair value of these investments or a complete loss of these investments, which would have a negative effect on our consolidated financial statements. In addition, should our investments cease paying or reduce the amount of interest paid to us, our interest income would suffer. The market risks associated with our investment portfolio may have an adverse effect on our results of operations, liquidity and financial condition.

Our ability to utilize net operating loss carryforwards and other tax benefits may be limited.

We have historically incurred net losses. Under the Internal Revenue Code of 1986, as amended (the "Code"), a corporation is generally allowed a deduction for net operating losses (NOLs) carried forward from a prior taxable year. Under that provision, we can carryforward our NOLs to offset our future taxable income, if any, until such NOLs are used or expire. As of September 30, 2024, we had federal, state, and foreign NOL carryforwards of $223.1 million, $693.2 million, and $38.3 million, respectively. As a result of the Coronavirus Aid, Relief, and Economic Security Act of 2020 ("CARES Act") and legislation commonly referred to as the Tax Cuts and Jobs Act of 2017 ("2017 Tax Act"), NOLs arising before January 1, 2018, and NOLs arising after January 1, 2018, are subject to different rules. Under the CARES Act and 2017 Tax Act, federal NOLs incurred in 2018, 2019 and 2020 can generally be carried back five years, carried forward indefinitely and can offset 100% of future taxable income for tax years before January 1, 2021 and up to 80% of future taxable income for tax years after December 31, 2020. Any NOLs arising on or after January 1, 2021, cannot be carried back, but can generally be carried forward indefinitely and can offset up to 80% of future taxable income. It is uncertain if and to what extent various states will conform to the newly enacted federal tax law. These NOL carryforwards could expire unused before offsetting potential future income tax liabilities.

In addition, under Section 382 and 383 of the Code and corresponding provisions of state law, if a corporation undergoes an "ownership change," which is generally defined as a greater than 50 percent change, by value, in its equity ownership over a three-year period, the corporation's ability to use its pre-change NOL carryforwards and other pre-change tax attributes to offset its post-change income or taxes may be limited. It is possible that we have experienced an ownership change limitation. We may experience ownership changes in the future as a result of subsequent shifts in our stock ownership, some of which may be outside of our control.

If an ownership change occurs and our ability to use our NOL carryforwards is materially limited, it would harm our future operating results by effectively increasing our future tax obligations.

We could be subject to additional tax liabilities.

We are subject to U.S. federal, state, and local taxes in the United States and other countries. Significant judgment is required in evaluating our tax positions. During the ordinary course of business, there are many activities and transactions for which the ultimate tax determination is uncertain. In addition, our tax obligations and effective tax rates could be adversely affected by changes in the relevant tax, accounting and other laws, regulations, principles and interpretations, including those relating to income tax nexus, by recognizing tax losses or lower than anticipated earnings in jurisdictions where we have lower statutory rates and higher than anticipated earnings in jurisdictions where we have higher statutory rates, by changes in foreign currency exchange rates, or by changes in the valuation of our deferred tax assets and liabilities. For instance, beginning in 2022, the 2017 Tax Act eliminated the option of expensing all research and development expenditures in the current year, instead requiring amortization over five years for expenditures in the U.S. and over fifteen years for foreign-based expenditures. There is no assurance that the requirement will be deferred, repealed, or otherwise modified. This change in law increased our tax liability for the fiscal year. We continue to monitor new tax legislation or other developments since significant changes in tax legislation, or in the interpretation of existing legislation, could materially and adversely affect our financial condition and operating results.

Additionally, we may be audited in various jurisdictions, and such jurisdictions may assess additional taxes, sales taxes and value-added taxes against us. Although we believe our tax estimates are reasonable, the final determination of

any tax audits or litigation could be materially different from our historical tax provisions and accruals, which could have a material adverse effect on our operating results or cash flows in the period for which a determination is made.

Our business is subject to changing regulations for corporate governance and public disclosure that has increased both our costs and the risk of noncompliance.

Each year we are required to evaluate our internal controls systems in order to allow management to report on and our Independent Registered Public Accounting Firm to attest to, our internal controls as required by Section 404 of the Sarbanes-Oxley Act. As a result, we continue to incur additional expenses and divert our management's time to comply with these regulations. In addition, if we cannot continue to comply with the requirements of Section 404 in a timely manner, we might be subject to sanctions or investigation by regulatory authorities, such as the SEC, the Public Company Accounting Oversight Board or The Nasdaq Global Select Market. Any such action could adversely affect our financial results and the market price of our common stock.

Risks Related to Investment and Securities

Our Board of Directors has the authority to issue shares of "blank check" preferred stock, which may make an acquisition of the Company by another company more difficult.

We have adopted and may in the future adopt certain measures that may have the effect of delaying, deferring or preventing a takeover or other change in control of the Company that a holder of our common stock might consider in its best interest. For example, our Board of Directors, without further action by our stockholders, currently has the authority to issue up to 5,000,000 shares of preferred stock and to fix the rights (including voting rights), preferences and privileges of these shares ("blank check" preferred). Such preferred stock may have rights, including economic rights, senior to our common stock. These factors could also reduce the price that certain investors might be willing to pay for shares of our common stock and result in the market price being lower than it would be without these provisions.

We do not intend to declare cash dividends on our common stock.

We will not distribute cash to our stockholders unless and until we can develop sufficient funds from operations to meet our ongoing needs and implement our business plan. The time frame for that is unpredictable and investors should not expect dividends in the near future, if at all.

If securities or industry analysts do not publish research reports about our business or if they make adverse recommendations regarding an investment in our stock, our stock price and trading volume may decline.

The trading market for our common stock can be influenced by the research and reports that industry or securities analysts publish about our business. Investors have many investment opportunities and may limit their investments to companies that receive greater coverage from analysts. If additional industry or securities analysts do not commence coverage of the Company, the trading price of our stock could be negatively impacted. If one or more of the analysts downgrade our stock or comment negatively on our prospects, our stock price may decline. If one or more of these analysts cease to cover our industry or us or fail to publish reports about the Company regularly, our common stock could lose visibility in the financial markets, which could also cause our stock price or trading volume to decline. Further, incorrect judgments, estimates or assumptions made by research analysts may adversely affect our stock price, particularly if subsequent performance falls below the levels that were projected by the research analyst(s), even if we did not set or endorse such expectations. Any of these events could cause further volatility in our stock price and could result in substantial declines in the value of our stock.

The market for purchases and sales of our common stock may be limited, and the sale of a limited number of shares could cause the price to fall sharply.

Although our common stock is listed for trading on the Nasdaq Global Select Market, at various times our securities are relatively thinly traded. Investor trading patterns could serve to exacerbate the volatility of the price of our stock. For example, mandatory sales of our common stock by institutional holders could be triggered if an investment in our common stock no longer satisfies their investment standards and guidelines. It may be difficult to sell shares of our common stock quickly without significantly depressing the value of the stock. Unless we are successful in developing continued investor interest in our stock, sales of our stock could result in major fluctuations in the price of the stock.

Our common stock price has fluctuated significantly over the last several years and may continue to do so in the future, without regard to our results of operations and prospects.

Because we are still a clinical-stage pharmaceutical company and have not yet commercialized a drug, there are few objective metrics by which our progress may be measured. Consequently, we expect that the market price of our common stock will continue to fluctuate significantly. We may not continue to generate substantial revenue from the license or sale of our technology for several years, if at all. In the absence of product revenue as a measure of our operating performance, we anticipate that investors and market analysts will assess our performance by considering factors such as:

- Announcements of developments related to our business;
- Our ability to enter into or extend investigation phase, development phase, commercialization phase and other agreements with new and/or existing partners;
- Announcements regarding the status of any or all of our collaborations or products, including clinical trial results;
- Market perception and/or investor sentiment regarding our technology;
- Announcements of actions taken by regulatory authorities, such as the U.S. Food and Drug Administration;
- Announcements regarding developments in the RNA interference, antisense technologies, gene editing technologies or biotechnology fields in general;
- Announcements regarding clinical trial results with our products or competitors' products;
- Market perception and/or announcements regarding other companies developing products in the field of biotechnology generally or specifically RNA interference;
- The issuance of competitive patents or disallowance or loss of our patent rights;
- The addition or departure of key executives; and
- Variations in our operating results.

We will not have control over many of these factors but expect that they may influence our stock price. As a result, our stock price may be volatile and such volatility could result in the loss of all or part of your investment.

Stockholder equity interest may be substantially diluted in any additional equity issuances.

We expect that significant additional capital will be needed in the future to continue our planned operations. To the extent we raise additional capital by issuing equity securities, our stockholders may experience substantial dilution. We may sell common stock, convertible securities or other equity securities in one or more transactions at prices and in a manner we determine from time to time. If we sell common stock, convertible securities or other equity securities in more than one transaction, investors may be materially diluted by subsequent sales. These sales may also result in material dilution to our existing stockholders, and new investors could gain rights superior to our existing stockholders.

We are subject to stringent and evolving U.S. and foreign laws, regulations, rules, contractual obligations, policies and other obligations related to data privacy and security. Our actual or perceived failure to comply with such obligations could lead to regulatory investigations or actions; litigation and mass arbitration demands; fines and penalties; disruptions of our business operations; reputational harm; loss of revenue or profits; and other adverse business consequences.

In the ordinary course of business, we collect, receive, store, process, generate, use, transfer, disclose, make accessible, protect, secure, dispose of, transmit, and share confidential, proprietary, and sensitive information, including personal information, business data, trade secrets, intellectual property, information we collect about trial participants in connection with clinical trials, sensitive third-party data, business plans, transactions, and financial information.

These activities may subject us to numerous data privacy and security obligations governing the collection, use, disclosure, protection, and other processing of personal data, such as various laws, regulations, guidance, industry standards, external and internal data privacy and security policies, contractual requirements, and other obligations relating to data privacy and security.

In the United States, there are both state and federal data privacy and security laws, including data breach notification laws, data privacy laws (including biometric privacy laws), consumer protection laws (e.g., Section 5 of the Federal Trade Commission Act), the Health Insurance Portability and Accountability Act ("HIPPA"), and other similar laws (e.g., wiretapping laws). For example, the California Consumer Privacy Act of 2018, as amended by the California Privacy Rights Act of 2020 (together, the "CCPA") applies to personal data of consumers, business representatives, and employees, and requires businesses to provide specific disclosures in privacy notices and certain rights to California residents with respect to their personal data. The CCPA provides for civil penalties of up to $7,500 per intentional violation

and $2,500 per unintentional violation and allows private litigants affected by certain data breaches to recover significant statutory damages.

Outside the United States there are additional laws, regulations, and industry standards governing data privacy and security. For example, the General Data Protection Regulation ("GDPR") and the GDPR as incorporated into UK law pursuant to the European Union (Withdrawal) Act 2018 (the "UK GDPR") impose strict requirements for processing personal data, including health-related information. Under the GDPR and UK GDPR, companies may face fines of up to 20 million Euros or 4% of annual global revenue, whichever is greater; or private litigation related to processing of personal data. In addition, the GDPR and UK GDPR impose specific restrictions on the transfer of personal data to countries outside of the EEA and UK. Although there are currently various mechanisms that may be used to make such transfers in compliance with law, such as the EEA and UK's standard contractual clauses, these mechanisms are subject to legal challenges. Additionally, companies that transfer personal data out of the EEA and UK to other jurisdictions are subject to scrutiny from regulators, individual litigants, and activities groups.

Preparing for and complying with these obligations requires us to devote resources and may necessitate changes to our services, information technologies, systems, and practices and to those of any third parties that process personal data on our behalf.

If we or the third parties on which we rely fail, or are perceived to have failed, to address or comply with applicable data privacy and security obligations, we could face significant consequences, including but not limited to: government enforcement actions (e.g., investigations, fines, penalties, audits, inspections, and similar); litigation (including class-action claims); additional reporting requirements and/or oversight; bans on processing personal data; and orders to destroy or not use personal data. Any of these events could have a material adverse effect on our reputation, business, or financial condition, including but not limited to: loss of customers; inability to process personal data or to operate in certain jurisdictions; limited ability to develop or commercialize our products; expenditure of time and resources to defend any claim or inquiry; adverse publicity; or substantial changes to our business model or operations.

Economic and Industry Risks

Unfavorable global economic conditions, whether brought about by material global crises, health epidemics, military conflicts or war, geopolitical and trade disputes or other factors, may adversely affect our business and financial results.

Our business is sensitive to global economic conditions, which can be adversely affected by epidemics and other public health crises (such as the COVID-19 pandemic), political and military conflict, trade and other international disputes, significant natural disasters (including as a result of climate change) or other events that disrupt macroeconomic conditions. Adverse macroeconomic conditions, including inflation, slower growth or recession, new or increased tariffs and other barriers to trade, changes to fiscal and monetary policy or government budget dynamics (particularly in the pharmaceutical and biotech areas), tighter credit, higher interest rates, volatility in financial markets, high unemployment, labor availability constraints, currency fluctuations and other challenges in the global economy have in the past adversely affected, and may in the future adversely affect, us and our business partners and suppliers.

For example, trade policies and geopolitical disputes (including as a result of China-Taiwan relations) and other international conflicts can result in tariffs, sanctions and other measures that restrict international trade, and can materially adversely affect our business, particularly if these measures occur in regions where we source our components or raw materials. For example, tensions between the United States and China have led to a series of tariffs being imposed by the United States on imports from China mainland, as well as other business restrictions. Tariffs increase the costs of the components and raw materials we source. Countries may also adopt other measures, such as controls on imports or exports of goods, technology or data, that could adversely impact the Company's operations and supply chain. These geopolitical risks could also adversely affect Visirna.

Further, military conflicts or wars (such as the ongoing conflicts between Russia and Ukraine and in the Middle East) can cause exacerbated volatility and disruptions to various aspects of the global economy. The uncertain nature, magnitude, and duration of hostilities stemming from such conflicts, including the potential effects of sanctions and counter-sanctions, or retaliatory cyber-attacks on the world economy and markets, have contributed to increased market volatility and uncertainty, which could have an adverse impact on macroeconomic factors that affect our business and operations, such as worldwide supply chain issues. Additionally, the ongoing conflict between Russia and Ukraine has impacted our business decisions with respect to potential clinical trial sites in Europe. For example, a number of our clinical trial sites we had previously planned to use in Russia, Ukraine and Belarus were shut down and we had to seek alternatives in other geographies. We cannot be certain of the overall impact of the conflict between Russia and Ukraine on our ability to conduct and complete our clinical trials as planned, and any interruptions of our clinical trials can result in significant delays or termination of the research, development or commercialization of our drug candidates, which could impair our ability to generate revenues and harm our business and financial condition. Moreover, the conflict between

Israel and Palestine could impact future business decisions to locate potential clinical trials in Israel. It is not possible to predict the short and long-term implications of military conflicts or wars or geopolitical tensions which could include further sanctions, uncertainty about economic and political stability, increases in inflation rate and energy prices, cyber-attacks, supply chain challenges and adverse effects on currency exchange rates and financial markets.

Additionally, our operations and facilities, as well as operations of our suppliers and manufacturers, may be located in areas that are prone to earthquakes, wildfires and other natural disasters. Such operations and facilities are also subject to the risk of interruption by drought, power shortages, nuclear power plant accidents and other industrial accidents, terrorist attacks and other hostile acts, ransomware and other cybersecurity attacks, labor disputes, public health crises, and other events beyond the Company's control. Global climate change is resulting in certain types of natural disasters occurring more frequently or with more intense effects. Such events can create delays or interruptions to the Company's development efforts and inefficiencies in the Company's supply and manufacturing chain. Significant delays in our development efforts could materially impact our ability to obtain regulatory approval and to commercialize our products. Any insurance we maintain against damage to our property and the disruption of our business due to disaster may not be sufficient to cover all of our potential losses and may not continue to be available to us on acceptable terms, or at all. Further, because the Company relies on single or limited sources for the supply and manufacture of many critical components, a business interruption affecting such sources would exacerbate any negative consequences to the Company.

Any future public health crises, may affect our operations and those of third parties on which we rely, including our business partners and suppliers. We may in the future experience:

- delays in receiving authorization from regulatory authorities to initiate any planned clinical trials, inspections, reviews and approvals of products;
- delays or difficulties enrolling patients in our clinical trials;
- delays in or disruptions to the conduct of preclinical programs and clinical trials;
- constraints on the movement of products and supplies through the supply chain, which can disrupt our ability to conduct clinical trials and develop our products;
- price increases in raw materials and capital equipment, as well as increasing price competition in our markets;
- adverse impacts on our workforce and/or key employees; and
- increased risk that counterparties to our contractual arrangements will become insolvent or otherwise unable to fulfill their contractual obligations.

Drug development is time consuming, expensive and risky.

We are focused on technology related to new and improved pharmaceutical candidates. Product candidates that appear promising in the early phases of development, such as in animal and early human clinical trials, often fail to reach the market for a number of reasons, such as:

- Clinical trial results may be unacceptable, even though preclinical trial results were promising;
- Inefficacy and/or harmful side effects in humans or animals;
- The necessary regulatory bodies, such as the FDA, may not approve our potential product for the intended use, or at all; and/or
- Manufacturing and distribution may be uneconomical.

For example, any positive preclinical results in animals may not be replicated in human clinical studies. These programs may be also found to be unsafe in humans, particularly if higher doses are needed to achieve the desired levels of efficacy. Also, the positive safety results from single dose human clinical studies may not be replicated in other human studies, including multiple dose studies. Clinical and preclinical study results are frequently susceptible to varying interpretations by scientists, medical personnel, regulatory personnel, statisticians and others, which often delays, limits, or prevents further clinical development or regulatory approvals of potential products. Clinical trials can take many years to complete, including the process of study design, clinical site selection and the recruitment of patients. As a result, we can experience significant delays in completing clinical studies, which can increase the cost of developing a drug candidate and shorten the time that an approved product may be protected by patents. If our drug candidates are not successful in human clinical trials, we may be forced to curtail or abandon certain development programs. If we experience significant delays in commencing or completing our clinical studies, we could suffer from significant cost overruns, which could negatively affect our capital resources and our ability to complete these studies.

The healthcare system is under significant financial pressure to reduce costs, which could reduce payment and reimbursement rates for drugs.

Throughout the world and particularly in the United States, the healthcare system is under significant financial pressure to reduce costs. The price of pharmaceuticals has been a topic of considerable public discussion that could lead to price controls or other price-limiting strategies by payors that have the effect of lowering payment and reimbursement rates for drugs or otherwise making the commercialization of pharmaceuticals less profitable. Many federal and state legislatures have considered, and adopted, healthcare policies intended to curb rising healthcare costs, such as the Inflation Reduction Act of 2022. These cost-containment measures may include, among other measures: requirements for pharmaceutical companies to negotiate prescription drug prices with government healthcare programs; controls on government-funded reimbursement for drugs; new or increased requirements to pay prescription drug rebates to government healthcare programs, including if drug prices increase at a higher rate than inflation; controls on healthcare providers; challenges to or limits on the pricing of drugs, including pricing controls or limits or prohibitions on reimbursement for specific products through other means; requirements to try less expensive products or generics before a more expensive branded product; and public funding for cost effectiveness research, which may be used by government and private third-party payors to make coverage and payment decisions. Political, economic and regulatory developments may further complicate developments in healthcare systems and pharmaceutical drug pricing. These developments could, for example, impact our potential licensing agreements as commercial and collaborative partners may also consider the impact of these pressures on their licensing strategies.

Any new laws or regulations that have the effect of imposing additional costs or regulatory burden on pharmaceutical manufacturers, or otherwise negatively affect the industry, could adversely affect our ability to successfully commercialize our product candidates. The implementation of any price controls, caps on prescription drugs or price transparency requirements could adversely affect our business, operating results and financial condition.

Regulatory standards are subject to change over time, making it difficult to accurately predict the likelihood of marketing approval even when clinical trials meet their endpoints.

Regulatory standards are promulgated by various government entities and are subject to change based on factors such as scientific developments, public perceptions of risk, and political forces. Because clinical trials often take years to complete, it is sometimes possible for standards that exist during the conception and initiation of a clinical trial to change before the clinical trial is completed or reviewed by government regulators. For example, we may initiate clinical trials that are designed to show benefits on relatively short-term endpoints, but ultimately be required to show benefits in longer-term outcome studies. While some government entities have safeguards intended to ensure standards agreed upon by sponsors and regulators at the outset of a clinical trial are applied during regulatory review processes, those safeguards generally permit regulators to apply more rigorous standards where regulators believe doing so is necessary. As such, there can be no assurance that regulatory standards that are appropriate at the outset of a clinical trial program will not become more rigorous during the regulatory approval process and could potentially result in a delayed approval or denial of marketing authorization.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 1C. CYBERSECURITY

The Company maintains a cybersecurity program, with direct oversight from senior management and the Board of Directors (the "Board"), to manage information, data, and technology security. The cybersecurity program is informed in part by the National Institute of Standards and Technology Cybersecurity Framework (NIST CSF) and is designed to help identify, assess, and manage cybersecurity risks relevant to the Company's business. The Company's cybersecurity program has been developed in light of the nature of the Company's business, resource availability, requirements from stakeholders, and industry trends. The Company has formed an internal cross-functional Technology Risk Management Committee comprised of representative leaders from various aspects of the Company's business to broadly implement its cybersecurity program.

The Company's cybersecurity program prioritizes vulnerability management, risk reduction, detection, and prevention to help protect against material risks from cybersecurity threats to its information systems. The Company routinely conducts internal and third-party cybersecurity risk assessments and penetration tests and incorporates relevant findings and recommendations into its overall cybersecurity strategy, as appropriate. Through these assessments, the Company develops targeted strategies intended to address the most significant cybersecurity risks and conducts at least one annual cybersecurity incident tabletop exercise to refine response plans.

The Company's cybersecurity program emphasizes defense, rapid detection, and remediation of cybersecurity threats and incidents, including the use of various security tools and systems based on defense-in-depth and zero-trust principles that are intended to meet control requirements. The cybersecurity program also encompasses crisis incident response guidelines that detail the processes for the detection, response, mitigation, and remediation of cybersecurity incidents, in order to support the effective management of, response to, communication during, and recovery from any such incidents.

A key element of the Company's strategy is fostering training and awareness through annual cybersecurity training and role-based phishing tests for employees and certain third parties having access to the Company's information systems. The Company also utilizes a third-party cybersecurity operations monitoring center to help identify threats and incidents to the Company's servers and computers. The Company's cybersecurity preparedness program includes specific requirements and guidelines for the information security team relating to the Company's computer emergency response preparedness, intrusion response preparedness, and incident response preparedness.

When a potential cybersecurity threat or incident is identified, our processes require that the Senior Director of Information Security be promptly notified of the incident, who then is to conduct an initial investigation to determine the probability and potential of the threat or incident to have a material impact on key business systems and processes. If there is a reasonable possibility for a material impact to the Company's business or information systems, the cybersecurity program requires that the Technology Risk Management Committee be promptly notified, which then assigns a risk level to the threat or incident. All threats and incidents identified as high-risk are promptly escalated to Company leadership and the legal department, who are tasked with activating and implementing a high-risk information security incident mitigation and response plan, which details the roles, responsibilities, and strategies to respond. Our cybersecurity program also requires that high-risk cybersecurity incidents or threats be reported to the Company's Materiality Committee and the Audit Committee of the Board within 24 hours of their designation as high-risk by the Technology Risk Management Committee.

Cybersecurity risks are incorporated into our overall risk management program. If a cybersecurity risk is identified as high-risk, a response and mitigation plan is developed, and progress updates on the plan are routinely reported to the Technology Risk Management Committee and tracked by the Audit Committee of the Board as part of our overall risk management process.

The Company is not aware of any cybersecurity threats or incidents in the last fiscal year, including as a result of any prior cybersecurity incidents, that have had a material impact on our Company, including its business strategy, operations, or financial condition. However, we face certain ongoing cybersecurity risks and threats that, if realized, are reasonably likely to materially affect us. Additional information on cybersecurity risks we face is discussed in Part I, Item 1A "Risk Factors," under the heading "Our business and operations could suffer in the event of a cybersecurity incident or other information technology system failures."

Execution of the Company's cybersecurity program is delegated by the Board to the Senior Director of Information Security, who has nearly 25 years of relevant experience in information security, including 13 years at the Company, and is further supported by a team of security professionals within the Information Systems & Informatics department. The Senior Director of Information Security reports to the Vice President of Information Systems & Informatics, and they meet periodically with senior leadership and the Board to review metrics on cybersecurity preparedness, incidents, mitigations and remediation efforts. In addition, the Company's internal audit team conducts periodic audits of its systems and cybersecurity processes, with findings reported to the Audit Committee and senior management.

The Company has also established a management-level Technology Risk Committee, which includes leaders from finance, legal, operations, quality & compliance, and information systems & informatics, who are responsible for overseeing the execution of high-risk incident response and mitigation plans. This committee actively reviews technology strategies, physical and cybersecurity threat assessment, and emerging issues and related initiatives. It is also responsible for evaluating the materiality of information for SEC filings and, as required or as otherwise appropriate, coordinates with the Company's Materiality Committee to support timely disclosure of relevant information.

ITEM 2. PROPERTIES

The following table summarizes the Company's leased facilities as of November 20, 2024.

	Approximate Square Footage	Primary Use	Lease Expiration	Remaining Lease Term (year)
Pasadena, California	49,000	Corporate Headquarters	April 2027	2.5
Madison, Wisconsin	107,000	Research Facility	September 2031	6.9
San Diego, California	144,000	Research and Office Facility	April 2038	13.5

The Company owns land in the Verona Technology Park in Verona, Wisconsin, which has been developed into an approximately 160,000 square foot drug manufacturing facility and an approximately 140,000 square foot laboratory and office facility which will support the Company's manufacturing process development and analytical activities. During fiscal year 2024, the Company completed the build out of one of its laboratory and office facilities and plans to finalize the manufacturing facility by the end of the first quarter of fiscal year 2025.

ITEM 3. LEGAL PROCEEDINGS

Legal Proceedings are set forth in the Company's financial statement schedules in Part IV, Item 15 of this Annual Report on Form 10-K and are incorporated herein by reference. See Note 7 — Commitments and Contingencies of Notes to Consolidated Financial Statements of Part IV, "Item 15. Exhibits and Financial Statement Schedules."

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information

Shares of the Company's common stock are traded on The Nasdaq Global Select Market under the symbol "ARWR." There were 89 holders of record of the Company's common stock as of November 20, 2024.

Dividends

The Company has never paid dividends on its common stock and does not anticipate that it will do so in the foreseeable future.

Recent Sales of Unregistered Securities

To the extent required by Form 10-K, the disclosures set forth in Part II, Item 9B of this Annual Report on Form 10-K under the headings "Stock Purchase Agreement" and "Securities Purchase Agreement" are incorporated herein by reference.

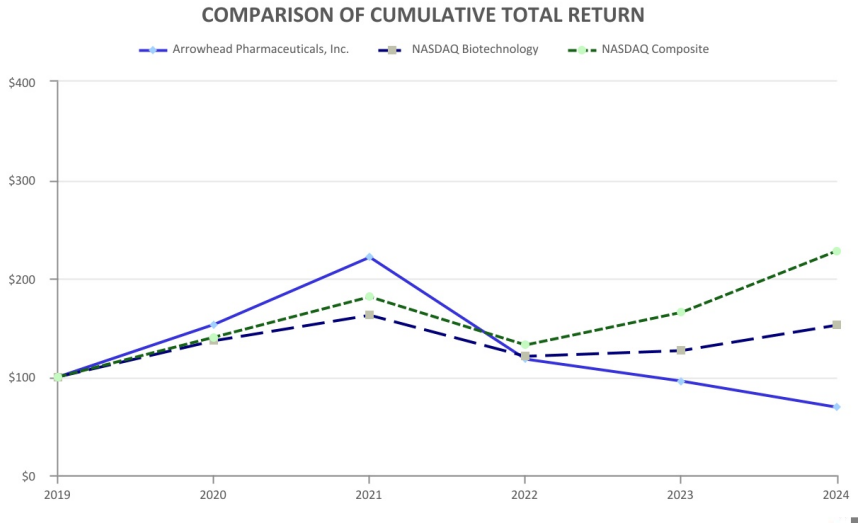
Repurchases of Equity Securities

None.

Performance Graph

The following performance graph shall not be deemed "soliciting material" or to be "filed" with the SEC, nor shall such information be incorporated by reference into any future filing under the Securities Act of 1933 or Securities Exchange Act of 1934, each as amended, except to the extent that we specifically incorporate it by reference into such filing. The graph compares the cumulative 5-year total return to stockholders on the Company's common stock relative to the cumulative total returns of the Nasdaq Composite Index and the Nasdaq Biotechnology Index. The Company selected the Nasdaq Biotechnology Index because it believes the index reflects the market conditions within the industry in which the Company primarily operates. The comparison of total return on investment, defined as the change in year-end stock price plus reinvested dividends, for each of the periods assumes that $100 was invested on September 30, 2019, in each of the Company's common stock, the Nasdaq Composite Index and the Nasdaq Biotechnology Index, with investment weighted on the basis of market capitalization.

The comparisons in the following graph are based on historical data and are not intended to forecast the possible future performance of the Company's common stock.



$100 investment in stock or index	Ticker	2019	2020	2021	2022	2023	2024
Arrowhead Pharmaceuticals, Inc.	ARWR	$ 100.00	$ 152.80	$ 221.54	$ 117.28	$ 95.35	$ 68.74
NASDAQ Biotechnology Index	^NBI	$ 100.00	$ 136.10	$ 162.58	$ 120.46	$ 126.41	$ 152.44
NASDAQ Composite Index	^IXIC	$ 100.00	$ 139.61	$ 180.62	$ 132.21	$ 165.26	$ 227.38

ITEM 6. RESERVED

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

OVERVIEW

The Company develops medicines that treat intractable diseases by silencing the genes that cause them. Using a broad portfolio of RNA chemistries and efficient modes of delivery, the Company's therapies trigger the RNAi interference mechanism to induce rapid, deep and durable knockdown of target genes. RNAi is a mechanism present in living cells that inhibits the expression of a specific gene, thereby affecting the production of a specific protein. RNAi-based therapeutics may leverage this natural pathway of gene silencing to target and shut down specific disease-causing genes.

The Company believes that TRiM™ enabled therapeutics offer several potential advantages over prior generation and competing technologies, including: simplified manufacturing and reduced costs; multiple routes of administration including subcutaneous injection and inhaled administration; the ability to target multiple tissue types including liver, lung, central nervous system (CNS), muscle, and adipose tissue; and the potential for improved safety and reduced risk of intracellular buildup, because there are fewer metabolites from smaller, simpler molecules.

The Company's pipeline includes:

- Hypertriglyceridemia - plozasiran (formerly ARO-APOC3)
- Dyslipidemia - zodasiran (formerly ARO-ANG3)
- Cardiovascular disease - olpasiran (formerly AMG 890 or ARO-LPA, out-licensed to Amgen)
- Muco-obstructive or inflammatory pulmonary conditions - ARO-MUC5AC and ARO-RAGE
- Idiopathic pulmonary fibrosis - ARO-MMP7
- Metabolic-dysfunction associated steatohepatitis (MASH) - GSK-4532990 (formerly ARO-HSD, out licensed to GSK);
- Alpha-1 antitrypsin deficiency (AATD) - fazirsiran (formerly ARO-AAT, a collaboration with Takeda)
- Chronic hepatitis B virus - daplusiran/tomligisiran (GSK5637608, formerly JNJ-3989, out-licensed to GSK)
- Complement mediated diseases - ARO-C3
- Metabolic-dysfunction associated steatohepatitis (MASH) - ARO-PNPLA3 (formerly JNJ-75220795 or ARO-JNJ1);
- Facioscapulohumeral muscular dystrophy - ARO-DUX4;
- Dystrophia myotonica protein kinase (DMPK) - ARO-DM1;
- Hepatic expression of complement factor B (CFB) - ARO-CFB
- Obesity - ARO-INHBE; and
- Spinocerebellar ataxia 2 - ARO-ATXN2

The Company operates lab facilities in California and Wisconsin, where its research and development activities, including the development of RNAi therapeutics, take place. The Company's principal executive offices are located in Pasadena, California.

The Company continues to develop other clinical candidates for future clinical trials. Clinical candidates are tested internally and through GLP toxicology studies at outside laboratories. Drug materials for such studies and clinical trials are either manufactured internally or contracted to third-party manufacturers. The Company engages third-party contract research organizations (CROs) to manage clinical trials and works cooperatively with such organizations on all aspects of clinical trial management, including plan design, patient recruiting, and follow up. These outside costs, including toxicology/efficacy testing and manufacturing costs, as well as the preparation for and administration of clinical trials, are referred to as "candidate costs." As clinical candidates progress through clinical development, candidate costs will increase.

2024 Business Highlights

During fiscal year 2024, the Company continued to develop and advance its pipeline and partnered candidates and expand its facilities to support its growing programs. The bullets below highlight some of these key developments; however, this list is not all-inclusive and is meant to be read in conjunction with the entirety of management's discussion and analysis, the Company's Consolidated Financial Statements and notes thereto, and all other items contained within this Annual Report on Form 10-K.

- Presented new pivotal Phase 3 Data from PALISADE study of plozasiran in patients with familial chylomicronemia syndrome (FCS) at the European Society of Cardiology (ESC) Congress 2024 and simultaneously published in The New England Journal of Medicine. The Company filed a New Drug Application on November 16, 2024;

- Presented preclinical data and detailed plans to advance two next generation RNAi-based candidates, ARO-INHBE and ARO-ALK7, into upcoming clinical studies for the treatment of obesity and metabolic diseases. In preclinical studies to date, these candidates demonstrated the potential to reduce body weight and fat mass with a novel mechanism of action that may lead to improved preservation of lean muscle mass compared to currently approved obesity therapies. On September 23, 2024, the Company filed for regulatory clearance to initiate a Phase 1/2a clinical trial of ARO-INHBE and plans to file for regulatory clearance before the end of 2024 to initiate a clinical trial for its second obesity candidate, ARO-ALK7;
- Announced successful top-line results from the pivotal Phase 3 PALISADE study of investigational plozasiran in patients with familial chylomicronemia syndrome (FCS). The Company highlighted recent data for its cardiometabolic pipeline at its June 25, 2024, Cardiometabolic event;
- Announced results from the Phase 2b double blind, randomized ARCHES-2 study of investigational zodasiran in patients with mixed hyperlipidemia;
- Announced that new interim clinical data on ARO-RAGE achieves high level of gene knockdown in patients with asthma;
- Amgen completed enrollment in Amgen's Phase 3 OCEAN(a) - outcomes trial of olpasiran, triggering a $50.0 million milestone payment to the Company from Royalty Pharma, which was paid in the third quarter of fiscal 2024;
- Presented final data from the double-blind treatment period of the Company's Phase 2 SHASTA-2 study of investigational plozasiran in patients with severe Hypertriglyceridemia. Results from the SHASTA-2 study showed dramatic, consistent, and sustained reductions in Apolipoprotein C-III (APOC3) and triglycerides and improvement in multiple atherogenic lipoprotein levels;
- Announced an Expanded Access Program ("EAP") to make investigational plozasiran available outside of a clinical trial for qualifying patients with familial chylomicronemia syndrome (FCS);
- Initiated a Phase 1/2a clinical trial of ARO-DM1, being developed as a potential treatment for type 1 myotonic dystrophy (DM1), the most common adult-onset muscular dystrophy;
- Filed an application for clearance to initiate a Phase 1/2a clinical trial of ARO-CFB, being developed as a potential treatment for complement mediated renal disease;
- Entered into an Amended and Restated License Agreement with GSK, pursuant to which GSK received a worldwide, exclusive license to develop and commercialize daplusiran/tomligisiran (GSK5637608, formerly JNJ-3989). Daplusiran/tomligisiran had previously been licensed to Janssen Pharmaceuticals, Inc.

2024 Financial Performance Summary

Net loss attributable to Arrowhead Pharmaceuticals, Inc. was $599.5 million for the year ended September 30, 2024 as compared to $205.3 million for the year ended September 30, 2023. Net loss per share – diluted was $5.00 for the year ended September 30, 2024 as compared to $1.92 for the year ended September 30, 2023. The change in net loss for the year ended September 30, 2024 was mainly due to a decrease in revenue from the Company's license and collaboration agreements, in conjunction with increased research and development expenses, which have continued to increase as the Company's pipeline of candidates has expanded and progressed through clinical trial phases.

The Company entered into an underwriting agreement with Jefferies LLC, BofA Securities, Inc., and Cowen and Company, LLC, as representatives of the several underwriters. The Company issued 15,790,000 shares of common stock at a price of $28.50 per share. The aggregate purchase price paid by investors was $450.0 million and the Company received net proceeds of $429.3 million after deducting advisory fees and offering expenses.

Further, the Company entered into a financing agreement with Sixth Street Lending Partners, as representatives of the several lenders. The financing agreement provides for a senior secured term loan facility of $500.0 million, which includes $400.0 million funded on the closing date with an additional $100.0 million at the Company's option during the seven-year term of the agreement. The Company received net proceeds of $388.9 million, after issuance costs as of September 30, 2024. This is discussed further in Note 14, Financing Agreements of the Notes to the Company's Consolidated Financial Statements in Part IV, "Item 15. Exhibits and Financial Statement Schedules."

The Company had $102.7 million of cash, cash equivalents and restricted cash and $578.3 million in available-for-sale securities as of September 30, 2024, as compared to $110.9 million of cash, cash equivalents and restricted cash and $292.7 million in available-for-sale securities as of September 30, 2023. Based upon the Company's current cash and

investment resources and operating plan, the Company expects to have sufficient liquidity to fund operations for at least the next twelve months from the date of the issuance of these consolidated financial statements.

Critical Accounting Estimates

Management makes certain judgments and uses certain estimates and assumptions when applying U.S. generally accepted accounting principles ("GAAP") in the preparation of the Company's Consolidated Financial Statements. On an ongoing basis, the Company evaluates its estimates, judgments and assumptions. The Company bases its estimates on historical experience and on various other assumptions that it believes are reasonable, the results of which form the basis for making judgments about the carrying values of assets, liabilities and equity and the amount of revenue and expense. Actual results may vary from what the Company anticipates and different assumptions or estimates about the future could change its reported results. The Company believes the following accounting policies are the most critical to it, in that they require its most difficult, subjective or complex judgments in the preparation of the Company's Consolidated Financial Statements. For further information, see Note 1, Organization and Significant Accounting Policies of the Notes to the Company's Consolidated Financial Statements in Part IV, "Item 15. Exhibits and Financial Statement Schedules."

Revenue Recognition—The Company has adopted Financial Accounting Standards Board ("FASB") Topic 606 – *Revenue for Contracts from Customers.* The Company has not yet achieved commercial sales of its drug candidates to date, however, this standard is applicable to its licensing and collaboration agreements. This is discussed further in Note 2, Collaboration and License Agreements of the Notes to the Company's Consolidated Financial Statements in Part IV, "Item 15. Exhibits and Financial Statement Schedules."

At contract inception, the Company assesses whether the goods or services promised within each contract are distinct and, therefore, represent a separate performance obligation, or whether they are not distinct and are combined with other goods and services until a distinct bundle is identified. The Company then determines the transaction price, which typically includes upfront payments and any variable consideration that it determines is probable to not cause a significant reversal in the amount of cumulative revenue recognized when the uncertainty associated with the variable consideration is resolved. The Company then allocates the transaction price to each performance obligation and recognizes the associated revenue when (or as) each performance obligation is satisfied.

The Company recognizes the transaction price allocated to upfront license payments as revenue upon delivery of the license to the customer and resulting ability of the customer to use and benefit from the license, if the license is determined to be distinct from the other performance obligations identified in the contract. These other performance obligations are typically to perform research and development services for the customer, often times relating to the candidate that the customer is licensing. If the license is not considered to be distinct from other performance obligations, the Company assesses the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied at a point in time or over time. If the performance obligation is satisfied over time, the Company then determines the appropriate method of measuring progress for purposes of recognizing revenue from license payments. The Company evaluates the measure of progress each reporting period and, if necessary, adjusts the related revenue recognition.

Typically, the Company's collaboration agreements entitle it to additional payments upon the achievement of milestones or royalties on sales. The milestones are generally categorized into three types: development milestones, generally based on the initiation of toxicity studies or clinical trials; regulatory milestones, generally based on the submission, filing or approval of regulatory applications such as a NDA in the United States; and sales-based milestones, generally based on meeting specific thresholds of sales in certain geographic areas. The Company evaluates whether it is probable that the consideration associated with each milestone or royalty will not be subject to a significant reversal in the cumulative amount of revenue recognized. Amounts that meet this threshold are included in the transaction price using the most-likely-amount method, whereas amounts that do not meet this threshold are excluded from the transaction price until they meet this threshold. At the end of each subsequent reporting period, the Company re-evaluates the probability of a significant reversal of the cumulative revenue recognized for its milestones and royalties, and, if necessary, adjusts its estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect revenues and net income in the Company's consolidated statements of operations and comprehensive loss. Typically, milestone payments and royalties are achieved after the Company's performance obligations associated with the collaboration agreements have been completed and after the customer has assumed responsibility for the respective clinical or preclinical program. Milestones or royalties achieved after the Company's performance obligations have been completed are recognized as revenue in the period the milestone or royalty was achieved. If a milestone payment is achieved during the performance period, the milestone payment would be recognized as revenue to the extent performance had been completed at that point, and the remaining balance would be recorded as deferred revenue.

The revenue standard requires the Company to assess whether a significant financing component exists in determining the transaction price. The Company performs this assessment at the onset of its licensing or collaboration

agreements. Typically, a significant financing component does not exist because the customer is paying for a license or services in advance with an upfront payment. Additionally, future royalty payments are not substantially within the control of the Company or the customer.

The revenue standard requires the Company to allocate the arrangement consideration on a relative standalone selling price basis for each performance obligation after determining the transaction price of the contract and identifying the performance obligations to which that amount should be allocated. The relative standalone selling price is defined in the revenue standard as the price at which an entity would sell a promised good or service separately to a customer. If other observable transactions in which the Company has sold the same performance obligation separately are not available, the Company estimates the standalone selling price of each performance obligation. Key assumptions to determine the standalone selling price may include forecasted revenues, development timelines, reimbursement rates for personnel costs, discount rates and probabilities of technical and regulatory success.

Whenever we determine that goods or services promised in a contract should be accounted for as a combined performance obligation over time, the Company determines the period over which the performance obligations will be performed and revenue will be recognized. Revenue is recognized using the input method. Labor hours, costs incurred or patient visits in clinical trials are typically used as the measure of performance. Significant management judgment is required in determining the level of effort required under an arrangement and the period over which the Company is expected to complete its performance obligations. If the Company determines that the performance obligation is satisfied over time, any upfront payment received is initially recorded as deferred revenue on the Company's consolidated balance sheets.

Collaborative Arrangements—The Company analyzes its collaborative arrangements to assess whether such arrangements involve joint operating activities performed by parties that are both active participants in the activities and exposed to significant risks and rewards, and therefore an appropriate recognition method is determined and applied consistently, either by analogy to appropriate accounting literature or by applying a reasonable accounting policy election. For collaborative arrangements that are within the scope of FASB Topic 808—*Collaborative Arrangements*, the Company evaluates the income statement classification for presentation of amounts due to or owed from other participants associated with multiple units of account in a collaborative arrangement based on the nature of each activity. Payments or reimbursements that are the result of a collaborative relationship instead of a customer relationship, such as co-development and co-commercialization activities, are recorded as increases or decreases to research and development expense or general and administrative expense, as appropriate.

Clinical Accruals—The Company accrues liabilities for products received or services incurred, particularly for ongoing clinical trials, where service providers have not yet billed or where billing terms do not align with the timing of the work performed as of the period-end. These costs mainly include third-party clinical management or clinical research organization (CRO), laboratory analysis, and investigator fees. Accrual estimates may be based on vendor communications to obtain pending invoices and/or estimates for services performed during the period. In some cases, these estimates require judgment, drawing on an understanding of research and development programs, services provided during the period, prior experience, and, where applicable, the expected duration of third-party contracts. Actual costs upon settlement may differ significantly from the accrued amounts in the Company's consolidated financial statements, though historical estimates have not differed materially from actual costs.

Liability Related to the Sale of Future Royalties—Based on its evaluation of the agreement terms, the Company classifies the liability related to the sale of future royalties as a debt financing. The Company records the obligations at their carrying value using the effective interest method. In order to amortize the sale of future royalties, the Company utilizes the prospective method to estimate the future royalties to be paid by the Company to the counterparty over the life of the arrangement. Under the prospective method, a new effective interest rate is determined based on the revised estimate of remaining cash flows. The new rate is the discount rate that equates the present value of the revised estimate of remaining cash flows with the carrying amount of the debt, and it will be used to recognize non-cash interest expense for the remaining periods. The Company periodically assesses the amount and the timing of expected royalty payments using a combination of internal projections and forecasts from external sources. The estimates of future net product sales (and resulting royalty payments) are based on key assumptions including population, penetration, probability of success and sales price, among others. To the extent such payments are greater or less than the Company's initial estimates or the timing of such payments is different than its original estimates, the Company will prospectively adjust the amortization of the royalty financing obligations and the effective interest rate.

RESULTS OF OPERATIONS

The following data summarizes the Company's results of operations for the following periods indicated:

	Year Ended September 30,		
	2024	2023	2022
	(in thousands, except per share amounts)		
Revenue	$ 3,551	$ 240,735	$ 243,231
Operating loss	$ (601,080)	$ (205,002)	$ (178,507)
Net loss attributable to Arrowhead Pharmaceuticals, Inc.	$ (599,493)	$ (205,275)	$ (176,063)
Net loss per share (diluted) attributable to Arrowhead Pharmaceuticals, Inc.	$ (5.00)	$ (1.92)	$ (1.67)

Year Ended September 30, 2024 Compared to Year Ended September 30, 2023

Revenue

Total revenue for the year ended September 30, 2024 decreased to $3.6 million, 98.5%, from the same period of 2023. The changes were primarily driven by decreased revenue recognition associated with the Company's license and collaboration agreements during the year ended September 30, 2024. The Company has evaluated each agreement in accordance with FASB Topic 808–*Collaborative Arrangements* and Topic 606-*Revenue for Contracts from Customers*. See Note 2 — Collaboration and License Agreements of the Notes to Consolidated Financial Statements of Part IV, "Item 15. Exhibits and Financial Statement Schedules."

Takeda: In October 2020, Takeda and the Company entered into the Takeda License Agreement. The Company determined that they key deliverables included the license and specific R&D services. Given the specialized and unique nature of the R&D services, the Company concluded that these deliverables represent one combined performance obligation. The Company allocated the total $300.0 million initial transaction price to its one distinct performance obligation for the fazirsiran license and the associated Takeda R&D Services. Revenue was recognized using the input method (based on actual patient visits completed versus total estimated visits completed for the ongoing SEQUOIA and AROAAT2002 clinical studies). The Phase 2 study visits for patients in the SEQUOIA and AROAAT2002 studies concluded by December 31, 2023, and the Company has substantially completed its performance obligation under the Takeda License Agreement. As such, all revenue has been fully recognized as of December 31, 2023.

During the fiscal year of 2023, the Company recorded $162.5 million of revenue, including a $40.0 million milestone payment by dosing the first patient in the Phase 3 REDWOOD clinical study of fazirsiran.

GSK: On December 11, 2023, GSK and the Company entered into the GSK-HBV Agreement. Under the GSK-HBV Agreement, GSK received a worldwide, exclusive license to develop and commercialize daplusiran/tomligisiran (GSK5637608, formerly JNJ-3989). Daplusiran/tomligisiran had previously been licensed to Janssen in October 2018. Under the terms of the GSK-HBV Agreement, the Company received $2.7 million during fiscal year 2024 upon signing the GSK-HBV Agreement.

On November 22, 2021, GSK and the Company entered into the GSK-HSD License Agreement. Under the GSK-HSD License Agreement, GSK has received an exclusive license for GSK-4532990. The Company has completed its performance obligation related to this agreement, and the upfront payment of $120.0 million was fully recognized in the year ended September 30, 2022. Further, during fiscal year 2023, the Company recorded a $30.0 million milestone payment by dosing the first patient in a Phase 2b trial under GSK-HSD License Agreement.

Horizon/Amgen: During the fiscal year of 2023, the Company recognized $6.7 million of the total $40.0 million upfront payment received in July 2021, which was recognized on a straight-line basis over the timeframe for completing the Horizon R&D Services, concluding in the first quarter of 2023. There was also $1.5 million of reimbursable costs. Horizon enrolled the first subject in December 2022 in a Phase 1 randomized, placebo-controlled trial to assess the safety, tolerability, pharmacokinetics and pharmacodynamics of HZN-457, triggering a $15.0 million milestone payment to the Company which was paid in the second quarter of fiscal 2023. Further, Amgen enrolled the first subject in its Phase 3 trial of olpasiran, which triggered a $25.0 million milestone payment to the Company which was paid in the second quarter of fiscal 2023. On October 6, 2023, Amgen Inc. completed its acquisition of Horizon and subsequently notified the Company of Amgen's intent to terminate the HZN-457 license. Horizon exercised its right to terminate the Horizon License Agreement for convenience, which took effect on December 21, 2023.

Operating Expenses

The analysis below details the operating expenses and discusses the expenditures of the Company within the major expense categories. For purposes of comparison, the amounts for the years ended September 30, 2024 and 2023 are shown in the tables below.

Research and Development (R&D) Expenses

R&D expenses are related to the Company's research and development discovery efforts and related candidate costs, which are comprised primarily of outsourced costs related to the manufacturing of clinical supplies, toxicity/efficacy studies and clinical trial expenses. Internal costs primarily relate to discovery operations at the Company's research facilities in California and Wisconsin, including facility costs and laboratory-related expenses. The Company does not separately track R&D expenses by individual research and development projects, or by individual drug candidates. The Company operates in a cross-functional manner across projects and does not separately allocate facilities-related costs, candidate costs, discovery costs, compensation expenses, depreciation and amortization expenses, and other expenses related to research and development activities.

The following table provides details of research and development expenses:

(in thousands)	Year Ended September 30, 2024	% of Expense Category	Year Ended September 30, 2023	% of Expense Category	Increase (Decrease) $	Increase (Decrease) %
Candidate costs	$ 259,280	51 %	$ 162,459	46 %	$ 96,821	60 %
R&D discovery costs	74,150	15 %	55,586	15 %	18,564	33 %
Salaries	96,418	19 %	73,668	21 %	22,750	31 %
Facilities related	25,782	5 %	16,267	5 %	9,515	58 %
Total research and development expense, excluding non-cash expense	$ 455,630	90 %	$ 307,980	87 %	$ 147,650	48 %
Stock compensation	33,586	7 %	34,332	10 %	(746)	(2)%
Depreciation and amortization	16,654	3 %	10,876	3 %	5,778	53 %
Total research and development expense	$ 505,870	100 %	$ 353,188	100 %	$ 152,682	43 %

Candidate costs increased $96.8 million, or 60%, for the year ended September 30, 2024 compared to the same period of 2023. This increase was primarily due to the additional progression of the Company's pipeline of candidates into and through clinical trials, which resulted in higher manufacturing, outsourced clinical trial, and toxicity study costs.

R&D discovery costs increased $18.6 million, or 33%, for the year ended September 30, 2024 compared to the same period of 2023. This increase was primarily driven by the growth of the Company's discovery efforts and continued advancement into novel therapeutic areas and tissue types, along with rising costs associated with central nervous system (CNS) studies and lab supplies.

Salaries consist of salary, bonuses, payroll taxes, and related benefits for the Company's R&D personnel. Salaries expense increased $22.8 million, or 31%, for the year ended September 30, 2024 compared to the same period of 2023. The increase was primarily due to an increase in R&D headcount that has occurred as the Company has expanded its pipeline of candidates, in addition to annual salary increases.

Facilities-related expense includes lease costs for the Company's research and development facilities in San Diego, California and in Madison and Verona, Wisconsin. These expenses increased $9.5 million, or 58%, for the year ended September 30, 2024 compared to the same period of 2023. The increase was primarily due to full-year expenses such as utilities and repair and maintenance charges associated with the new facilities in San Diego, California and Verona, Wisconsin

Stock compensation expense, a non-cash expense, is based upon the valuation of stock options and restricted stock units granted to employees. Stock compensation expense decreased $0.7 million, or 2%, for the year ended September 30, 2024 compared to the same period of 2023. The decrease was primarily due to the cancellation of awards upon the departure of employees.

Depreciation and amortization expense, a non-cash expense, relates to depreciation on building, lab equipment and leasehold improvements. Depreciation and amortization expense increased $5.8 million, or 53% for the year ended September 30, 2024 compared to the same period of 2023. The increase was primarily attributed to higher leasehold improvements due to completion of the development of the San Diego facility. Additionally, as of December 31, 2023, the Company completed the build out of one of its laboratory and office facilities in Verona, Wisconsin, and commenced depreciation.

The Company anticipates these R&D expenses to continue to increase as its pipeline of candidates grows and progresses to later phase clinical trials, in addition to inflationary pressure on goods and services and the labor market.

General & Administrative Expenses

The following table provides details of general and administrative expenses:

(in thousands)	Year Ended September 30, 2024	% of Expense Category	Year Ended September 30, 2023	% of Expense Category	Increase (Decrease) $	Increase (Decrease) %
Salaries	$ 27,589	28 %	$ 22,999	25 %	$ 4,590	20 %
Professional, outside services, and other	24,733	25 %	20,720	22 %	4,013	19 %
Facilities related	4,116	4 %	3,415	4 %	701	21 %
Total general & administrative expense, excluding non-cash expense	$ 56,438	57 %	$ 47,134	51 %	$ 9,304	20 %
Stock compensation	40,382	41 %	43,798	47 %	(3,416)	(8)%
Depreciation/amortization	1,941	2 %	1,617	2 %	324	20 %
Total general & administrative expense	$ 98,761	100 %	$ 92,549	100 %	$ 6,212	7 %

Salaries expense increased $4.6 million, or 20%, for the year ended September 30, 2024 compared to the same period of 2023. The increase was driven by the combination of annual salary increases and increased headcount required to support the Company's growth.

Professional, outside services, and other expenses include costs related to legal, audit, consulting, patent filings, business insurance, other external services, as well as travel, communication, and technology expenses. This expense increased $4.0 million, or 19%, for the year ended September 30, 2024 compared to the same period of 2023. The increase was primarily driven by legal services associated with patent applications and intellectual property matters, as well as other professional services.

Facilities related expense primarily includes rental costs and other facilities-related costs for the Company's corporate headquarters in Pasadena, California.

Stock compensation expense, a non-cash expense, is based on the valuation of stock options and restricted stock units granted to employees. This expense decreased by $3.4 million, or 8%, for the year ended September 30, 2024 compared to the same period of 2023. The decrease was mainly due to lower compensation costs related to performance awards, as the timing of these expenses can vary based on the achievement of related performance targets.

Depreciation and amortization expense, a noncash expense, was primarily related to amortization of leasehold improvements for the Company's corporate headquarters.

Other than with respect to the stock compensation costs described above, the Company anticipates these general and administrative expenses to increase as its pipeline of candidates grows and progresses to later phase clinical trials including commercialization efforts, in addition to inflationary pressure on goods and services and the labor market.

Other Income (Expense)

Other income (expense) is primarily related to interest income and expense. Other expense increased $9.9 million for the year ended September 30, 2024 compared to the same period of 2023. The increase was mainly due to non-cash interest expense associated with the liability related to the sale of future royalties and the Credit Facility, partially offset by higher income from increased investment yields due to higher average cash balance.

Year Ended September 30, 2023 Compared to Year Ended September 30, 2022

See "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" of the Company's Form 10-K for the year ended September 30, 2023 for a discussion of changes in its results of operations from the year ended September 30, 2023 to the year ended September 30, 2022.

LIQUIDITY AND CAPITAL RESOURCES

The Company has historically financed its operations through the sale of its equity securities, credit facility, revenue from its licensing and collaboration agreements, and the sale of certain future royalties. Research and development activities have required significant investment since the Company's inception and are expected to continue to require significant cash expenditure as the Company's pipeline continues to expand and matures into later stage clinical trials, including commercialization efforts. Additionally, the Company expanded its facilities in Verona, Wisconsin and leased additional facilities in San Diego, California. Each of these expansions is designed to increase the Company's internal manufacturing and discovery capabilities and requires significant capital investment. For further information on the Company's capital needs, see the section titled "Risks Related to Our Financial Condition" in "Item 1A. Risk Factors" of this Annual Report on Form 10-K.

The Company's cash, cash equivalents and restricted cash was $102.7 million at September 30, 2024 compared to $110.9 million at September 30, 2023. Cash invested in available-for-sale securities was $578.3 million at September 30, 2024 compared to $292.7 million at September 30, 2023.

On December 2, 2022, the Company entered into an open market sale agreement ("the Open Market Sale Agreement"), pursuant to which the Company may, from time to time, sell up to $250.0 million in shares of the Company's common stock through Jefferies LLC, acting as the sales agent and/or principal, in an at-the-market offering. As of September 30, 2024, no shares have been issued under the Open Market Sale Agreement.

On January 2, 2024, the Company entered into an underwriting agreement with Jefferies LLC, BofA Securities, Inc., and Cowen and Company, LLC, as representatives of the several underwriters. The Company issued 15,790,000 shares of common stock at an offering price of $28.50 per share. The aggregate purchase price paid by investors was $450.0 million and the Company received net proceeds of $429.3 million after deducting advisory fees and offering expenses.

Further, the Company entered into the Credit Facility, which provides for a senior secured term loan facility of $500.0 million, which includes $400.0 million funded on the closing date with an additional $100.0 million at the Company's option during the seven-year term of the agreement. The Company received net proceeds of $388.9 million, after issuance costs as of September 30, 2024. This is discussed further in Note 14, Financing Agreements of the Notes to the Company's Consolidated Financial Statements in Part IV, "Item 15. Exhibits and Financial Statement Schedules." If the Company repays in full the aggregate principal outstanding under the Credit Facility and such payment in full occurs on or prior to August 7, 2028, the Company will be required to make an additional payment to the lenders under the Credit Facility on such date in an amount necessary for the lenders to achieve a multiple of two times on invested capital of the aggregate principal amount funded on the Closing Date. If such payment in full occurs after August 7, 2028, the Company will be required to make an additional payment to the lenders under the Credit Facility on such date in an amount necessary for the lenders to achieve the greater of the multiple of two times on invested capital of the aggregate principal amount funded on the Closing Date and the present value of all interest payments that would have been payable from such date through the maturity date of the Credit Facility.

The Company believes its current financial resources are sufficient to fund its operations through at least the next twelve months from the date of the issuance of these consolidated financial statements.

The following table presents a summary of cash flows:

	Year Ended September 30,		
	2024	2023	2022
	(in thousands)		
Cash Flow from:			
Operating activities	$ (462,851)	$ (153,890)	$ (136,131)
Investing activities	(420,072)	(96,155)	(5,417)
Financing activities	870,520	253,053	65,186
Net (decrease) increase in cash, cash equivalents and restricted cash	$ (12,403)	$ 3,008	$ (76,362)
Cash, cash equivalents and restricted cash at end of period	$ 102,685	$ 110,891	$ 108,005

During the year ended September 30, 2024, cash flow used in operating activities was $462.9 million, which was primarily due to the ongoing expenses related to the Company's research and development programs and general and administrative expenses. Cash used in investing activities amounted to $420.1 million, which was primarily attributable to capital expenditures of $141.5 million and investment purchases of $720.9 million, offset by proceeds from sales and maturities of investments of $442.3 million. Cash provided by financing activities of $870.5 million was related to cash

received from the issuance of common stock, the Credit Facility, a milestone payment from Royalty Pharma, and stock option exercises. (See Note 13 — Liability Related to the Sale of Future Royalties and Note 14 — Financing Agreement of Notes to Consolidated Financial Statements of Part IV, "Item 15. Exhibits and Financial Statement Schedules.").

During the year ended September 30, 2023, cash flow used in operating activities was $153.9 million, which was primarily due to the ongoing expenses related to the Company's research and development programs and general and administrative expenses, partially offset by the receipt of the $110.0 million from collaboration and license agreements. Cash used in investing activities was $96.2 million, which was primarily related to the purchase of property and equipment of $176.7 million, offset by net proceeds of $80.6 million from maturities of securities. Cash provided by financing activities of $253.1 million was primarily related to the $250.0 million payment from Royalty Pharma as well as cash received from stock option exercises.

See "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" of the Company's Form 10-K for the year ended September 30, 2023 for a discussion of cash flows from the year ended September 30, 2022.

Contractual Obligations

Based on the Company's current operating plan, it believes that cash, cash equivalents and short-term investments as of September 30, 2024 will be sufficient to satisfy its near-term capital and operating needs. Recent and expected working and other capital requirements include the items described below.

- For information related to the Company's future commitments for its collaboration and licensing agreements, see Note 2 of Notes to the Company's Consolidated Financial Statements of Part IV, "Item 15. Exhibits and Financial Statement Schedules."
- Amounts related to future lease payments for operating lease obligations at September 30, 2024 totaled $117.4 million, with $6.3 million expected to be paid within the next 12 months.
- Cash outflows for capital expenditures related to the manufacturing facility build-out at Verona, Wisconsin were $136.9 million in 2024 and $134.8 million in 2023. The Company expects to spend an additional $8.0 million to complete the build out of the facilities.
- A secured term loan facility of $500.0 million, which includes $400.0 million funded on the closing date with an additional $100.0 million at the Company's option during the seven-year term of the agreement. The Company does not expect to make payments within the next 12 months. See Note 14 of Notes to the Company's Consolidated Financial Statements of Part IV, "Item 15. Exhibits and Financial Statement Schedules."
- The liability related to the sale of future royalties were $341.4 million at September 30, 2024, for which the Company does not expect to make payments within the next 12 months. See Note 13 of Notes to the Company's Consolidated Financial Statements of Part IV, "Item 15. Exhibits and Financial Statement Schedules."
- Commitments related to the Company's clinical, manufacturing and business operation related agreements totaled $471.9 million as of September 30, 2024. However, many of these agreements are cancellable.
- The Company has not entered into, nor does it currently have, any off-balance sheet arrangements (as defined under SEC rules).

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

The Company is subject to market risk exposures primarily due to its investing activities. The primary market risk exposure is change in interest rates. Adverse changes to rates may occur due to changes in the liquidity of a market or to changes in market perceptions of creditworthiness and risk tolerance.

The Company's investment criteria are governed by its Investment Policy. The Company primarily invests its excess cash in securities of reputable financial institutions, corporations, and US government agencies with strong credit ratings. On September 30, 2023, the Company changed the classification of its investment securities from held-to-maturity to available-for-sale. This change enables the Company to sell securities to diversify its portfolio, reduce exposure to market risks, and provide flexibility to meet cash flow needs and new investment opportunities. Due to the relatively short-term nature of the investments that the Company holds, it does not believe that the results of operations or cash flows would be affected to any significant degree by a sudden change in market interest rates relative to its investment portfolio.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The information required by this item is included in Item 15 of this Annual Report on Form 10-K.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

The Company maintains disclosure controls and procedures designed to ensure that information required to be disclosed in its reports filed under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in the SEC rules and forms, and that such information is accumulated and communicated to its management, including its Chief Executive Officer and Chief Financial Officer, as appropriate, to allow for timely decisions regarding required disclosure. In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management necessarily was required to apply its judgment in evaluating the cost benefit relationship of possible controls and procedures.

As required by Rule 13a-15(b) of the Exchange Act, the Company carried out an evaluation, under the supervision and with the participation of its management, including its Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of the Company's disclosure controls and procedures as of the end of the period covered by this Annual Report on Form 10-K. Based on the foregoing, the Company's Chief Executive Officer and Chief Financial Officer concluded that the Company's disclosure controls and procedures were effective at the reasonable assurance level.

Management's Annual Report on Internal Control over Financial Reporting

The Company's management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act. The Company's internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of its Consolidated Financial Statements for external purposes in accordance with GAAP.

This process includes those policies and procedures that:

(i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the Company's assets;

(ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, and that receipts and expenditures are being made only in accordance with authorizations of the Company's management and directors; and

(iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the Company's financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of the internal control over financial reporting to future periods are subject to risk that controls may become inadequate because either conditions change or the degree of compliance with policies or procedures may deteriorate.

Management has assessed the effectiveness of the Company's internal control over financial reporting as of September 30, 2024. In making this assessment, the Company used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control-Integrated Framework (2013). Based on this assessment, management concluded that the Company's internal control over financial reporting was effective as of September 30, 2024.

KPMG LLP, the independent registered public accounting firm that audited the Consolidated Financial Statements included in this 2024 Annual Report on Form 10-K, has issued an audit report on the effectiveness of the Company's internal control over financial reporting as of September 30, 2024, which is included herein.

Changes in Internal Control Over Financial Reporting

There has been no change in the Company's internal control over financial reporting during the Company's most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting. The Company regularly evaluates its controls and procedures and makes improvements in the design and effectiveness of established controls and procedures and the remediation of any deficiencies which may be identified during this process.

ITEM 9B. OTHER INFORMATION

(a) ***License and Collaboration Agreement***

On November 25, 2024, the Company entered into an Exclusive License and Collaboration Agreement (the "Collaboration Agreement") with Sarepta Therapeutics, Inc. ("Sarepta") for the co-development and commercialization of multiple clinical and preclinical programs in rare, genetic diseases of the muscle, central nervous system, and the lungs.

Under the Collaboration Agreement, Sarepta has received an exclusive worldwide license to the Company's ARO-DUX4, ARO-DM1, ARO-MMP7, and ARO-ATXN2 clinical stage programs. Sarepta has also received an exclusive sublicensable worldwide license to the Company's ARO-HTT, ARO-ATXN1, and ARO-ATXN3 preclinical stage programs.

Pursuant to the Collaboration Agreement, Sarepta will be able to select up to six new targets for which the Company will perform discovery, optimization and preclinical development. Upon completion of the Company's preclinical activities, Sarepta will receive an exclusive license to the Company's product-specific intellectual property rights covering those compounds and be wholly responsible for clinical development and commercialization of each compound.

Under the terms of the Collaboration Agreement, the Company expects to receive $500.0 million as an upfront payment and $250.0 million to be paid in annual installments of $50.0 million over 5 years. The Company is also eligible to receive $300.0 million in near-term payments associated with the continued enrollment of certain cohorts of a Phase 1/2 study, which the Company is on track to achieve.

Further, for each of the 13 programs, the Company is eligible to receive development milestone payments between $110.0 million and $180.0 million per program and sales milestone payments between $500.0 million and $700.0 million per program. The Company is also eligible to receive tiered royalties on net sales of licensed products of up to the low double digits.

Closing of the Collaboration Agreement is subject to clearance under the Hart-Scott Rodino Antitrust Improvements Act.

The foregoing description of the Collaboration Agreement does not purport to be complete and is qualified in its entirety by reference to the Collaboration Agreement, a copy of which will be filed with the Company's Quarterly Report on Form 10-Q for the quarter ended December 31, 2024.

Stock Purchase Agreement

In connection with the Collaboration Agreement, on November 25, 2024, the Company entered into a Stock Purchase Agreement (the "Stock Purchase Agreement") with an affiliate of Sarepta (the "Purchaser") for a private placement of shares of common stock of the Company (the "Private Placement"). Pursuant to the Stock Purchase Agreement, the Company sold 11,926,301 shares of common stock (the "Shares"), at a price per Share of $27.2507, for an aggregate value of approximately $325.0 million. The Private Placement is expected to close concurrently with the Collaboration Agreement (the "Closing").

The Stock Purchase Agreement contains customary representations and warranties of the Company, on the one hand, and the Purchaser, on the other hand, and customary conditions to closing. The Stock Purchase Agreement provides that at any time following the Closing, the Purchaser may elect to exchange any or all of its Shares for pre-funded warrants to purchase shares of common stock of the Company, substantially in the form attached to the Stock Purchase Agreement.

At the Closing, the Company will enter into an Investor Rights Agreement (the "Investor Rights Agreement") with the Purchaser, which provides that the Company will appoint Doug Ingram to the board of directors of the Company effective as of the Closing. In addition, the Company will register the resale of the Shares pursuant to the Investor Rights Agreement. The Company is required to prepare and file a registration statement with the Securities and Exchange Commission no later than 30 days following the Closing.

The Company has also agreed to, among other things, indemnify the Purchaser, their officers, directors, members, employees, partners, managers, stockholders, affiliates, investment advisors and agents under the registration statement

from certain liabilities and pay certain fees and expenses incident to the Company's obligations under the Investor Rights Agreement.

The securities to be issued and sold to Purchaser under the Stock Purchase Agreement will not be registered under the Securities Act of 1933, as amended (the Securities Act) in reliance on the exemption from registration provided by Section 4(a)(2) of the Securities Act and/or Rule 506 of Regulation D promulgated thereunder, or under any state securities laws. The Company relied on this exemption from registration based in part on representations made by the Purchaser. The securities may not be offered or sold in the United States absent registration or an applicable exemption from registration requirements. This Annual Report on Form 10-K is not an offer to sell or the solicitation of an offer to buy the securities described herein.

The foregoing descriptions of the Stock Purchase Agreement and the form of Investor Rights Agreement do not purport to be complete and are qualified in their entirety by reference to the Stock Purchase Agreement and the form of Investor Rights Agreement, copies of which are filed as Exhibits 10.48 and 4.6 to this Annual Report on Form 10-K, respectively, and are incorporated by reference herein.

Amendment to Credit Facility

Also on November 26, 2024, the Company entered into an amendment to the Credit Facility (the "Amendment") to modify, subject to certain conditions, amongst other things, the requirements to make prepayments of the loans under the Credit Facility with respect to the transactions contemplated by the Collaboration Agreement and the Stock Purchase Agreement.

The foregoing description of the Amendment does not purport to be complete and is qualified in its entirety by reference to the Amendment, a copy of which will be filed with the Company's Quarterly Report on Form 10-Q for the quarter ending December 31, 2024.

Securities Purchase Agreement

On November 25, 2024, the Company entered into a Securities Purchase Agreement (the "Securities Purchase Agreement") with an institutional and accredited investor (the "Warrant Purchaser") for a private placement of pre-funded warrants to purchase shares of common stock with an exercise price of $0.001 per share. Pursuant to the Securities Purchase Agreement, the Company sold pre-funded warrants to purchase up to 917,441 shares of common stock at a purchase price of $27.2497 per pre-funded warrant, for an aggregate value of approximately $25.0 million. The transaction is expected to close on or about November 27, 2024 (the "Warrant Closing").

The Securities Purchase Agreement contains customary representations and warranties of the Company, on the one hand, and the Purchasers, on the other hand, and customary conditions to closing. At the Warrant Closing, the Company will enter into a Registration Rights Agreement (the Registration Rights Agreement) with the Warrant Purchaser, which provides that the Company will register the resale of the shares of common stock underlying the pre-funded warrants pursuant to the Registration Rights Agreement. The Company is required to prepare and file a registration statement with the Securities and Exchange Commission no later than 30 days following the Warrant Closing.

The Company has also agreed to, among other things, indemnify the Purchaser, their officers, directors, members, employees, partners, managers, stockholders, affiliates, investment advisors and agents under the registration statement from certain liabilities and pay certain fees and expenses incident to the Company's obligations under the Registration Rights Agreement.

The securities to be issued and sold to Warrant Purchaser under the Securities Purchase Agreement will not be registered under the Securities Act in reliance on the exemption from registration provided by Section 4(a)(2) of the Securities Act and/or Rule 506 of Regulation D promulgated thereunder, or under any state securities laws. The Company relied on this exemption from registration based in part on representations made by the Warrant Purchaser. The securities may not be offered or sold in the United States absent registration or an applicable exemption from registration requirements. This Annual Report on Form 10-K is not an offer to sell or the solicitation of an offer to buy the securities described herein.

The foregoing descriptions of the Securities Purchase Agreement, the form of Registration Rights Agreement and the form of Pre-Funded Warrant do not purport to be complete and are qualified in their entirety by reference to the Securities Purchase Agreement, the form of Registration Rights Agreement and the form of Pre-Funded Warrant, copies of which are filed as Exhibits 10.49, 4.7 and 4.8 to this Annual Report on Form 10-K, respectively, and are incorporated by reference herein.

(b) Trading Plans

During the fiscal quarter ended September 30, 2024, the following directors and officers (as defined in Exchange Act Rule 16a-1(f)) adopted certain trading plans intended to satisfy Rule 10b5-1(c):

Name	Title	Adoption or Termination Date	Plan Start Date	Plan End Date	Shares Vesting and Subject to Sell-To-Cover [1]	Other Shares Being Sold (Subject to Certain Conditions)
Adeoye Olukotun	Board Member	09/24/2024	12/24/2024	06/24/2025	n/a	5,465
Christopher Anzalone	President and Chief Executive Officer	08/16/2024	03/03/2025	12/31/2025	n/a	351,726
Christopher Anzalone	President and Chief Executive Officer	08/22/2024	12/04/2024	12/31/2026	2,082,892	n/a
Christopher Anzalone	President and Chief Executive Officer	09/16/2024	01/02/2025	12/31/2026	96,566	n/a
Douglass Given	Board Member	09/12/2024	12/16/2024	12/31/2024	n/a	5,547
James Hamilton	Chief of Discovery and Translational Medicine	08/19/2024	12/04/2024	11/28/2025	n/a	30,000

(1) This column indicates the total number of shares vesting, but the 10b5-1 Plan provides for the sale of only those shares necessary to satisfy payment of applicable withholding taxes.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information called for by this Item will be incorporated by reference from the Company's Definitive Proxy Statement, under the headings Proposal One — Election of Directors, Equity Compensation Plan Information, Corporate Governance, Environmental and Social Commitment, Executive Compensation, and, if applicable, Delinquent Section 16(a) Reports — to be filed for the Company's 2025 Annual Meeting of Stockholders (the "Definitive Proxy Statement").

ITEM 11. EXECUTIVE COMPENSATION

The information called for by this Item will be incorporated by reference from the Definitive Proxy Statement, under the heading Executive Compensation.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information called for by this Item will be incorporated by reference from the Definitive Proxy Statement, under the heading Voting Securities of Principal Stockholders and Management.

ITEM 13. CERTAIN RELATIONSHIPS, RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

The information called for by this Item will be incorporated by reference from the Definitive Proxy Statement, under the headings Review and Approval of Related-Party Transactions and Certain Relationships and Related Transactions, and Director Independence.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information called for by this Item will be incorporated by reference from the Definitive Proxy Statement, under the heading Audit Fees.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

The following documents are filed as part of this Annual Report on Form 10-K:

(1) Financial Statements.

See Index to Financial Statements and Schedule on page F-1.

(2) Financial Statement Schedules.

See Index to Financial Statements and Schedule on page F-1. All other schedules are omitted as the required information is not present or is not present in amounts sufficient to require submission of the schedule, or because the information required is included in the Consolidated Financial Statements or notes thereto.

(3) Exhibits.

The following exhibits are filed (or incorporated by reference herein) as part of this Annual Report on Form 10-K:

		Incorporated by Reference Herein	
Exhibit Number	**Description**	**Form**	**Date**
1.1	Open Market Sale Agreement, dated as of December 2, 2022, by and between Arrowhead Pharmaceuticals, Inc. and Jefferies LLC	Current Report on Form 8-K as Exhibit 1.1	December 2, 2022
2.1†	Stock and Asset Purchase Agreement between Arrowhead Research Corporation and Roche entities, dated October 21, 2011	Annual Report on Form 10-K as Exhibit 2.1	December 20, 2011
2.2†	Asset Purchase and Exclusive License Agreement between Arrowhead Research Corporation and Novartis Institutes for BioMedical Research, Inc., dated March 3, 2015	Quarterly Report on Form 10-Q, as Exhibit 2.1	May 11, 2015
3.1	Amended and Restated Certificate of Incorporation (incorporated by reference from Exhibit 3.3 of the Company's Form 8-K filed on April 6, 2016)	Current Report on Form 8-K as Exhibit 3.3	April 6, 2016
3.2	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of Arrowhead Pharmaceuticals, Inc. (incorporated by reference from Exhibit 3.2 of the Company's Form 10-Q filed on May 2, 2023)	Quarterly Report on Form 10-Q, as Exhibit 3.2	May 2, 2023
3.3	Second Amended and Restated Bylaws (incorporated by reference from Exhibit 3.1 of the Company's Form 8-K filed on January 30, 2023)	Current Report on Form 8-K as Exhibit 3.2	January 30, 2023
4.1	Form of Common Stock Certificate of Arrowhead Pharmaceuticals, Inc.	Current Report on Form 8-K, as Exhibit 4.1	April 6, 2016
4.2	Form of Indenture	Registration Statement on Form S-3, as Exhibit 4.2	December 2, 2019
4.3	Rights Agreement dated as of March 21, 2017, between the Company and Computershare Trust Company, N.A., as rights agent, which includes as Exhibit B the Form of Rights Certificate	Current Report on Form 8-K, as Exhibit 4.1	March 23, 2017
4.4	Description of Registrant's Securities	Annual Report on Form 10-K, as Exhibit 4.4	November 25, 2019
4.5	Registration Rights Agreement by and between Arrowhead Pharmaceuticals, Inc. and Johnson & Johnson Innovation-JJDC, Inc., dated October 3, 2018	Quarterly Report on Form 10-Q, as Exhibit 10.4	February 7, 2019
4.6*	Form of Investor Rights Agreement by and between Company and Sarepta Therapeutics Investments, Inc. (included as Exhibit A in Exhibit 10.48)		

Exhibit Number	Description	Incorporated by Reference Herein	
		Form	Date
4.7*	Form of Registration Rights Agreement by and between Company and Avoro Life Sciences Fund LLC (included as Exhibit B in Exhibit 10.49)		
4.8*	Form of Pre-Funded Warrant for Avoro Life Sciences Fund LLC		
10.1**	Arrowhead Research Corporation 2004 Equity Incentive Plan, as amended	Schedule 14C, as Annex B	January 12, 2012
10.2**	Arrowhead Research Corporation 2013 Incentive Plan	Schedule 14C, as Annex A	December 20, 2013
10.3**	Form of Stock Option Agreement for use with the 2013 Incentive Plan	Current Report on Form 8-K, as Exhibit 10.1	February 12, 2014
10.4**	Form of Restricted Stock Unit Agreement for use with the 2013 Incentive Plan	Current Report on Form 8-K, as Exhibit 10.2	February 12, 2014
10.5**	Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan	Schedule 14A, as Exhibit A	January 28, 2021
10.6**	Form of RSU Agreement for Officers and Certain Other Employees (Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan- Inducement Award)	Registration Statement on Form S-8, as Exhibit 99.1	December 22, 2021
10.7**	Form of RSU Agreement for Officers and Certain Other Employees (Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan)	Registration Statement on Form S-8, as Exhibit 99.1	February 28, 2024
10.8**	Form of RSU Agreement for Employees (Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan - Inducement Award)	Registration Statement on Form S-8, as Exhibit 99.2	December 22, 2021
10.9**	Form of RSU Agreement for Employees (Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan)	Registration Statement on Form S-8, as Exhibit 99.2	February 28, 2024
10.10**	Form of Stock Option Grant (Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan- Inducement Award)	Registration Statement on Form S-8, as Exhibit 99.3	December 22, 2021
10.11**	Form of Stock Option Grant (Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan)	Annual Report on Form 10-K, as Exhibit 10.11	November 29, 2023
10.12**	Executive Incentive Plan, adopted December 12, 2006	Annual Report on Form 10-K, as Exhibit 10.11	December 14, 2006
10.13**	Arrowhead Pharmaceuticals, Inc. Inducement Plan	Quarterly Report on Form 10-Q, as Exhibit 10.1	May 9, 2024
10.14**	Employment Agreement between Arrowhead and Dr. Christopher Anzalone, dated June 11, 2008	Current Report on Form 8-K, as Exhibit 10.1	June 13, 2008
10.15**	Amendment to Employment Agreement between Arrowhead and Dr. Christopher Anzalone, effective May 12, 2009	Annual Report on Form 10-K, as Exhibit 10.8	December 22, 2009
10.16†	Collaboration Agreement by and among Alnylam Pharmaceuticals, Inc. and F. Hoffmann-La Roche Ltd and Hoffman-La Roche Inc., dated October 29, 2009 †	Annual Report on Form 10-K, as Exhibit 10.36	December 20, 2011
10.17†	Non-Exclusive License Agreement between Arrowhead Research Corporation and Roche entities, dated October 21, 2011†	Annual Report on Form 10-K, as Exhibit 10.33	December 20, 2011
10.18†	License Agreement by and between Alnylam Pharmaceuticals, Inc., Arrowhead Research Corporation and Arrowhead Madison, Inc.†	Quarterly Report on Form 10-Q, as Exhibit 10.1	August 12, 2014
10.19†	Second Collaboration and Licensing Agreement between Arrowhead Pharmaceuticals, Inc. and Amgen Inc., dated September 28, 2016†	Annual Report on Form 10-K, as Exhibit 10.19	December 14, 2016

Exhibit Number	Description	Incorporated by Reference Herein	
		Form	Date
10.20	Common Stock Purchase Agreement between the Company and Amgen Inc., dated September 28, 2016	Amendment No. 1 to the Registration Statement on Form S-3, as Exhibit 10.1)	November 25, 2016
10.21†	License Agreement by and between Arrowhead Pharmaceuticals, Inc. and Janssen Pharmaceuticals, Inc., dated October 3, 2018†	Quarterly Report on Form 10-Q, as Exhibit 10.1	February 7, 2019
10.22†	Amendment No. 1 to License Agreement by and between Arrowhead Pharmaceuticals, Inc. and Janssen Pharmaceuticals, Inc., dated December 18, 2018†	Annual Report on Form 10-K, as Exhibit 10.19	November 25, 2019
10.23†	Amendment No. 2 to License Agreement by and between Arrowhead Pharmaceuticals, Inc. and Janssen Pharmaceuticals, Inc., dated February 4, 2019†	Annual Report on Form 10-K, as Exhibit 10.20	November 25, 2019
10.24†	Amended and Restated License Agreement by and between Arrowhead Pharmaceuticals, Inc. and GlaxoSmithKline Intellectual Property (No. 3) Limited, dated December 11, 2023	Quarterly Report on Form 10-Q, as Exhibit 10.1	August 8, 2024
10.25	Stock Purchase Agreement by and between Johnson & Johnson Innovation-JJDC, Inc. and Arrowhead Pharmaceuticals, Inc., dated October 3, 2018	Quarterly Report on Form 10-Q, as Exhibit 10.3	February 7, 2019
10.26†	Exclusive License and Co-Funding Agreement by and between Arrowhead Pharmaceuticals, Inc. and Takeda Pharmaceuticals U.S.A., Inc., dated October 7, 2020†	Quarterly Report on Form 10-Q, as Exhibit 10.1	February 4, 2021
10.27	First Amendment to Exclusive License and Co-Funding Agreement by and between Arrowhead Pharmaceuticals, Inc. and Takeda Pharmaceuticals U.S.A., Inc. dated March 15, 2022	Quarterly Report on Form 10-Q, as Exhibit 10.1	May 10, 2022
10.28†	Collaboration and License Agreement by and between Arrowhead Pharmaceuticals, Inc. and Horizon Therapeutics Ireland DAC, dated June 18, 2021†	Quarterly Report on Form 10-Q, as Exhibit 10.4	August 5, 2021
10.29	Collaboration and License Agreement by and between Arrowhead Pharmaceuticals, Inc. and Glaxosmithkline Intellectual Property, dated November 22, 2021	Quarterly Report on Form 10-Q, as Exhibit 10.1	February 2, 2022
10.30	Royalty Purchase Agreement, dated as of November 9, 2022, by and between Arrowhead Pharmaceuticals, Inc. and Royalty Pharma Investments 2019 ICAV	Quarterly Report on Form 10-Q, as Exhibit 10.1	February 6, 2023
10.31	Lease Agreement between University Research Park, Incorporated and Arrowhead Madison, Inc., dated January 8, 2016	Quarterly Report on Form 10-Q, as Exhibit 10.1	February 9. 2016
10.32	Amendment No. 1 to Lease Agreement between Arrowhead Madison, Inc. and University Research Park, Incorporated, dated October 22, 2018	Annual Report on Form 10-K, as Exhibit 10.23	November 23, 2020
10.33	Amendment No. 2 to Lease Agreement between Arrowhead Madison, Inc. and University Research Park, Incorporated, dated January 10, 2019	Annual Report on Form 10-K, as Exhibit 10.24	November 23, 2020
10.34	Amendment No. 3 to Lease Agreement between Arrowhead Madison, Inc. and University Research Park, Incorporated, dated January 11, 2019	Annual Report on Form 10-K, as Exhibit 10.25	November 23, 2020
10.35	Amendment No. 4 to Lease Agreement between Arrowhead Madison, Inc. and University Research Park, Incorporated, dated September 19, 2019	Annual Report on Form 10-K, as Exhibit 10.26	November 23, 2020
10.36	Amendment No. 5 to Lease Agreement between Arrowhead Madison, Inc. and University Research Park, Incorporated, dated May 14, 2020	Annual Report on Form 10-K, as Exhibit 10.27	November 23, 2020
10.37	Amendment No. 6 to Lease Agreement by and between Arrowhead Madison, Inc. and University Research Park, dated November 23, 2020	Quarterly Report on Form 10-Q, as Exhibit 10.3	February 4, 2021

Exhibit Number	Description	Incorporated by Reference Herein	
		Form	Date
10.38	Amendment No. 7 to Lease Agreement by and between Arrowhead Madison, Inc. and University Research Park, dated December 9, 2020	Quarterly Report on Form 10-Q, as Exhibit 10.4	February 4, 2021
10.39*	Amendment No. 8 to Lease Agreement by and between Arrowhead Madison, Inc. and University Research Park, dated August 26, 2022		
10.40*	Amendment No. 9 to Lease Agreement by and between Arrowhead Madison, Inc. and University Research Park, dated April 3, 2023		
10.41*	Amendment No. 10 to Lease Agreement by and between Arrowhead Madison, Inc. and University Research Park, dated June 28, 2023		
10.42*	Amendment No. 11 to Lease Agreement by and between Arrowhead Madison, Inc. and University Research Park, dated September 13, 2024		
10.43	Office Lease by and between 177 Colorado Owner LLC and Arrowhead Pharmaceuticals, Inc., dated April 17, 2019	Quarterly Report on Form 10-Q, as Exhibit 10.1	August 5, 2019
10.44	First Amendment to Office Lease by and between Arrowhead Pharmaceuticals, Inc. and 177 Colorado Owner LLC, dated October 23, 2020	Quarterly Report on Form 10-Q, as Exhibit 10.2	February 4, 2021
10.45	Lease Agreement by and between Arrowhead Pharmaceuticals, Inc. and ARE-SD Region No. 72, LLC, dated November 19, 2021	Quarterly Report on Form 10-Q, as Exhibit 10.2	February 2, 2022
10.46	First Amendment to Lease Agreement by and between Arrowhead Pharmaceuticals, Inc. and ARE-SD Region No. 72, LLC, dated September 26, 2023	Annual Report on Form 10-K, as Exhibit 10.39	November 29, 2023
10.47*†	Financing Agreement by and between Company and Sixth Street Lending Partners, dated August 7, 2024		
10.48*	Stock Purchase Agreement by and between Company and Sarepta Therapeutics Investments, Inc., dated November 25, 2024		
10.49*	Securities Purchase Agreement by and between Company and Avoro Life Sciences Fund LLC, dated November 25, 2024		
16.1	Letter from Rose, Snyder & Jacobs LLP, dated December 4, 2023	Current Report on Form 8-K, as Exhibit 16.1	December 5, 2023
19.1*	Arrowhead Pharmaceuticals, Inc. Insider Trading Policy		
21.1*	List of Subsidiaries		
23.1*	Consent of Independent Public Registered Accounting Firm		
23.2*	Consent of Independent Public Registered Accounting Firm		
31.1*	Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002		
31.2*	Certification of Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002		
32.1***	Certification by Chief Executive Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002		
32.2***	Certification by Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002		
97**	Arrowhead Pharmaceuticals, Inc. Compensation Recoupment (Clawback) Policy, dated November 20, 2023	Annual Report on Form 10-K, as Exhibit 97	November 29, 2023
101.INS*	Inline XBRL Taxonomy Extension Instance Document		

Exhibit Number	Description	Incorporated by Reference Herein	
		Form	Date
101.SCH*	Inline XBRL Taxonomy Extension Schema Document		
101.CAL*	Inline XBRL Taxonomy Extension Calculation Linkbase Document		
101.LAB*	Inline XBRL Taxonomy Extension Label Linkbase Document		
101.PRE*	Inline XBRL Taxonomy Extension Presentation Linkbase Document		
101.DEF*	Inline XBRL Taxonomy Extension Definition Linkbase Document		
104*	The cover page from the Company's Annual Report on Form 10-K for the year ended September 30, 2024, formatted in Inline XBRL (included as Exhibit 101)		

* Filed herewith
** Indicates compensation plan, contract or arrangement.
*** Furnished herewith
† Certain portions of this exhibit were redacted by means of marking such portions with asterisks because the identified portions are (i) not material and (ii) treated as private or confidential by the Company.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURE

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized.

Dated: November 26, 2024

ARROWHEAD PHARMACEUTICALS, INC.

By: /s/ Christopher Anzalone
Christopher Anzalone
Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report on Form 10-K has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated:

Signature	Title	Date
/s/ Christopher Anzalone **Christopher Anzalone**	Chief Executive Officer, President and Director (Principal Executive Officer)	November 26, 2024
/s/ Kenneth A. Myszkowski **Kenneth A. Myszkowski**	Chief Financial Officer (Principal Financial and Accounting Officer)	November 26, 2024
/s/ Douglass Given **Douglass Given**	Director, Chairman of the Board of Directors	November 26, 2024
/s/ Mauro Ferrari **Mauro Ferrari**	Director	November 26, 2024
/s/ Michael S. Perry **Michael S. Perry**	Director	November 26, 2024
/s/ William Waddill **William Waddill**	Director	November 26, 2024
/s/ Adeoye Olukotun **Adeoye Olukotun**	Director	November 26, 2024
/s/ Victoria Vakiener **Victoria Vakiener**	Director	November 26, 2024
/s/ Hongbo Lu **Hongbo Lu**	Director	November 26, 2024

INDEX TO FINANCIAL STATEMENTS AND SCHEDULE

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and
Stockholders of Arrowhead Pharmaceuticals, Inc.

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheet of Arrowhead Pharmaceuticals, Inc. and subsidiaries (the Company) as of September 30, 2024, the related consolidated statement of operations and comprehensive loss, stockholders' equity, and cash flows for the year then ended, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of September 30, 2024, and the results of its operations and its cash flows for the year ended, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of September 30, 2024, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated November 26, 2024 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion
These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing separate opinions on the critical audit matter or on the accounts or disclosures to which they relate.

Sufficiency of audit evidence over valuation of future royalty sales liability

As discussed in Note 13 to the consolidated financial statements, the Company records the obligations under the Royalty Pharma Agreement with Royalty Pharma Investments (RPI) at carrying value using the effective interest method. The Company amortizes the sale of future royalties utilizing the prospective method to estimate future royalties to be paid by the Company to RPI over the life of the arrangement. The Company periodically assesses the amount and timing of expected royalty payments using a combination of internal projections and forecasts from external sources. To the extent such payments differ from the Company's initial estimates, the Company will prospectively adjust the amortization of the royalty obligation and the effective interest rate. The estimate of the carrying value of the liability related to the sale of future royalties is derived from the estimate of future sales of olpasiran and the probability of success assumption. The estimate of future sales of olpasiran is based on key assumptions such as patient population, market penetration, olpasiran

sales price, and the comparable guideline drug. The liability related to the sale of future royalties was $341,361 thousand as of September 30, 2024.

We identified the evaluation of the sufficiency of audit evidence over the determination of the carrying value of the liability related to the sale of future royalties as a critical audit matter. Subjective auditor judgment was required to evaluate the sufficiency of audit evidence obtained because of the level of audit effort associated with evaluating the carrying value of the liability related to the sale of future royalties.

The following are the primary procedures we performed to address this critical audit matter. We applied auditor judgment to determine the nature and extent of procedures to be performed over the evaluation of the carrying value of the liability related to the sale of future royalties. We evaluated the design and tested the operating effectiveness of certain internal controls related to management's valuation process, including the determination of the key assumptions into the carrying value of the liability related to the sale of future royalties as described above. We assessed the patient population and market penetration assumptions by comparing to independently sourced external market and industry data. We performed sensitivity analyses over the estimated olpasiran sales price and probability of success using independently sourced external market and industry data and evaluated the impact of changes in those assumptions on the carrying value of the liability related to the sale of future royalties. We assessed the reasonableness of the comparable guideline drug by evaluating against drugs similar to olpasiran in the marketplace. We evaluated the sufficiency of audit evidence obtained by assessing the cumulative results of the audit procedures performed and potential bias in the accounting estimate, including the appropriateness of the nature and extent of such evidence.

KPMG LLP
We have served as the Company's auditor since 2024.

San Diego, CA
November 26, 2024

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and
Stockholders of Arrowhead Pharmaceuticals, Inc.

Opinion on Internal Control over Financial Reporting
We have audited Arrowhead Pharmaceuticals, Inc. and subsidiaries' (the Company) internal control over financial reporting as of September 30, 2024, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of September 30, 2024, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheet of the Company as of September 30, 2024, the related consolidated statement of operations and comprehensive loss, stockholders' equity, and cash flows for the year then ended, and the related notes (collectively, the consolidated financial statements), and our report dated November 26, 2024 expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion
The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting
A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.
Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

KPMG LLP
San Diego, CA
November 26, 2024

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and
Stockholders of Arrowhead Pharmaceuticals, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheet of Arrowhead Pharmaceuticals, Inc., and Subsidiaries (the Company) as of September 30, 2023, and the related consolidated statements of operations and comprehensive income (loss), stockholders' equity, and cash flows for each of the years in the two-year period ended September 30, 2023, and the related notes (collectively referred to as the financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of September 30, 2023, and the results of its operations and its cash flows for each of the years in the two-year period ended September 30, 2023, in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Rose, Snyder & Jacobs LLP
We have served as the Company's auditor from 2004 to 2023.

Encino, California
November 29, 2023

Arrowhead Pharmaceuticals, Inc.
Consolidated Balance Sheets
(in thousands, except per share amounts)

	September 30,	
	2024	**2023**
ASSETS		
Current assets:		
Cash, cash equivalents and restricted cash	$ 102,685	$ 110,891
Available-for-sale securities, at fair value	578,276	292,735
Prepaid expenses	9,537	8,813
Other current assets	4,973	4,033
Total current assets	695,471	416,472
Property, plant and equipment, net	386,032	290,262
Intangible assets, net	8,562	10,262
Right-of-use assets	45,255	45,297
Other assets	4,482	3,259
Total Assets	**$ 1,139,802**	**$ 765,552**
LIABILITIES, NONCONTROLLING INTEREST AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 11,388	$ 35,866
Accrued expenses	63,017	39,763
Accrued payroll and benefits	21,989	17,963
Lease liabilities	6,342	10,563
Deferred revenue	—	866
Other liabilities	432	435
Total current liabilities	103,168	105,456
Long-term liabilities:		
Lease liabilities, net of current portion	111,027	104,608
Liability related to the sale of future royalties	341,361	268,326
Credit facility	393,183	—
Total long-term liabilities	845,571	372,934
Commitments and contingencies (Note 7)		
Noncontrolling interest and stockholders' equity:		
Common stock, $0.001 par value: Authorized 290,000 shares; issued and outstanding 124,376 and 107,312 shares	217	200
Additional paid-in capital	1,806,000	1,300,395
Accumulated other comprehensive income (loss)	4,750	(3,222)
Accumulated deficit	(1,625,523)	(1,026,030)
Total Arrowhead Pharmaceuticals, Inc. stockholders' equity	185,444	271,343
Noncontrolling interest	5,619	15,819
Total noncontrolling interest and stockholders' equity	191,063	287,162
Total Liabilities, Noncontrolling Interest and Stockholders' Equity	**$ 1,139,802**	**$ 765,552**

The accompanying notes are an integral part of these consolidated financial statements.

Arrowhead Pharmaceuticals, Inc.
Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except per share amounts)

	Year Ended September 30,		
	2024	**2023**	**2022**
Revenue	$ 3,551	$ 240,735	$ 243,231
Operating expenses:			
Research and development	505,870	353,188	297,307
General and administrative	98,761	92,549	124,431
Total operating expenses	604,631	445,737	421,738
Operating loss	(601,080)	(205,002)	(178,507)
Other income (expense):			
Interest income	22,720	15,299	5,033
Interest expense	(32,352)	(18,326)	—
Other, net	(1,748)	1,538	765
Total other (expense) income	(11,380)	(1,489)	5,798
Loss before income tax expense and noncontrolling interest	(612,460)	(206,491)	(172,709)
Income tax (benefit) expense	(2,767)	2,784	3,785
Net loss including noncontrolling interest	(609,693)	(209,275)	(176,494)
Net loss attributable to noncontrolling interest, net of tax	(10,200)	(4,000)	(431)
Net loss attributable to Arrowhead Pharmaceuticals, Inc.	**$ (599,493)**	**$ (205,275)**	**$ (176,063)**
Net loss per share attributable to Arrowhead Pharmaceuticals, Inc.:			
Basic	$ (5.00)	$ (1.92)	$ (1.67)
Diluted	$ (5.00)	$ (1.92)	$ (1.67)
Weighted-average shares used in calculating			
Basic	119,784	106,750	105,426
Diluted	119,784	106,750	105,426
Other comprehensive loss, net of tax:			
Unrealized gains (losses) on available-for-sale securities	3,775	(2,964)	—
Foreign currency translation adjustments	4,197	(122)	(67)
Comprehensive loss	**$ (601,721)**	**$ (212,361)**	**$ (176,561)**

The accompanying notes are an integral part of these consolidated financial statements.

Arrowhead Pharmaceuticals, Inc.
Consolidated Statements of Stockholders' Equity
(in thousands)

	Common Stock	Amount ($)	Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Non-controlling Interest	Totals
Balance at September 30, 2021	**104,327**	**$ 197**	**$ 1,053,386**	**$ (69)**	**$ (644,692)**	**$ —**	**$ 408,822**
Stock-based compensation	—	—	120,893	—	—	—	120,893
Exercise of stock options	606	—	5,185	—	—	—	5,185
Common stock - restricted stock units vesting	1,027	1	(1)	—	—	—	—
Foreign currency translation adjustments	—	—	—	(67)	—	—	(67)
Interest in joint venture	—	—	39,750	—	—	20,250	60,000
Net loss	—	—	—	—	(176,063)	(431)	(176,494)
Balance at September 30, 2022	**105,960**	**$ 198**	**$ 1,219,213**	**$ (136)**	**$ (820,755)**	**$ 19,819**	**$ 418,339**

	Common Stock	Amount ($)	Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Non-controlling Interest	Totals
Balance at September 30, 2022	**105,960**	**$ 198**	**$ 1,219,213**	**$ (136)**	**$ (820,755)**	**$ 19,819**	**$ 418,339**
Stock-based compensation	—	—	78,130	—	—	—	78,130
Exercise of stock options	439	1	3,053	—	—	—	3,054
Common stock - restricted stock units vesting	913	1	(1)	—	—	—	—
Unrealized losses on available-for-sale securities	—	—	—	(2,964)	—	—	(2,964)
Foreign currency translation adjustments	—	—	—	(122)	—	—	(122)
Net loss	—	—	—	—	(205,275)	(4,000)	(209,275)
Balance at September 30, 2023	**107,312**	**$ 200**	**$ 1,300,395**	**$ (3,222)**	**$ (1,026,030)**	**$ 15,819**	**$ 287,162**

	Common Stock	Amount ($)	Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Non-controlling Interest	Totals
Balance at September 30, 2023	**107,312**	**$ 200**	**$ 1,300,395**	**$ (3,222)**	**$ (1,026,030)**	**$ 15,819**	**$ 287,162**
Stock-based compensation	—	—	73,968	—	—	—	73,968
Exercise of stock options	226	—	2,389	—	—	—	2,389
Common stock - restricted stock units vesting	1,048	1	(1)	—	—	—	—
Common stock issued, net of offering costs	15,790	16	429,249	—	—	—	429,265
Unrealized gains on available-for-sale securities	—	—	—	3,775	—	—	3,775
Foreign currency translation adjustments	—	—	—	4,197	—	—	4,197
Net loss	—	—	—	—	(599,493)	(10,200)	(609,693)
Balance at September 30, 2024	**124,376**	**$ 217**	**$ 1,806,000**	**$ 4,750**	**$ (1,625,523)**	**$ 5,619**	**$ 191,063**

The accompanying notes are an integral part of these consolidated financial statements.

Arrowhead Pharmaceuticals, Inc.
Consolidated Statements of Cash Flows
(in thousands)

	Year Ended September 30,		
	2024	**2023**	**2022**
CASH FLOWS FROM OPERATING ACTIVITIES:			
Net loss	$ (609,693)	$ (209,275)	$ (176,494)
Adjustments to reconcile net loss to net cash flow from operating activities:			
Stock-based compensation	73,968	78,130	120,893
Depreciation and amortization	18,595	12,493	10,421
(Accretion) Amortization of note premiums/discounts	(3,244)	(2,017)	2,910
Non-cash interest expense on liability related to the sale of future royalties	23,035	18,326	—
Non-cash interest expense on credit facility	9,317	—	—
Realized loss on investments	80	—	4,432
Changes in operating assets and liabilities:			
Accounts receivable	—	1,410	8,845
Prepaid expenses and other current assets	(1,664)	11,603	(19,291)
Accounts payable	(5,536)	32,998	(6,589)
Accrued expenses	32,117	(14,965)	17,750
Deferred revenue	(866)	(129,183)	(112,501)
Operating lease, net	2,240	46,590	13,428
Other	(1,200)	—	65
Net cash used in operating activities	(462,851)	(153,890)	(136,131)
CASH FLOWS FROM INVESTING ACTIVITIES:			
Purchases of property, plant and equipment	(141,469)	(176,737)	(52,777)
Purchases of investments	(720,947)	(246,141)	(223,391)
Proceeds from sales and maturities of investments	442,344	326,723	270,751
Net cash used in investing activities	(420,072)	(96,155)	(5,417)
CASH FLOWS FROM FINANCING ACTIVITIES:			
Proceeds from the issuance of common stock, net of offering costs	429,265	—	—
Proceeds from the sale of future royalties	50,000	250,000	—
Proceeds from credit facility	392,000	—	—
Payment of debt issuance costs	(3,134)	—	—
Proceeds from the exercises of stock options	2,389	3,053	5,186
Proceeds from investment in joint venture	—	—	60,000
Net cash provided by financing activities	870,520	253,053	65,186
Net (decrease) increase in cash, cash equivalents and restricted cash	(12,403)	3,008	(76,362)
Effect of exchange rate on cash, cash equivalents and restricted cash	4,197	(122)	(67)
CASH, CASH EQUIVALENTS AND RESTRICTED CASH:			
BEGINNING OF PERIOD	110,891	108,005	184,434
END OF PERIOD	$ 102,685	$ 110,891	$ 108,005
Supplementary disclosure of cash flows:			
Income Taxes Paid	$ (3,744)	$ —	$ (2)
Supplementary disclosure of non-cash investing activities:			
Capital expenditures included in accounts payable and accrued expenses	$ 4,206	$ 14,044	$ 17,578
Supplementary disclosure of non-cash financing activities:			
Debt issuance costs included in accrued expenses	$ 5,000	$ —	$ —

The accompanying notes are an integral part of these consolidated financial statements.

NOTE 1. ORGANIZATION AND SIGNIFICANT ACCOUNTING POLICIES

General

Arrowhead Pharmaceuticals, Inc. and its subsidiaries (referred to herein collectively as the "Company") are primarily engaged in developing medicines that treat intractable diseases by silencing the genes that cause them. Using a broad portfolio of RNA chemistries and efficient modes of delivery, the Company's therapies trigger the RNA interference mechanism to induce rapid, deep and durable knockdown of target genes. RNA interference ("RNAi") is a mechanism present in living cells that inhibits the expression of a specific gene, thereby affecting the production of a specific protein. The Company's RNAi-based therapeutics may leverage this natural pathway of gene silencing to target and shut down specific disease-causing genes.

The following table presents the Company's current pipeline:

Therapeutic Area	Name	Stage	Product Rights
Cardiometabolic	plozasiran	Phase 3	Arrowhead
	zodasiran	Phase 2b	Arrowhead
	olpasiran	Phase 3	Amgen
Pulmonary	ARO-RAGE	Phase 1/2a	Arrowhead
	ARO-MUC5AC	Phase 1/2a	Arrowhead
	ARO-MMP7	Phase 1/2a	Arrowhead
Liver	GSK-4532990	Phase 2b	GSK
	fazirsiran	Phase 3	Takeda and Arrowhead
	daplusiran/tomligisiran	Phase 2	GSK
	ARO-PNPLA3	Phase 1	Arrowhead
	ARO-C3	Phase 1/2a	Arrowhead
	ARO-CFB	Phase 1/2a	Arrowhead
	ARO-INHBE	Phase 1/2a	Arrowhead
Muscle	ARO-DUX4	Phase 1/2a	Arrowhead
	ARO-DM1	Phase 1/2a	Arrowhead
Central Nervous System (CNS)	ARO-ATXN2	Phase 1/2a	Arrowhead

The Company operates lab facilities in California and Wisconsin, where its research and development activities, including the development of RNAi therapeutics, take place. The Company's principal executive offices are located in Pasadena, California.

Consolidation and Basis of Presentation

The Consolidated Financial Statements include the accounts of Arrowhead Pharmaceuticals, Inc. and its subsidiaries (wholly-owned subsidiaries and a variable interest entity for which the Company is the primary beneficiary). Subsidiaries refer to Arrowhead Madison, Inc., Visirna Therapeutics, Inc. ("Visirna"), and Arrowhead Australia Pty Ltd. For subsidiaries in which the Company owns or is exposed to less than 100% of the economics, the Company records net loss attributable to noncontrolling interests in its consolidated statements of operations equal to the percentage of the economic or ownership interests retained in such entity by the respective noncontrolling party.

The Consolidated Financial Statements have been prepared in conformity with U.S. generally accepted accounting principles ("GAAP"). All intercompany transactions and balances have been eliminated. Certain prior period amounts have been reclassified to conform with the current period presentation.

Liquidity

The Company's primary sources of financing have been through the sale of its equity securities, credit facility, revenue from its licensing and collaboration agreements and the sale of certain future royalties. Research and development activities have required significant investment since the Company's inception and are expected to continue to require significant cash expenditure in the future, particularly as the Company's pipeline of drug candidates and its headcount have

both expanded. Additionally, significant capital investment will be required as the Company's pipeline matures into later stage clinical trials, including commercialization efforts.

At September 30, 2024, the Company had $102.7 million in cash, cash equivalents and restricted cash ($3.5 million in restricted cash) and $578.3 million in available-for-sale securities to fund operations. During the year ended September 30, 2024, the Company's cash, cash equivalents and restricted cash and investments balance increased by $277.3 million. This increase was primarily driven by net proceeds from the credit facility and the underwritten offering as discussed below, offset by ongoing expenses related to the Company's research and development programs, general and administrative costs, and capital expenditures.

On August 7, 2024, the Company entered into a financing agreement (the "Financing Agreement") with Sixth Street Lending Partners, as representatives of several lenders. The Financing Agreement provides for a senior secured term loan facility of $500 million, which includes $400.0 million funded on the closing date with an additional $100.0 million at the Company's option during the seven-year term. The Company received net proceeds of $388.9 million, after issuance costs as of September 30, 2024. See Note 14.

On January 2, 2024, the Company entered into an underwriting agreement with Jefferies LLC, BofA Securities, Inc., and Cowen and Company, LLC, as representatives of the several underwriters. The Company issued 15,790,000 shares of common stock at an offering price of $28.50 per share. The aggregate purchase price paid by investors was $450.0 million, and the Company received net proceeds of $429.3 million after deducting advisory fees and offering expenses.

In total, the Company is eligible to receive up to $2.7 billion in developmental, regulatory and sales milestones, and may receive various royalties on net sales from its licensing and collaboration agreements, subject to the terms and conditions of those agreements. The revenue recognition for these collaboration agreements is discussed further in Note 2.

Summary of Significant Accounting Policies

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. On an ongoing basis, the Company evaluates its estimates, judgments and assumptions. The Company bases its estimates on historical experience and on various other assumptions that it believes are reasonable, the results of which form the basis for making judgments about the carrying values of assets, liabilities and equity and the amount of revenue and expense. Actual results could materially differ from those estimates.

Cash, Cash Equivalents and Restricted Cash

All highly liquid interest-bearing investments are classified as cash equivalents. These investments mainly include commercial paper with maturities of three months or less when purchased. The carrying value of these cash equivalents approximate fair value.

There was $3.5 million and $7.9 million restricted cash at September 30, 2024 and 2023, respectively, that is primarily held as collateral associated with letters of credit for the Company's facility leases.

Investments

The Company classified all of its investments in debt securities as available-for-sale and as current assets as they represent the investment of funds available for current operations as of September 30, 2024 and 2023. The available-for-sale investments may consist of investment-grade interest bearing instruments, primarily money market accounts, government-sponsored enterprise securities, corporate bonds and/or commercial paper, which are accounted for at fair value. Dividends from these funds were automatically re-invested. Changes in fair values are reported as unrealized gains or losses and are recorded in the Company's consolidated statement of operations and comprehensive loss.

The Company evaluates its investments for impairment. If an unrealized loss is determined to be other-than-temporary, it is written off as a realized loss through the consolidated statements of operations and comprehensive loss. The Company's methodology of assessing other-than-temporary impairments is based on security-specific analysis as of the balance sheet date and considers various factors, including the length of time to maturity and the extent to which the fair value has been less than the cost, recoverability of future cash flows as compared to carrying value of the security, the financial condition and the near-term prospects of the issuer, and the Company's ability and intent to hold the security. If a decline in fair value of investments is determined to be other-than-temporary, the securities are written down to fair value

as the new cost basis and the amount of the write down is accounted for as realized losses. The Company did not recognize any other-than-temporary impairments of its investment for the years ended September 30, 2024, 2023, and 2022.

Concentration of Credit Risk

Financial instruments that potentially expose the Company to concentration of credit risk primarily consist of cash, cash equivalents and restricted cash and investments. As of September 30, 2024 and 2023, the Company's investments were primarily invested in money market funds, commercial paper, and corporate debt securities through highly rated financial institutions. The Company has established guidelines relative to diversification and maturities that maintain safety and liquidity. The Company periodically reviews and modifies these guidelines to maximize trends in yields and interest rates without compromising safety and liquidity. The Company also maintains several bank accounts primarily at two financial institutions for its operations. These accounts are insured by the Federal Deposit Insurance Corporation (FDIC) for up to $250,000 per institution.

Property, Plant and Equipment

Property, plant and equipment are recorded at cost, net of accumulated depreciation. Depreciation expense is recorded on a straight-line basis over the estimated useful lives of the assets. Leasehold improvements are amortized over the lesser of the expected useful life or the remaining lease term. Construction in progress reflects amounts incurred for construction or improvements of property, plant and equipment that have not been placed in service. Upon disposition, the cost and accumulated depreciation of assets retired or sold are removed from the respective asset category, and any gain or loss is recognized in the Company's consolidated statement of operations and comprehensive loss.

The estimated useful lives of property, plant and equipment are as follows (in years):

	Estimated Useful Lives
Building	39
Research equipment	5 to 10
Furniture	7
Computers and software	3 to 5
Leasehold improvements	3 to 15

The Company periodically assesses long-lived assets or asset groups, including property, plant and equipment, for recoverability when events or changes in circumstances indicate that their carrying amounts may not be recoverable. If the Company identifies an indicator of impairment, the Company assesses recoverability by comparing the carrying amount of the asset to the sum of the undiscounted cash flows expected to result from the use and the eventual disposal of the asset. An impairment loss is recognized when the carrying amount is not recoverable and is measured as the excess of carrying value over fair value. There were no impairment charges during the years ended September 30, 2024, 2023, and 2022.

Intangible Assets Subject to Amortization

Intangible assets subject to amortization include certain patents and license agreements. The Company evaluates intangible assets for impairment annually or whenever events or changes in circumstances indicate that it is more likely than not that the carrying amount of intangible assets may exceed their implied fair values. No impairment charges were recorded during the years ended September 30, 2024, 2023, and 2022.

Leases

The Company determines whether a contract is, or contains, a lease at inception. All of the Company's leases are classified as operating leases. Leases with terms greater than one-year are recognized on the Company's consolidated balance sheets as right-of-use assets that represent the Company's right to use an underlying asset for the lease term, and lease liabilities that represent its obligation to make lease payments arising from the lease. Lease assets and liabilities are recognized at the lease commencement date based on the estimated present value of lease payments over the expected lease term. As of September 30, 2024 and 2023, the Company is not reasonably certain that it will exercise renewal options for any lease facilities. Therefore, these options are not included in the right-of-use assets and liabilities.

The interest rate implicit in lease contracts is typically not readily determinable. As such, the Company utilizes the appropriate incremental borrowing rate, which is the rate incurred to borrow on a collateralized basis an amount equal to the lease payments over a similar term and in a similar economic environment. The Company records expense to recognize lease payments on a straight-line basis over the expected lease term. Costs determined to be variable and not based on an index or rate are not included in the measurement of the lease liability and are expensed as incurred.

Clinical Accruals

The Company accrues liabilities for products received or services incurred, particularly for ongoing clinical trials, where service providers have not yet billed or where billing terms do not align with the timing of the work performed as of the period-end. These costs mainly include third-party clinical management or clinical research organization (CRO), laboratory analysis, and investigator fees. Accrual estimates may be based on vendor communications to obtain pending invoices and/or estimates for services performed during the period. In some cases, these estimates require judgment, drawing on an understanding of research and development programs, services provided during the period, prior experience, and, where applicable, the expected duration of third-party contracts. Actual costs upon settlement may differ significantly from the accrued amounts in the Company's consolidated financial statements, though historical estimates have not differed materially from actual costs.

Revenue Recognition

The revenue standard provides a five-step framework for recognizing revenue as control of promised goods or services is transferred to a customer at an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. To determine revenue recognition for arrangements that it determines are within the scope of the revenue standard, the Company performs the following five steps: (i) identify the contract; (ii) identify the performance obligations; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) the Company satisfies a performance obligation. At contract inception, the Company assesses whether the goods or services promised within each contract are distinct and, therefore, represent a separate performance obligation, or whether they are not distinct and are combined with other goods and services until a distinct bundle is identified. The Company then determines the transaction price, which typically includes upfront payments and any variable consideration that it determines is probable to not cause a significant reversal in the amount of cumulative revenue recognized when the uncertainty associated with the variable consideration is resolved. The Company then allocates the transaction price to each performance obligation and recognizes the associated revenue when (or as) each performance obligation is satisfied.

The Company recognizes the transaction price allocated to upfront license payments as revenue upon delivery of the license to the customer and resulting ability of the customer to use and benefit from the license, if the license is determined to be distinct from the other performance obligations identified in the contract. These other performance obligations are typically to perform research and development services for the customer, often times relating to the candidate that the customer is licensing. If the license is not considered to be distinct from other performance obligations, the Company assesses the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied at a point in time or over time. If the performance obligation is satisfied over time, the Company then determines the appropriate method of measuring progress for purposes of recognizing revenue from license payments. The Company evaluates the measure of progress each reporting period and, if necessary, adjusts the related revenue recognition.

Typically, the Company's collaboration agreements entitle it to additional payments upon the achievement of milestones or royalties on sales. The milestones are generally categorized into three types: development milestones, generally based on the initiation of toxicity studies or clinical trials; regulatory milestones, generally based on the submission, filing or approval of regulatory applications such as a New Drug Application ("NDA") in the United States; and sales-based milestones, generally based on meeting specific thresholds of sales in certain geographic areas. The Company evaluates whether it is probable that the consideration associated with each milestone or royalty will not be subject to a significant reversal in the cumulative amount of revenue recognized. Amounts that meet this threshold are included in the transaction price using the most likely amount method, whereas amounts that do not meet this threshold are excluded from the transaction price until they meet this threshold. At the end of each subsequent reporting period, the Company re-evaluates the probability of a significant reversal of the cumulative revenue recognized for its milestones and royalties, and, if necessary, adjusts its estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect revenues and net income in the Company's consolidated statements of operations and comprehensive loss. Typically, milestone payments and royalties are achieved after the Company's performance obligations associated with the collaboration agreements have been completed and after the customer has assumed responsibility for the respective clinical or preclinical program. Milestones or royalties achieved after the Company's performance obligations have been completed are recognized as revenue in the period the milestone or royalty was achieved. If a milestone payment is achieved during the performance period, the milestone payment would be recognized as revenue to the extent performance had been completed at that point, and the remaining balance would be recorded as deferred revenue.

The revenue standard requires the Company to assess whether a significant financing component exists in determining the transaction price. The Company performs this assessment at the onset of its licensing or collaboration agreements. Typically, a significant financing component does not exist because the customer is paying for a license or services in advance with an upfront payment. Additionally, future royalty payments are not substantially within the control of the Company or the customer.

Further, the revenue standard requires the Company to allocate the arrangement consideration on a relative standalone selling price basis for each performance obligation after determining the transaction price of the contract and identifying the performance obligations to which that amount should be allocated. The relative standalone selling price is defined in the revenue standard as the price at which an entity would sell a promised good or service separately to a customer. If other observable transactions in which the Company has sold the same performance obligation separately are not available, the Company estimates the standalone selling price of each performance obligation. Key assumptions to determine the standalone selling price may include forecasted revenues, development timelines, reimbursement rates for personnel costs, discount rates and probabilities of technical and regulatory success.

Whenever the Company determines that goods or services promised in a contract should be accounted for as a combined performance obligation over time, the Company determines the period over which the performance obligations will be performed and revenue will be recognized. Revenue is recognized using the input method; Labor hours, costs incurred or patient visits in clinical trials are typically used as the measure of performance. Significant management judgment is required in determining the level of effort required under an arrangement and the period over which the Company is expected to complete its performance obligations. If the Company determines that the performance obligation is satisfied over time, any upfront payment received is initially recorded as deferred revenue on its consolidated balance sheets.

Certain judgments affect the application of the Company's revenue recognition policy. For example, the Company records short-term (less than one year) and long-term (over one year) deferred revenue based on its best estimate of when such revenue will be recognized. This estimate is based on the Company's current operating plan and, the Company may recognize a different amount of deferred revenue over the next 12-month period if its plan changes in the future.

Collaborative Arrangements

The Company analyzes its collaborative arrangements to assess whether such arrangements involve joint operating activities performed by parties that are both active participants in the activities and exposed to significant risks and rewards, and therefore are within the scope of Financial Accounting Standards Board ("FASB") Topic 808 - *Collaborative Arrangements*. For collaborative arrangements that contain multiple elements, the Company determines which units of account are deemed to be within the scope of Topic 808 and which units of account are more reflective of a vendor-customer relationship, and therefore are within the scope of Topic 606 - *Revenue for Contracts from Customers*. For units of account that are accounted for pursuant to Topic 808, an appropriate recognition method is determined and applied consistently, either by analogy to appropriate accounting literature or by applying a reasonable accounting policy election. For collaborative arrangements that are within the scope of Topic 808, the Company evaluates the income statement classification for presentation of amounts due to or owed from other participants associated with multiple units of account in a collaborative arrangement based on the nature of each activity. Payments or reimbursements that are the result of a collaborative relationship instead of a customer relationship, such as co-development and co-commercialization activities, are recorded as increases or decreases to research and development expense or general and administrative expense, as appropriate.

Research and Development Expenses

Costs and expenses that can be clearly identified as research and development are charged to expense as incurred. Included in research and development costs are operating costs, facilities, supplies, external services, clinical trial and manufacturing costs, overhead directly related to the Company's research and development operations, and costs to acquire technology licenses.

Stock-Based Compensation

Share-based compensation expenses for all stock grants are based on their estimated grant-date fair value. The fair value of stock option awards is estimated using the Black-Scholes option valuation model which requires the input of subjective assumptions to calculate the value of stock options. The Company uses historical data and other information to estimate the expected price volatility and the expected forfeiture rate for stock option awards. For restricted stock units, the value of the award is based on the Company's stock price at the grant date. For performance-based restricted stock unit awards, the value of the award is based on the Company's stock price at the grant date, with consideration given to the probability of the performance condition being achieved. Expense is recognized over the vesting period for all awards and commences at the grant date for time-based awards and upon the Company's determination that the achievement of such performance conditions is probable for performance-based awards. This determination requires significant judgment by management.

Income Taxes

Deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to differences between the financial reporting basis and the respective tax basis of the Company's assets and liabilities, and expected benefits of utilizing net operating loss, capital loss, and tax-credit carryforwards. The Company assesses the likelihood that its deferred tax assets will be realized and, to the extent management does not believe these assets are more likely than not to be realized, a valuation allowance is established. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates or laws is recognized in earnings in the period that includes the enactment date.

Variable Interest Entity ("VIE")

A VIE is an entity that, by design, either (i) lacks sufficient equity to permit the entity to finance its activities without additional subordinated financial support from other parties; or (ii) has equity investors that do not have the ability to make significant decisions relating to the entity's operations through voting rights, or do not have the obligation to absorb the expected losses, or do not have the right to receive the residual returns of the entity. The primary beneficiary of a VIE is required to consolidate the assets and liabilities of the VIE. The primary beneficiary is the party that has both (i) the power to direct the activities of the VIE that most significantly impact the VIE's economic performance, and (ii) the obligation to absorb losses or the right to receive benefits from the VIE that could potentially be significant to the VIE through its interest in the VIE.

On April 25, 2022, the Company entered into a license agreement with Visirna (Note 2) and consolidated Visirna's financial statements in which the Company has a direct controlling financial interest based on the VIE model.

The Company considers all the facts and circumstances, including its role in establishing Visirna and its ongoing rights and responsibilities to assess whether the Company has the power to direct the activities of Visirna. In general, the parties that make the most significant decisions affecting a VIE and have the right to unilaterally remove those decision-makers are deemed to have the power to direct the activities of a VIE.

The Company also considers all of its economic interests to assess whether the Company has the obligation to absorb losses of Visirna or the right to receive benefits from it that could potentially be significant to Visirna. This assessment requires the Company to apply judgment in determining whether these interests, in the aggregate, are considered potentially significant to Visirna. Factors considered in assessing the significance include: the design of Visirna, including its capitalization structure, subordination of interests, payment priority, and the reasons why the interests are held by the Company.

At Visirna's inception, the Company determined whether it was the primary beneficiary and if Visirna should be consolidated based on the facts and circumstances. The Company performs ongoing reassessments of the VIE based on reconsideration events and reevaluates whether a change to the consolidation is required. As of September 30, 2024, there were no events to be reconsidered in the consolidation.

Net Loss per Share

Net loss per share is computed using the weighted-average number of common shares outstanding during the period. Diluted earnings per share is computed using the weighted-average number of common shares and dilutive potential common shares outstanding during the period. Dilutive potential common shares primarily consist of stock options and restricted stock units outstanding.

During the years ended September 30, 2024, 2023 and 2022, the calculation of the effect of dilutive stock options and restricted stock units excluded all stock options and restricted stock units outstanding during the period due to their anti-dilutive effect.

Foreign Currency Translation Adjustments

One of the Company's wholly-owned subsidiaries' functional currencies is not the United States dollar, which is the Company's reporting currency. Assets and liabilities are translated at the exchange rate in effect at the balance sheet date. Revenues and expenses are translated at the average rate of exchange prevailing during the reporting period. Translation adjustments arising from the use of different exchange rates from period to period are included in the accumulated other comprehensive loss.

Segment Information

The Company operates as a single segment because its chief decision makers review operating results on an aggregate basis and manage its operations as a single operating segment.

Recent Accounting Pronouncements

In December 2023, the FASB issued Accounting Standard Update ("ASU") 2023-09, *Income Taxes (Topic 740): Improvements to Income Tax Disclosures*, to improve its income tax disclosure requirements. Under the guidance, entities must annually (1) disclose specific categories in the rate reconciliation and (2) provide additional information for reconciling items that meet a quantitative threshold. This guidance will become effective for the Company beginning on October 1, 2025. The Company does not expect any material impact on its consolidated financial statements and related disclosures resulting from applying this ASU.

In November 2023, the FASB issued ASU 2023-07, *Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures*, which is intended to improve reportable segment disclosure requirements, primarily through additional disclosures about significant segment expenses. The guidance requires public companies with a single reportable segment to provide all disclosures required under ASC 280. In addition, the guidance requires public companies to include in interim reports all disclosures related to a reportable segment's profit or loss and assets that are currently required in annual reports. The standard is effective for fiscal years beginning after December 15, 2023, and interim periods within fiscal years beginning after December 15, 2024, with early adoption permitted. The amendments should be applied retrospectively to all prior periods presented in the financial statements. The Company does not expect any material impact on its consolidated financial statements and related disclosures resulting from applying this ASU.

NOTE 2. COLLABORATION AND LICENSE AGREEMENTS

The following table provides a summary of revenue recognized:

	Year Ended September 30,		
	2024	2023	2022
		(in thousands)	
GSK	$ 2,685	$ 29,657	$ 124,764
Horizon	—	23,206	29,181
Takeda	866	162,516	85,834
Janssen	—	356	3,452
Amgen	—	25,000	—
Total	$ 3,551	$ 240,735	$ 243,231

The following table summarizes the balance of receivables and contract liabilities related to the Company's collaboration and license agreements:

	September 30,	
	2024	2023
	(in thousands)	
Receivables included in accounts receivable	$ —	$ —
Contract liabilities included in deferred revenue	$ —	$ 866

Glaxosmithkline Intellectual Property (No. 3) Limited ("GSK")

GSK-HSD License Agreement

On November 22, 2021, GSK and the Company entered into an Exclusive License Agreement (the "GSK-HSD License Agreement"). Under the GSK-HSD License Agreement, GSK has received an exclusive license for GSK-4532990 (formerly ARO-HSD). The exclusive license is worldwide with the exception of greater China. GSK is wholly responsible for all clinical development and commercialization of GSK-4532990 in its territory.

The Company determined the initial transaction price totaled $120.0 million, including the upfront payment, which was collected in January 2022. The Company has completed its performance obligation related to this agreement, and the upfront payment of $120.0 million was fully recognized in the year ended September 30, 2022. Further, GSK dosed the first patient in a Phase 2b trial in March 2023 and paid a $30.0 million milestone payment to the Company in the third quarter of fiscal 2023.

The Company is eligible for an additional payment of $100.0 million upon achieving the first patient dosed in a Phase 3 trial. Furthermore, should the Phase 3 trial read out positively, and the potential new medicine receives regulatory

approval in major markets, the deal provides for commercial milestone payments to the Company of up to $190.0 million at first commercial sale, and up to $590.0 million in sales-related milestone payments. The Company is further eligible to receive tiered royalties on net product sales in a range of mid-teens to twenty percent.

GSK-HBV Agreement

On December 11, 2023, the Company entered into an Amended and Restated License Agreement with GSK (the "GSK-HBV Agreement") pursuant to which GSK received a worldwide, exclusive license to develop and commercialize daplusiran/tomligisiran (GSK5637608, formerly JNJ-3989), the Company's third-generation subcutaneously administered RNAi therapeutic candidate being developed as a potential therapy for patients with chronic hepatitis B virus infection. GSK5637608 had previously been licensed to Janssen in October 2018.

Under the terms of the GSK-HBV Agreement, the Company received $2.7 million in December 2023, upon signing the amended GSK-HBV Agreement. The Company is eligible to receive up to $832.5 million in development and sales milestone payments under the GSK-HBV Agreement.

There were no contract assets and liabilities recorded as of September 30, 2024.

Horizon Therapeutics Ireland DAC ("Horizon")

In June 2021, Horizon and the Company entered into a collaboration and license agreement (the "Horizon License Agreement"). Under the terms of the Horizon License Agreement, Horizon received a worldwide exclusive license for HZN-457, a clinical-stage medicine being developed by Horizon as a potential treatment for people with uncontrolled gout.

At the inception of the Horizon License Agreement, the Company identified one distinct performance obligation. The Company determined that the key deliverables included the license and certain R&D services, including the Company's responsibilities to conduct all activities through the preclinical stages of development of HZN-457 (the "Horizon R&D Services"). The Company received a $40.0 million upfront payment in July 2021. Revenue was recognized on a straight-line basis, which corresponded to the timeframe for completing the Horizon R&D Services, concluding in the first quarter of 2023. Further, the Company received an additional $15.0 million upon Horizon's initiation of a Phase 1 clinical trial in January 2023.

On October 6, 2023, Amgen completed its acquisition of Horizon and subsequently notified the Company of Amgen's intent to terminate the HZN-457 license. Horizon exercised its right to terminate the Horizon License Agreement for convenience, which took effect on December 21, 2023.

Takeda Pharmaceutical Company Limited ("Takeda")

In October 2020, Takeda and the Company entered into an Exclusive License and Co-Funding Agreement (the "Takeda License Agreement"). Under the Takeda License Agreement, Takeda and the Company will co-develop the Company's fazirsiran program (formerly TAK-999 and ARO-AAT), the Company's second-generation subcutaneously administered RNAi therapeutic candidate being developed as a treatment for liver disease associated with alpha-1 antitrypsin deficiency. Within the United States, fazirsiran, if approved, will be co-commercialized under a 50/50 profit sharing structure. Outside the United States, Takeda received an exclusive license to commercialize fazirsiran and will lead the global commercialization strategy, while the Company will be eligible to receive tiered royalties of 20% to 25% on net sales.

At the inception of the Takeda License Agreement, the Company identified one distinct performance obligation. The Company determined that the key deliverables included the license and certain R&D services including the Company's responsibilities to complete the initial portion of the SEQUOIA study, to complete the ongoing Phase 2 AROAAT2002 study and to ensure certain manufacturing of fazirsiran drug product is completed and delivered to Takeda (the "Takeda R&D Services"). Due to the specialized and unique nature of these Takeda R&D Services and their direct relationship with the license, the Company determined that these deliverables represent one distinct bundle and, thus, one performance obligation. Beyond the Takeda R&D Services, which are the responsibility of the Company, Takeda will be responsible for managing future clinical development and commercialization outside the United States. Within the United States, the Company will also participate in co-development and co-commercialization efforts and will co-fund these efforts with Takeda as part of the 50/50 profit sharing structure within the United States. The Company considers the collaborative activities, including the co-development and co-commercialization, to be a separate unit of account within Topic 808, and as such, these co-funding amounts are recorded as research and development expenses or general and administrative expenses, as appropriate.

Under the terms of the Takeda License Agreement, the Company received $300.0 million as an upfront payment in January 2021 and an additional $40.0 million upon Takeda's initiation of a Phase 3 REDWOOD clinical study of fazirsiran

in March 2023, and is eligible to receive up to $527.5 million in additional potential development, regulatory and commercial milestones.

The Company allocated the total $300.0 million initial transaction price to its one distinct performance obligation for the fazirsiran license and the associated Takeda R&D Services. Revenue was recognized using the input method (based on actual patient visits completed versus total estimated visits completed for the ongoing SEQUOIA and AROAAT2002 clinical studies). The Phase 2 study visits for patients in the SEQUOIA and AROAAT2002 studies concluded by December 31, 2023, and the Company has substantially completed its performance obligation under the Takeda License Agreement. As such, all revenue has been fully recognized as of December 31, 2023. There were no further deferred revenue and contract liabilities as of September 30, 2024.

The Company recorded $23.4 million as accrued expenses as of September 30, 2024 that was primarily driven by co-development and co-commercialization activities.

Janssen Pharmaceuticals, Inc. ("Janssen")

On April 7, 2023, Janssen voluntarily terminated its collaboration agreement with the Company and the Company regained full rights to ARO-PNPLA3, formerly called JNJ-75220795. ARO-PNPLA3 is in Phase 1 clinical trials, which are now being developed by the Company.

Further, on December 11, 2023, the Company entered into the GSK-HBV Agreement, as discussed above, pursuant to which GSK received an exclusive license for daplusiran/tomligisiran (GSK5637608, formerly JNJ-3989). Daplusiran/tomligisiran had previously been licensed to Janssen in October 2018.

Amgen Inc. ("Amgen")

In September 2016, Amgen and the Company entered into two collaboration and license agreements and a common stock purchase agreement. Under the Second Collaboration and License Agreement (the "Olpasiran Agreement"), Amgen received a worldwide, exclusive license to the Company's novel RNAi olpasiran (previously referred to as AMG-890 or ARO-LPA) program. These RNAi molecules are designed to reduce elevated lipoprotein(a), which is a genetically validated, independent risk factor for atherosclerotic cardiovascular disease. Under the Olpasiran Agreement, Amgen is wholly responsible for clinical development and commercialization.

Under the Olpasiran Agreement, the Company has received $35.0 million in upfront payments and $21.5 million in the form of an equity investment by Amgen in the Company's common stock. Further, the Company received an additional $55.0 million in milestone payments; $10.0 million upon Amgen's initiation of a Phase 1 study in September 2018, $20.0 million upon its initiation of a Phase 2 clinical study in July 2020, and $25.0 million upon its first subject enrollment in a Phase 3 trial in December 2022. The Company has substantially completed its performance obligations under the Olpasiran Agreement. There were no contract assets and liabilities recorded as of September 30, 2024.

In November 2022, Royalty Pharma Investments 2019 ICAV ("Royalty Pharma") and the Company entered into a Royalty Purchase Agreement with Royalty Pharma (the "Royalty Pharma Agreement"). Pursuant to the Royalty Pharma Agreement, Royalty Pharma paid an upfront amount of $250.0 million during the first quarter of fiscal 2023. An additional milestone payment of $50.0 million was paid during the third quarter of fiscal 2024 due to the completed enrollment of the Phase 3 OCEAN(a) outcomes trial for olpasiran. In consideration for the payments under the Royalty Pharma Agreement, Royalty Pharma is entitled to receive all royalties otherwise payable by Amgen to the Company under the Olpasiran Agreement. The Company remains eligible to receive up to an additional $485.0 million in remaining development, regulatory and sales milestone payments payable from Amgen and Royalty Pharma. See Note 13.

NOTE 3. BALANCE SHEET ACCOUNTS

Property, Plant and Equipment

The following table summarizes the Company's major classes of property, plant and equipment:

	September 30,	
	2024	2023
	(in thousands)	
Land	$ 2,996	$ 2,996
Building	75,988	—
Research equipment	65,353	56,509
Furniture	5,594	1,540
Computers and software	981	700
Leasehold improvements	104,410	103,813
Construction in progress	188,731	166,655
	444,053	332,213
Less: Accumulated depreciation and amortization	(58,021)	(41,951)
Property, plant and equipment, net	$ 386,032	$ 290,262

Depreciation and amortization expense for property, plant and equipment for the years ended September 30, 2024, 2023, and 2022 was $16.9 million, $10.7 million and $8.7 million, respectively.

During the first quarter of fiscal 2024, the Company completed the build out of one of its laboratory and office facilities in Verona, Wisconsin, which resulted in the reclassification of $76.0 million from construction in progress to building as of September 30, 2024. Further, the Company commenced depreciation on the newly completed facility over a 39-year period.

Accrued Expenses

Accrued expenses consist of the following:

	September 30,	
	2024	2023
	(in thousands)	
Accrued R&D expenses	$ 28,069	$ 12,826
Accrued R&D expenses; co-development	23,351	5,895
Accrued capital expenditures	4,206	14,044
Other	7,391	6,998
Total accrued expenses	$ 63,017	$ 39,763

NOTE 4. INVESTMENTS

The Company's investments consisted of the following:

	As of September 30, 2024 (in thousands)			
	Adjusted Basis	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Available-for-sale securities	$ 577,465	$ 837	$ (26)	$ 578,276
Total current investments	$ 577,465	$ 837	$ (26)	$ 578,276

	As of September 30, 2023 (in thousands)			
	Adjusted Basis	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Available-for-sale securities	$ 295,699	$ 3	$ (2,967)	$ 292,735
Total current investments	$ 295,699	$ 3	$ (2,967)	$ 292,735

As of September 30, 2024, the gross unrealized losses were immaterial, and all of the Company's available-for-sale investments were due within one year or less. On September 30, 2023, the Company changed the classification of its investment securities from held-to-maturity to available-for-sale. At the date of the transfer, the carrying value of the Company's held-to-maturity securities was $295.7 million, and net unrealized losses of $3.0 million were recognized in accumulated other comprehensive loss.

The Company has determined that the available-for-sale securities that were in an unrealized loss position did not have any credit loss impairment as of September 30, 2024 and 2023.

NOTE 5. INTANGIBLE ASSETS

Intangible assets subject to amortization include patents and a license agreement capitalized as part of the Novartis RNAi asset acquisition in March 2015. The following table presents the components of intangible assets:

	Gross Carrying Amount	Accumulated Amortization	Impairment	Net Carrying Amount	Useful Lives
		(in thousands)			(in years)
As of September 30, 2024					
Patents	$ 21,728	$ 14,873	$ —	$ 6,855	14
License	3,129	1,422	—	1,707	21
Total intangible assets, net	$ 24,857	$ 16,295	$ —	$ 8,562	
As of September 30, 2023					
Patents	$ 21,728	$ 13,321	$ —	$ 8,407	14
License	3,129	1,274	—	1,855	21
Total intangible assets, net	$ 24,857	$ 14,595	$ —	$ 10,262	

Intangible assets are reviewed annually for impairment and more frequently if potential impairment indicators exist. No impairment indicators were identified during 2024 and 2023.

Intangible assets with definite useful lives are amortized on a straight-line basis over their useful lives. Intangible assets amortization expense in each of 2024, 2023, and 2022 was $1.7 million. None of the intangible assets with definite useful lives are anticipated to have a residual value.

The following table presents the estimated future amortization expense related to intangible assets as of September 30, 2024:

Year Ending September 30,	Amortization Expense (in thousands)
2025	$ 1,700
2026	1,700
2027	1,700
2028	1,700
2029	795
Thereafter	967
Total	$ 8,562

NOTE 6. STOCKHOLDERS' EQUITY

The following table summarizes the Company's shares of common stock and preferred stock:

	Par Value	Shares		
		Authorized	Issued	Outstanding
			(in thousands)	
As of September 30, 2024				
Common stock	$ 0.001	290,000	124,376	124,376
Preferred stock	$ 0.001	5,000	—	—
As of September 30, 2023				
Common stock	$ 0.001	290,000	107,312	107,312
Preferred stock	$ 0.001	5,000	—	—

As of September 30, 2024 and 2023, respectively, 11,492,293 and 12,709,837 shares of common stock were reserved for issuance upon exercise of options and vesting of restricted stock units granted or available for grant under the Company's 2013 and 2021 Incentive Plans, as well as for other inducement grants made to new employees under Rule 5635(c)(4) of the Nasdaq Listing Rules.

On January 2, 2024, the Company entered into an underwriting agreement with Jefferies LLC, BofA Securities, Inc., and Cowen and Company, LLC, as representatives of the several underwriters. The Company issued 15,790,000 shares of common stock at an offering price of $28.50 per share. The aggregate purchase price paid by investors was $450.0 million and the Company received net proceeds of $429.3 million after deducting advisory fees and offering expenses.

On December 2, 2022, the Company entered into an open market sale agreement (the "Open Market Sale Agreement"), pursuant to which the Company may, from time to time, sell up to $250,000,000 in shares of the Company's common stock through Jefferies LLC, acting as the sales agent and/or principal, in an at-the-market offering ("ATM Offering"). The Company is not required to sell shares under the Open Market Sale Agreement. The Company will pay Jefferies LLC a commission of up to 3.0% of the aggregate gross proceeds received from all sales of the common stock under the Open Market Sale Agreement. Unless otherwise terminated, the ATM Offering shall terminate upon the earlier of (i) the sale of all shares of common stock subject to the Open Market Sale Agreement and (ii) the termination of the Open Market Sale Agreement as permitted therein. The Company and Jefferies may each terminate the Open Market Sale Agreement at any time upon prior notice. As of September 30, 2024, no shares have been issued under the Open Market Sale Agreement.

NOTE 7. COMMITMENTS AND CONTINGENCIES

Litigation

From time to time, the Company may be subject to various claims and legal proceedings in the ordinary course of business. If the potential loss from any claim, asserted or unasserted, or legal proceeding is considered probable and the amount is reasonably estimable, the Company will accrue a liability for the estimated loss. There were no contingent liabilities recorded as of September 30, 2024 and 2023.

Commitments

The Company owns land in the Verona Technology Park in Verona, Wisconsin, which has been developed into an approximately 160,000 square foot drug manufacturing facility and an approximately 140,000 square foot laboratory and office facility which will support the Company's manufacturing process development and analytical activities. During the first quarter of fiscal 2024, the Company completed the build out of one of its laboratory and office facilities.

As of September 30, 2024, the Company has incurred $285.7 million and intends to spend an additional $8.0 million to complete the build out of the facilities.

NOTE 8. LEASES

Pasadena, California: The Company leases 49,000 square feet of office space located at 177 East Colorado Blvd. for its corporate headquarters from 177 Colorado Owner, LLC, which lease expires on April 30, 2027. The lease contains an option to renew for one additional five-year term. The Company is not reasonably certain that it will exercise this option to renew and therefore it is not included in right-of-use assets and liabilities as of September 30, 2024.

San Diego, California: The Company leases 144,000 square feet of office and research and development laboratory space located at 10102 Hoyt Park from 11404 & 11408 Sorrento Valley Owner, LLC, which lease expires on April 30, 2038. Pursuant to the lease, within twelve months of the expiration of the initial 15-year term, the Company has the option to

extend the lease for up to one additional ten-year term, with certain annual increases in base rent. The Company is not reasonably certain that it will exercise this option to renew and therefore it is not included in right-of-use assets and liabilities as of September 30, 2024.

The lease agreement grants the Company the right to receive an Additional Tenant Improvement Allowance ("ATIA") funded by the lessor, with a maximum amount of $7.2 million, subject to a 7% interest per annum over the base term. Further, on September 25, 2023, the Company executed the first amendment to the lease, which grants a second ATIA with a maximum amount of $23.6 million, bearing interest at a rate of 9% per annum over the base term. The Company received $3.1 million and $27.7 million in ATIA from the lessor during fiscal years 2024 and 2023, respectively. As a result, the Company remeasured its lease liability and right-of-use assets to reflect these additional allowances and the related increased lease payments. The Company has further concluded that these ATIAs have no effects on the classification of the lease.

The Company previously subleased additional research and development space in San Diego, California, which sublease ended during the fiscal year of 2023.

Madison, Wisconsin: The Company leases 107,000 square feet space located at 502 South Rosa Road for its office and laboratory facilities from University Research Park, Inc., which lease expires on September 30, 2031. The lease contains options to renew for two terms of five years. The Company is not reasonably certain that it will exercise this option and therefore it is not included in right-of-use assets and liabilities as of September 30, 2024.

The components of lease assets and liabilities along with their classification on the Company's consolidated balance sheets were as follows:

Lease Assets and Liabilities	Classification	September 30, 2024	September 30, 2023
		(in thousands)	
Operating lease assets	Right-of-use assets	$ 45,255	$ 45,297
Current operating lease liabilities	Lease liabilities	6,342	10,563
Non-current operating lease liabilities	Lease liabilities, net of current portion	111,027	104,608

Lease Cost	Classification	Year Ended September 30, 2024	2023	2022
			(in thousands)	
Operating lease cost	Research and development	$ 11,035	$ 10,350	$ 7,278
	General and administrative expense	2,006	1,730	1,757
Variable lease cost[(1)]	Research and development	3,648	1,179	728
	General and administrative expense	—	—	—
Total		$ 16,689	$ 13,259	$ 9,763

(1) Variable lease cost is primarily related to operating expenses associated with the Company's operating leases.

There was $0, $1.4 million and $0.3 million short-term lease cost during the years ended September 30, 2024, 2023, and 2022, respectively.

The following table presents maturities of operating lease liabilities on an undiscounted basis as of September 30, 2024:

Year	Amounts (in thousands)
2025	$ 15,456
2026	15,799
2027	14,974
2028	13,619
2029	13,905
2030 and thereafter	114,790
Total	$ 188,543
Less imputed interest	(71,174)
Total operating lease liabilities	$ 117,369

Supplemental cash flow and other information related to leases was as follows:

	Year Ended September 30,		
	2024	2023	2022
	(in thousands)		
Cash received for amounts included in the measurement of lease liabilities:			
Operating cash flows from operating leases	$ 3,099	$ 48,391	$ —
Right-of-use assets adjusted in exchange for new/amended operating lease liabilities	$ (29)	$ 17,071	$ —
Cash paid for amounts included in the measurement of lease liabilities:			
Operating cash flows from operating leases	$ 11,038	$ 5,204	$ 4,500
Weighted-average remaining lease term (in years)	12.5	13.5	7
Weighted-average discount rate	8.0 %	8.0 %	8.5 %

NOTE 9. STOCK-BASED COMPENSATION

The Company has three plans that provide for equity-based compensation.

Under the 2013 Incentive Plan (the "2013 Plan"), 2,899,230 shares of the Company's common stock are reserved for grants of stock options and restricted stock awards to employees and directors as of September 30, 2024.

Under the 2021 Incentive Plan (the "2021 Plan"), 8,000,000 shares (subject to certain adjustments) of the Company's common stock are reserved for grants of stock options, stock appreciation rights, restricted and unrestricted stock, performance awards, cash awards and other awards convertible into or otherwise based on shares of the Company's common stock. The maximum number of shares authorized under the 2021 Plan will be (i) reduced by any shares subject to awards made under the 2013 Plan after January 1, 2021, and (ii) increased by any shares subject to outstanding awards under the 2013 Plan as of January 1, 2021 that, after January 1, 2021, are canceled, expired, forfeited or otherwise not issued under such awards (other than as a result of being tendered or withheld to pay the exercise price or withholding taxes in connection with any such awards) or settled in cash. As of September 30, 2024, the total number of shares available for issuance was 4,600,465 shares, which includes 159,678 and 190,627 shares that were forfeited under the 2013 and 2021 Plans, respectively, and 3,749,840 shares have been granted under the 2021 Plan.

Under the Inducement Plan (the "Inducement Plan"), 832,950 shares of the Company's common stock are authorized for issuance pursuant to grants of stock options, stock appreciation rights, restricted and unrestricted stock, stock units (including restricted stock units), performance awards, cash awards, and other awards convertible into or otherwise based on shares of the Company's common stock. Awards under the Inducement Plan may only be granted to new employees of the Company in accordance with the provisions of Rule 5635(c)(4) of the Nasdaq Listing Rules. As of September 30, 2024, the total number of shares remaining available for issuance was 510,600 shares, and 362,050 shares have been granted under the Inducement Plan.

In addition, prior to adoption of the Inducement Plan, the Company previously granted stand-alone inducement awards in the form of stock options and restricted stock units outside of the Company's equity plans to new employees under Rule 5635(c)(4) of the Nasdaq Listing Rules. As of September 30, 2024, there were 655,645 and 244,625 shares underlying outstanding stand-alone inducement options and restricted stock units, respectively.

The following table presents a summary of awards outstanding:

	As of September 30, 2024			
	2013 Plan	2021 Plan	Inducement Awards	Total
Granted and outstanding awards:				
Options	1,290,720	32,151	655,645	1,978,516
Restricted stock units	1,608,510	2,768,776	536,026	4,913,312
Total	2,899,230	2,800,927	1,191,671	6,891,828

The following table summarizes stock-based compensation expenses included in operating expenses:

	Year Ended September 30,		
	2024	2023	2022
	(in thousands)		
Research and development	$ 29,527	$ 34,332	$ 32,371
General and administrative	37,570	43,798	88,522
Total	$ 67,097	$ 78,130	$ 120,893

Stock Option Awards

The following table presents a summary of the stock option activity for the year ended September 30, 2024:

	Shares	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Outstanding at September 30, 2023	2,263,477	$ 22.68		
Granted	—	—		
Cancelled or expired	(58,957)	36.80		
Exercised	(226,004)	10.64		
Outstanding at September 30, 2024	1,978,516	$ 23.39	3.5	$ 13,782,840
Exercisable at September 30, 2024	1,975,824	$ 23.33	3.5	$ 13,782,840

The aggregate intrinsic values represent the amount by which the market price of the underlying stock exceeds the exercise price of the option. The total intrinsic value of the options exercised during the years ended September 30, 2024, 2023, and 2022 was $4.2 million, $12.2 million and $27.6 million, respectively.

Stock-based compensation expense related to stock options outstanding for the years ended September 30, 2024, 2023, and 2022 was $2.8 million, $8.4 million and $10.8 million, respectively.

As of September 30, 2024, the pre-tax compensation expense for all outstanding unvested stock options in the amount of $0.1 million will be recognized in the Company's results of operations over a weighted average period of 2 months.

The fair value of each stock option award is estimated on the date of grant using the Black-Scholes option pricing model. The Black-Scholes pricing valuation model was developed for use in estimating the fair value of traded options, which do not have vesting restrictions and are fully transferable. The determination of the fair value of each stock option is affected by the Company's stock price on the date of grant, as well as assumptions regarding a number of highly complex and subjective variables. Because the Company's employee stock options have characteristics significantly different from those of traded options, and because changes in the subjective input assumptions can materially affect the fair value estimate, the existing models do not necessarily provide a reliable single measure of the fair value of its employee stock options.

The following table provides the assumptions used in the calculation of grant-date fair values of these stock options based on the Black-Scholes option pricing model:

	Year Ended September 30,		
	2024[5]	2023	2022[5]
Expected dividend yield[1]	—	—	—
Risk-free interest rate[2]	N/A	3.69 – 4.57%	N/A
Expected volatility[3]	N/A	86.4 %	N/A
Expected term (in years)[4]	N/A	6.25	N/A
Weighted-average grant date fair value per share	N/A	25.61	N/A

(1) The dividend yield is zero as the Company currently does not pay a dividend.
(2) The risk-free interest rate is based on that of the U.S. Treasury yields with equivalent terms in effect at the time of the grant.
(3) Volatility is estimated based on volatility average of the Company's common stock price.

(4) The computation of expected term was determined based on safe harbor rules, considering the contractual terms of the awards and vesting schedules.
(5) No options were granted during the year ended September 30, 2024 and September 30, 2022.

Visirna ESOP: On October 1, 2023, Visirna, a subsidiary of the Company, granted 7,500,000 stock options to its employees from the Employee Stock Option Plan (the "Visirna ESOP"), which authorizes 20,000,000 shares for issuance. The Visirna ESOP is independently managed by Visirna, including the valuation process. As of September 30, 2024, stock-based compensation expense related to the Visirna ESOP was $6.9 million.

Restricted Stock Units

Restricted stock units ("RSUs"), including market-based, time-based and performance-based awards, have been granted under the Company's 2013 and 2021 Plans, the Inducement Plan and as inducements awards granted outside of the Company's equity-based compensation plans. At vesting, each outstanding RSU will be exchanged for one share of the Company's common stock. RSU awards generally vest subject to the satisfaction of service requirements or the satisfaction of both service requirements and achievement of certain performance targets.

The following table summarizes the activity of the Company's RSUs:

	Number of RSUs	Weighted-Average Grant Date Fair Value
Outstanding as of September 30, 2023	4,241,640	$ 58.43
Granted	1,939,025	30.53
Vested	(1,047,565)	51.90
Forfeited	(219,788)	40.43
Outstanding as of September 30, 2024	4,913,312	$ 49.61

The fair value of RSUs was determined based on the closing price of the Company's common stock on the grant date, with consideration given to the probability of achieving service and/or performance conditions for awards.

For the years ended September 30, 2024, 2023 and 2022, the Company recorded stock-based compensation expense of $64.3 million, $69.7 million and $113.6 million, respectively, related to shares of RSUs. As of September 30, 2024, there was $80.8 million of total unrecognized compensation cost related to RSUs that is expected to be recognized over a weighted-average period of 1.6 years.

NOTE 10. FAIR VALUE MEASUREMENTS

The Company employs a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The fair value of a financial instrument is the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date using the exit price. Accordingly, when market observable data are not readily available, the Company's own assumptions are used to reflect those that market participants would be presumed to use in pricing the asset or liability at the measurement date.

Assets and liabilities recorded at fair value on the consolidated balance sheets are categorized based on the level of judgment associated with inputs used to measure their fair values and the level of market price observability, as follows:

Level 1 Unadjusted quoted prices are available in active markets for identical assets or liabilities as of the reporting date.

Level 2 Pricing inputs are other than quoted prices in active markets, which are based on the following:

- Quoted prices for similar assets or liabilities in active markets;
- Quoted prices for identical or similar assets or liabilities in non-active markets; or
- Either directly or indirectly observable inputs as of the reporting date.

Level 3 Pricing inputs are unobservable and significant to the overall fair value measurement, and the determination of fair value requires significant management judgment or estimation.

In certain cases, inputs used to measure fair value may fall into different levels of the fair value hierarchy. In such cases, the level in the fair value hierarchy within which the fair value measurement in its entirety falls has been determined based on the lowest level input that is significant to the fair value measurement in its entirety. Thus, a Level 3 fair value measurement may include inputs that are observable (Level 1 or Level 2) and unobservable (Level 3). The Company's assessment of the significance of a particular input to the fair value measurement in its entirety requires judgment and consideration of factors specific to the asset or liability.

The Company uses prices and inputs that are current as of the measurement date, including during periods of market disruption. In periods of market disruption, the ability to observe prices and inputs may be reduced for many instruments. This condition could cause an instrument to be reclassified from Level 1 to Level 2, or from Level 2 to Level 3. The Company recognizes transfers between levels at either the actual date of the event or a change in circumstances that caused the transfer. At September 30, 2024 and 2023, the Company did not have any financial assets or financial liabilities based on Level 3 measurements.

The following table presents information about the Company's assets and liabilities measured at fair value on a recurring basis, and indicate the fair value hierarchy of the valuation techniques utilized by the Company:

	September 30, 2024			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
Available-for-sale securities				
U.S. government and agency securities	$ —	$ 160,723	$ —	$ 160,723
Commercial notes	—	179,714	—	179,714
Corporate debt securities	—	237,839	—	237,839
Total available-for-sale securities	—	578,276	—	578,276
Cash equivalents				
Money market instruments	66,966	—	—	66,966
Total cash equivalents	66,966	—	—	66,966
Total financial assets	$ 66,966	$ 578,276	$ —	$ 645,242

	September 30, 2023			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
Available-for-sale securities				
U.S. government bonds	$ 31,553	$ —	$ —	$ 31,553
Municipal securities	—	7,093	—	7,093
Commercial notes	—	22,205	—	22,205
Corporate debt securities	—	231,884	—	231,884
Total available-for-sale securities	31,553	261,182	—	292,735
Cash equivalents				
Money market instruments	39,733	—	—	39,733
Total cash equivalents	39,733	—	—	39,733
Total financial assets	$ 71,286	$ 261,182	$ —	$ 332,468

NOTE 11. INCOME TAXES

Income Tax Provision

The components of the loss before income tax expense and noncontrolling interest are as follows:

	Year Ended September 30,		
	2024	2023	2022
	(in thousands)		
Domestic	$ (582,333)	$ (194,639)	$ (170,570)
Foreign	(30,127)	(7,852)	(1,708)
Total	$ (612,460)	$ (202,491)	$ (172,278)

The provision for income taxes consisted of the following components:

	Year Ended September 30,		
	2024	2023	2022
	(in thousands)		
Current:			
Federal	$ 148	$ 1,074	$ —
State	375	1,710	304
Foreign	(3,290)	—	3,481
Total current tax	$ (2,767)	$ 2,784	$ 3,785
Deferred:			
Federal	$ —	$ —	$ —
State	—	—	—
Foreign	—	—	—
Total deferred tax	$ —	$ —	$ —
Income tax provision	$ (2,767)	$ 2,784	$ 3,785

The following table presents a reconciliation of the tax expense based on the statutory rate to the Company's actual tax expense in the consolidated statements of operations and comprehensive loss. A notional 21% tax rate was applied as follows:

	September 30,		
	2024	2023	2022
U.S. federal statutory income tax	21.0 %	21.0 %	21.0 %
State income taxes, net of federal tax benefit	2.6 %	0.4 %	8.6 %
Tax credits	3.0 %	6.8 %	— %
Permanent and other items	2.5 %	(4.6)%	(1.7)%
Non-deductible compensation	(0.9)%	(4.6)%	— %
Foreign-derived intangible income deduction	— %	1.2 %	— %
Stock compensation	(0.7)%	(1.1)%	(1.7)%
Valuation allowance	(27.0)%	(20.5)%	(28.4)%
Effective income tax rate	0.5 %	(1.4)%	(2.2)%

Deferred Income Taxes

The following table presents the significant components of the Company's net deferred tax assets and liabilities:

	September 30,	
	2024	2023
	(in thousands)	
Deferred tax assets:		
Net operating loss carryforwards	$ 102,716	$ 60,495
Capitalized research and development	156,015	75,208
Tax credits	85,428	66,407
Deferred revenue	81,556	59,441
Lease liabilities	27,999	25,382
Stock compensation	10,989	10,296
Accrued compensation	4,078	3,082
Intangible assets	1,384	1,523
Other	2,843	2,636
Total gross deferred tax assets	$ 473,008	$ 304,470
Valuation allowance	$ (448,867)	$ (284,626)
Deferred tax liabilities:		
Fixed assets	$ (13,155)	$ (9,878)
Right-of-use assets	(10,792)	(9,966)
Unrealized gains	(194)	—
Total gross deferred tax liability	$ (24,141)	$ (19,844)
Net deferred tax assets (liabilities)	$ —	$ —

A valuation allowance is recorded to reduce deferred tax assets to the amount that is more likely than not to be realized based on an assessment of positive and negative evidence, including estimates of future taxable income necessary to realize future deductible amounts. A significant piece of objective negative evidence evaluated was the cumulative loss incurred over the three-year period ended September 30, 2024. Such objective evidence limits the ability to consider other subjective evidence such as its projections for future growth. On the basis of this evaluation at September 30, 2024 and 2023, a valuation allowance of $448.9 million and $284.6 million, respectively, has been recorded.

As of September 30, 2024, the Company had accumulated federal, state, and foreign net operating loss ("NOL") carry forwards of $223.1 million, $693.2 million and $38.3 million, respectively. Of the $223.1 million in federal NOL carryforwards, $23.3 million was generated before January 1, 2018, and is subject to a 20-year carryforward period ("pre-Tax Act losses"), with expiration beginning in 2031. The remaining $199.8 million ("post-Tax Act losses") can be carried forward indefinitely but is subject to an 80% taxable income limitation. Of the $693.2 million in state NOL carryforwards, $5.4 million can be carried forward indefinitely, while the remaining balance begins to expire in 2031. The Company also has foreign NOL carryforwards totaling $38.3 million, which begin to expire in 2027. Additionally, the Company has federal and state income tax credits of $85.6 million and $20.1 million, respectively. The federal credits begin to expire in 2035. Of the state income tax credits, $11.2 million begins to expire in 2035, while the remaining credits can be carried forward indefinitely.

Pursuant to Sections 382 and 383 of the Internal Revenue Code of 1986, as amended (the "Code"), the annual use of an entity's NOL and research and development credit carryforwards may be limited if there is a cumulative ownership change of greater than 50% within a three-year period. The annual limitation is determined based on the entity's value immediately prior to the ownership change. Future ownership changes could further affect the limitation. If a limitation is applied, the related tax asset would be removed from the deferred tax asset schedule, with a corresponding reduction in the valuation allowance. To date, the Company has completed an analysis pursuant to Sections 382 and 383 through September 30, 2023. Ownership Changes may have occurred since then, and future changes could potentially limit the Company's ability to utilize these attributes.

Uncertainty in Income Taxes

The Company has adopted guidance issued by the FASB that clarifies the accounting for uncertainty in income taxes recognized in an enterprise's financial statements and prescribes a recognition threshold of more-likely-than not and a measurement process for financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return. In making this assessment, a company must determine whether it is more-likely-than not that a tax position

will be sustained upon examination, based solely on the technical merits of the position and must assume that the tax position will be examined by taxing authorities.

The following table summarizes the Company's gross unrecognized tax benefits:

	Year Ended September 30,		
	2024	2023	2022
	(in thousands)		
Beginning balance of unrecognized tax benefits	$ 14,536	$ 3,481	$ —
Gross increase for prior period tax positions	654	9,495	3,481
Gross decrease for prior period tax positions	—	(1,489)	—
Gross increase for current period tax positions	3,415	3,049	—
Lapse of statue of limitations	(1,992)	—	—
Ending balance of unrecognized tax benefits	$ 16,613	$ 14,536	$ 3,481

The Company has recorded income tax benefit of $3.3 million for the year ended September 30, 2024, and income tax expense of $0 and $3.5 million for the years ended September 30, 2023 and 2022, respectively, related to uncertain tax positions inclusive of interest and penalties. The Company's policy is to recognize potential interest and penalties related to unrecognized tax benefits associated with uncertain tax positions, if any, in the income tax provision. As of September 30, 2024, the Company has not accrued any interest or penalties.

If the unrecognized tax benefit as of September 30, 2024 is ultimately recognized, there would be no reduction in the Company's income tax expense or effective tax rate, excluding the impact of U.S. Tax benefits netted against deferred taxes that are subject to a valuation allowance. The Company does not anticipate any changes in its unrecognized tax benefits over the next 12 months.

The Company is subject to taxation in the U.S. and various states along with other foreign countries. Due to the presence of NOL carryforwards, all of the income tax years remain open for examination domestically. The Company has not been notified that it is under audit by the Internal Revenue Service or foreign taxing authorities; however, the Company has been notified of an income tax examination by the state of California. There are no other audits in any other jurisdictions.

Deferred income taxes have not been provided for undistributed earnings of the Company's consolidated foreign subsidiaries because of the Company's intent to reinvest such earnings indefinitely in active foreign operations. At September 30, 2024, the Company had $0 in unremitted earnings that were permanently reinvested related to its consolidated foreign subsidiaries.

The tax Cuts and Jobs Act subjects a U.S. shareholder to tax on Global Intangible Low-Taxed Income ("GILTI") earned by certain foreign subsidiaries. The FASB Staff Q&A, Topic 740 No. 5. Accounting for GILTI, states that an entity can make an accounting policy election to either recognize deferred taxes for temporary basis differences expected to reverse as GILTI in future years or to provide for the tax expense related to GILTI in the year that the tax is incurred as a period expense only. The Company has elected to account for GILTI in the year the tax is incurred.

NOTE 12. EMPLOYEE BENEFIT PLANS

The Company sponsors a defined contribution retirement plan which is under Section 401(k) of the Internal Revenue Code and is designed to adhere to ERISA Fiduciary standards. All of the Company's full-time employees are eligible to participate this plan. Under the terms of the plan, an eligible employee may elect to contribute a portion of their salary on a pre-tax basis, subject to federal statutory limitations. The plan allows for a discretionary match in an amount up to 100% of each participant's first 3% of compensation contributed plus 50% of each participant's next 2% of compensation contributed.

For the years ended September 30, 2024, 2023, and 2022, the Company recorded expenses for the matching contributions under this plan of $3.4 million, $2.2 million and $1.7 million, respectively.

The Company also provides certain employee benefit plans, including those which provide health and life insurance benefits to employees.

NOTE 13. LIABILITY RELATED TO THE SALE OF FUTURE ROYALTIES

In November 2022, the Company and Royalty Pharma entered into the Royalty Pharma Agreement, pursuant to which Royalty Pharma agreed to pay up to $410.0 million in cash to the Company in consideration for the Company's future royalty interest in olpasiran, a siRNA originally developed by the Company and licensed to Amgen in September 2016 under the Olpasiran Agreement.

Pursuant to the Royalty Pharma Agreement, Royalty Pharma paid $250.0 million upfront and agreed to pay up to an additional $160.0 million in aggregate one-time milestone payments due if and when the following milestone events occur: (i) $50.0 million on completion of enrollment in the OCEAN Phase 3 clinical trial for olpasiran, (ii) $50.0 million upon receipt of FDA approval of olpasiran for an approved indication (reduction in the risk of myocardial infarction, urgent coronary revascularization, or coronary heart disease death in adults with established cardiovascular disease and elevated Lp(a)), and (iii) $60.0 million upon Royalty Pharma's receipt of at least $70.0 million of royalty payments under the Royalty Pharma Agreement in any single calendar year. During the third quarter of fiscal 2024, Amgen completed enrollment of the Phase 3 OCEAN(a) outcomes trial of olpasiran, which triggered a $50.0 million milestone payment that the Company received in the same quarter.

In consideration for the payment of the foregoing amounts under the Royalty Pharma Agreement, Royalty Pharma is entitled to receive all royalties otherwise payable by Amgen to the Company under the Olpasiran Agreement. The Company remains eligible to receive any milestone payments potentially payable by Amgen under the Olpasiran Agreement.

The Company has evaluated the terms of the Royalty Pharma Agreement and concluded in accordance with the relevant accounting guidance that the Company accounted for the transaction as debt and the funding of $250.0 million and $50.0 million from Royalty Pharma were recorded as liabilities related to the sale of future royalties on its consolidated balance sheets. The Company is not obligated to repay these funds received under the Royalty Pharma Agreement.

The Company records the obligations at their carrying value using the effective interest method. In order to amortize the sale of future royalties, the Company utilizes the prospective method to estimate the future royalties to be paid by the Company to the counterparty over the life of the arrangement. Under the prospective method, a new effective interest rate is determined based on the revised estimate of remaining cash flows. The new rate is the discount rate that equates the present value of the revised estimate of remaining cash flows with the carrying amount of the debt, and it will be used to recognize non-cash interest expense for the remaining periods. The Company periodically assesses the amount and the timing of expected royalty payments using a combination of internal projections and forecasts from external sources. The estimates of future net product sales (and resulting royalty payments) are based on key assumptions including population, penetration, probability of success and sales price, among others. To the extent such payments are greater or less than the Company's initial estimates or the timing of such payments is different than its original estimates, the Company will prospectively adjust the amortization of the royalty financing obligations and the effective interest rate. As of September 30, 2024, the estimated effective interest rate was 6.3%.

The following table presents the activity with respect to the liability related to the sale of future royalties.

	September 30,	
	2024	2023
	(in thousands)	
Beginning carrying value	$ 268,326	$ —
Upfront payment received	—	250,000
Milestone payment received	50,000	—
Non-cash interest expense recognized	23,035	18,326
Ending carrying value	$ 341,361	$ 268,326

NOTE 14. FINANCING AGREEMENT

On August 7, 2024 (the "Closing Date"), the Company entered into the Financing Agreement with the guarantors party thereto, the lenders party thereto (the "Lenders"), and Sixth Street Lending Partners ("Sixth Street"), as the administrative agent and collateral agent for the Lenders. The Financing Agreement establishes a senior secured term loan facility of $500.0 million (the "Credit Facility"), consisting of $400.0 million funded on the Closing Date and an additional $100.0 million available at the Company's option, subject to mutual agreement with Sixth Street, over the seven-year term. The outstanding principal balance of this Credit Facility, along with the accrued but unpaid interest, is due and payable on August 7, 2031 and bears interest at an annual rate of 15.0%. On the Closing Date, the Company received net proceeds of

$390.7 million, after issuance costs. Additional fees related to third parties have been paid or accrued as of September 30, 2024.

The Company is permitted to use the net proceeds for working capital, capital expenditures and general corporate purposes of the Company and its subsidiaries.

The Company will have the right to prepay loans under the Credit Facility at any time. The Company is required to partially repay loans under the Credit Facility with proceeds from certain asset sales, condemnation events and extraordinary receipts, subject, in some cases, to reinvestment rights. If the Company repays in full the aggregate principal outstanding under the Credit Facility and such payment in full occurs on or prior to August 7, 2028, the Company will be required to make an additional payment to the lenders under the Credit Facility on such date in an amount necessary for the lenders to achieve a multiple of two times on invested capital of the aggregate principal amount funded on the Closing Date. If such payment in full occurs after August 7, 2028, the Company will be required to make an additional payment to the lenders under the Credit Facility on such date in an amount necessary for the lenders to achieve the greater of the multiple of two times on invested capital of the aggregate principal amount funded on the Closing Date and the present value of all interest payments that would have been payable from such date through the maturity date of the Credit Facility.

All obligations under the Financing Agreement will be secured on a first-priority basis, subject to certain exceptions, by security interests in substantially all assets of the Company and material subsidiaries of the Company, including its intellectual property, and will be guaranteed by material subsidiaries of the Company, including foreign subsidiaries, subject to certain exceptions.

The Financing Agreement contains customary covenants, including, without limitation, a financial covenant to maintain liquidity (cash, cash equivalents and investments) of at least $100.0 million if the Company's market capitalization is above $1.5 billion, and negative covenants that, subject to certain exceptions, restrict indebtedness, liens, investments (including acquisitions), fundamental changes, asset sales and licensing transactions, dividends, modifications to material agreements, payment of subordinated indebtedness, and other matters customarily restricted in such agreements. The Company is subject to restrictions on sales and licensing transactions with respect to certain core intellectual property, subject to certain exceptions, including certain transactions related to areas outside the United States, United Kingdom, European Union, Japan and China.

The Financing Agreement contains certain embedded features that were identified and evaluated as not material to the consolidated financial statements.

The outstanding balance of the Credit Facility consisted of the following:

	September 30,	
	2024	2023
	(in thousands)	
Initial Term Loan	$ 400,000	$ —
Interest on the Initial Term Loan	9,000	—
Less: Unamortized debt discount and issuance costs	(15,817)	—
Net carrying amount	$ 393,183	$ —

The following table sets forth total interest expense recognized related to the Credit Facility:

	Year Ended September 30,		
	2024	2023	2022
	(in thousands)		
Amortization of debt discount and issuance costs	$ 317	$ —	$ —
Contractual interest expense	9,000	—	—
Total interest expense	$ 9,317	$ —	$ —

The amounts shown in the table below, related to the Credit Facility, represent the maximum payments the Company is obligated to make to the Lenders during the indicated periods. A principal repayment of $400.0 million is scheduled for the fifth year, in line with the contractual terms of the Credit Facility. Actual payments may vary and could be lower than the amounts presented in the table.

Year	Amounts (in thousands)
2025	$ —
2026	—
2027	—
2028	—
2029	400,000
Thereafter	9,000
Total	$ 409,000

NOTE 15. NET LOSS PER SHARE

The following table presents the computation of basic and diluted net loss per share for the years ended September 30, 2024, 2023 and 2022.

	Year Ended September 30,		
	2024	2023	2022
	(in thousands, except per share amounts)		
Numerator:			
Net loss attributable to Arrowhead Pharmaceuticals, Inc.	$ (599,493)	$ (205,275)	$ (176,063)
Denominator:			
Weighted-average basic shares outstanding	119,784	106,750	105,426
Effect of dilutive securities	—	—	—
Weighted-average diluted shares outstanding	119,784	106,750	105,426
Basic net loss per share	$ (5.00)	$ (1.92)	$ (1.67)
Diluted net loss per share	$ (5.00)	$ (1.92)	$ (1.67)

The following table sets forth the potentially dilutive securities that have been excluded from the calculation of diluted net loss per share because to include them would be anti-dilutive.

	Year Ended September 30,		
	2024	2023	2022
	(in thousands)		
Options	707	633	533
Restricted stock units	4,030	3,420	3,352
Total	4,737	4,053	3,885

NOTE 16. SUBSEQUENT EVENTS

On November 25, 2024, the Company entered into an Exclusive License and Collaboration Agreement (the "Collaboration Agreement") with Sarepta Therapeutics, Inc. ("Sarepta") for the co-development and commercialization of multiple clinical and preclinical programs in rare, genetic diseases of the muscle, central nervous system, and the lungs.

Under the Collaboration Agreement, Sarepta has received an exclusive worldwide license to the Company's ARO-DUX4, ARO-DM1, ARO-MMP7, and ARO-ATXN2 clinical stage programs. Sarepta has also received an exclusive sublicensable worldwide license to the Company's ARO-HTT, ARO-ATXN1, and ARO-ATXN3 preclinical stage programs.

Pursuant to the Collaboration Agreement, Sarepta will be able to select up to six new targets for which the Company will perform discovery, optimization and preclinical development. Upon completion of the Company's preclinical

activities, Sarepta will receive an exclusive license to the Company's product-specific intellectual property rights covering those compounds and be wholly responsible for clinical development and commercialization of each compound.

Closing of the Collaboration Agreement is subject to clearance under the Hart-Scott Rodino Antitrust Improvements Act.

In connection with the Collaboration Agreement, on November 25, 2024, the Company entered into a Stock Purchase Agreement (the "Stock Purchase Agreement") with an affiliate of Sarepta for a private placement of shares of common stock of the Company (the "Private Placement"). Pursuant to the Stock Purchase Agreement, the Company sold 11,926,301 shares of common stock, at a price per share of $27.25, for an aggregate value of approximately $325.0 million. The Private Placement is expected to close concurrently with the Collaboration Agreement.

Under the terms of the agreements taken together, the Company expects to receive $500.0 million as an upfront payment under the Collaboration Agreement, $325.0 million in the form of an equity investment under the Stock Purchase Agreement, and $250.0 million to be paid in annual installments of $50.0 million over 5 years. The Company is also eligible to receive $300.0 million in near-term payments associated with the continued enrollment of certain cohorts of a Phase 1/2 study, which the Company is on track to achieve. Further, for each of the 13 programs, the Company is eligible to receive development milestone payments between $110.0 million and $180.0 million per program and sales milestone payments between $500.0 million and $700.0 million per program. The Company is also eligible to receive tiered royalties on net sales of licensed products of up to the low double digits.

On November 26, 2024, the Company also entered into an amendment to the Credit Facility to modify, subject to certain conditions, amongst other things, the requirements to make prepayments of the loans under the Credit Facility with respect to the transactions contemplated by the Collaboration Agreement and the Stock Purchase Agreement.

On November 25, 2024, the Company entered into a Securities Purchase Agreement (the "Securities Purchase Agreement") with an institutional and accredited investor for a private placement of pre-funded warrants to purchase shares of common stock with an exercise price of $0.001 per share. Pursuant to the Securities Purchase Agreement, the Company sold pre-funded warrants to purchase up to 917,441 shares of common stock at a purchase price of $27.25 per pre-funded warrant, for an aggregate value of approximately $25.0 million. The transaction is expected to close on or about November 27, 2024.

INVESTOR RIGHTS AGREEMENT

This Investor Rights Agreement (this "Agreement") is made and entered into as of [●], 2024, by and between Arrowhead Pharmaceuticals, Inc., a Delaware corporation (the "Company"), and Sarepta Therapeutics Investments, Inc., a Delaware corporation (the "Purchaser").

NOW, THEREFORE, IN CONSIDERATION of the mutual covenants contained in this Agreement, and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the Company and the Purchaser agree as follows:

DEFINITIONS

Definitions. As used in this Agreement, the following terms shall have the following meanings:

(a) "Additional Registration Statement" has the meaning set forth in Section 3.1.1(c).

(b) "Adverse Disclosure" means public disclosure of material non-public information that, in the good faith judgment of the board of directors of the Company: (i) would be required to be made in such Registration Statement filed with the SEC by the Company so that such Registration Statement, from and after its effective date, does not contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading; (ii) would not be required to be made at such time but for the filing, effectiveness or continued use of such Registration Statement; and (iii) the Company has a bona fide business purpose for not disclosing publicly.

(c) "Affiliate" means, with respect to any Person, another Person that controls, is controlled by or is under common control with such Person; provided, that with respect to the Purchaser, the term "Affiliate" shall not include any employee benefit plan of Purchaser. A Person shall be deemed to control another Person if such Person possesses, directly or indirectly, the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of voting securities, by contract or otherwise. For the purposes of this Agreement, in no event shall the Purchaser or any of its Affiliates be deemed Affiliates of the Company or any of its Affiliates, nor shall the Company or any of its Affiliates be deemed Affiliates of the Purchaser or any of its Affiliates.

(d) "Agreement" has the meaning set forth in the preamble.

(e) "Board" means the Board of Directors of the Company.

(f) "Board Observer" has the meaning set forth in Section 2.4.

(g) "Board Right Termination Date" means the earlier of (i) the date on which Purchaser, together with its Affiliates, beneficially owns less than 4.99% of the Company's outstanding Common Stock and (ii) the date on which Doug Ingram is no longer an employee of the Purchaser or its Affiliates.

(h) "Business Day" means any day except Saturday, Sunday and any legal holiday or a day on which banking institutions in Cambridge, Massachusetts generally are authorized or required by law or other governmental actions to close.

(i) "Closing" means the date of the purchase and sale of the Shares and the Pre-Funded Warrant pursuant to the Purchase Agreement.

(j) "Collaboration Agreement" means the Exclusive License and Collaboration Agreement by and between the Company and the Purchaser, dated as of [●], 2024.

(k) "Common Stock" means the common stock of the Company, par value $0.001 per share.

(l) "Company Indemnitee" has the meaning set forth in Section 3.8.

(m) "Company Registration Statement" has the meaning set forth in Section 3.2.1.

(n) "Effectiveness Period" has the meaning set forth in Section 3.1.3.

(o) "Exchange Act" means the Securities Exchange Act of 1934, as amended, as in effect from time to time.

(p) "Filing Deadline" has the meaning set forth in Section 3.1.1.

(q) "FINRA" means the Financial Industry Regulatory Authority.

(r) "Holder" or "Holders" means the Purchaser, or such other holder or holders, as the case may be, from time to time of Registrable Securities.

(s) "Initial Registration Statement" has the meaning set forth in Section 3.1.1(a).

(t) "Issuer Free Writing Prospectus" means an issuer free writing prospectus, as defined in Rule 433 under the Securities Act, relating to an offer of the Registrable Securities.

(u) "Laws" mean all United States and foreign national, federal, state, and local laws, statutes, ordinances, rules, regulations, orders, treaties and decrees.

(v) "Loss" has the meaning set forth in Section 3.7.1.

(w) "New Registration Statement" has the meaning set forth in Section 3.1.1.

(x) "Permitted Transferee" means any Affiliate of the Purchaser.

(y) "Person" means any individual, firm, corporation, limited liability company, partnership, company or other entity, and shall include any successor (by merger or otherwise) of such entity.

(z) "Pre-Funded Warrant" means any pre-funded warrant to purchase Common Stock issued to the Purchaser pursuant to Section 6.9 of the Purchase Agreement.

(aa) "Prospectus" means (i) the prospectus included in any Registration Statement, all amendments and supplements to such prospectus, including post-effective amendments and supplements, and all other material incorporated by reference in such prospectus, and (ii) any Issuer Free Writing Prospectus.

(bb) "Public Offering" means the offer and sale of Registrable Securities for cash pursuant to an effective registration statement under the Securities Act (other than a registration statement on Form S-4 or Form S-8 or any successor form).

(cc) "Purchase Agreement" means the Stock Purchase Agreement, by and between the Company and the Purchaser, dated as of [●], 2024.

(dd) "Purchaser" has the meaning set forth in the preamble.

(ee) "Registrable Securities" means all of (i) the Shares, (ii) the Warrant Shares, and (iii) any securities issued or issuable upon any stock split, dividend or other distribution, recapitalization or similar event with respect to the foregoing, provided, that with respect to a particular Holder, such Holder's Shares and Warrant Shares shall cease to be Registrable Securities upon a sale pursuant to a Registration Statement or Rule 144 under the Securities Act (in which case, only such security sold by the Holder shall cease to be a Registrable Security).

(ff) "Registration" means registration under the Securities Act of the offer and sale to the public of any Registrable Securities under a Registration Statement. The terms "register", "registered" and "registering" shall have correlative meanings.

(gg) "Registration Expenses" has the meaning set forth in Section 3.6.

(hh) "Registration Statement" or "Registration Statements" means any one or more registration statements of the Company filed under the Securities Act that covers the resale of any of the Registrable Securities pursuant to the provisions of this Agreement (including the Initial Registration Statement, the New Registration Statement and, if applicable, any Additional Registration Statement), amendments and supplements to such Registration Statements, including post-effective amendments, all exhibits and all material incorporated by reference or deemed to be incorporated by reference in such Registration Statements.

(ii) "Representatives" means, with respect to any Person, any of such Person's officers, directors, employees, agents, attorneys, accountants, actuaries, consultants, equity financing partners or financial advisors or other Person associated with, or acting on behalf of, such Person.

(jj) "Rule 144" means Rule 144 under the Securities Act (or any successor rule).

(kk) "SEC" means the Securities and Exchange Commission.

(ll) "Securities Act" means the Securities Act of 1933, as amended.

(mm) "Selling Stockholder Information" has the meaning set forth in Section 3.7.1.

(nn) "Shares" means the shares of Common Stock issued or issuable to the Purchaser pursuant to the Purchase Agreement.

(oo) "Shelf Takedown Request" has the meaning set forth in Section 3.1.4(a).

(pp) "Suspension" has the meaning set forth in Section 3.1.3.

(qq) "Transfer" means, with respect to any Registrable Security, any interest therein, or any other securities or equity interests relating thereto, a direct or indirect transfer, sale, exchange, assignment, pledge, hypothecation or other encumbrance or other disposition thereof, including the grant of an option or other right, whether directly or indirectly, whether voluntarily, involuntarily, by operation of law, pursuant to judicial process or otherwise. "Transferred" shall have a correlative meaning.

(rr) "Underwritten Public Offering" means an underwritten Public Offering, including any bought deal or block sale to a financial institution conducted as an underwritten Public Offering.

(ss) "Underwritten Shelf Takedown" means an Underwritten Public Offering pursuant to the Initial Registration Statement or a New Registration Statement.

(tt) "Warrant Shares" means the shares of Common Stock issued or issuable upon exercise of a Pre-Funded Warrant.

Construction. Whenever required by the context, any pronoun used in this Agreement shall include the corresponding masculine, feminine or neuter forms, and the singular forms of nouns, pronouns, and verbs shall include the plural and vice versa. Reference to any agreement, document, or instrument means such agreement, document, or instrument as amended or otherwise modified from time to time in accordance with the terms thereof and, if applicable, hereof. A reference to any party hereto includes such party's permitted assignees and/or the respective successors in title to substantially the whole of such party's undertaking. All references to "Sections" contained in this Agreement are, unless specifically indicated otherwise, references to sections, schedules, or exhibits of or to this Agreement. The recitals, schedules and exhibits to this Agreement form part of the operative provisions of this Agreement and references to this Agreement shall, unless the context otherwise requires, include references to the recitals to this Agreement. As used in this Agreement, the following terms shall have the meanings indicated: (a) "day" means a calendar day; (b) "U.S." or "United States" means the United States of America; (c) "dollar" or "$" means

lawful currency of the United States; (d) "including" or "include" means "including without limitation"; and (e) references in this Agreement to specific laws includes the succeeding law, section, or provision corresponding thereto and the rules and regulations promulgated thereunder.

BOARD RIGHTS

Appointment of Director. The Board shall appoint Doug Ingram to be a member of the Board effective as of the Closing. Until the Board Right Termination Date, at the end of each of Mr. Ingram's terms as a member of the Board, provided that Mr. Ingram continues to meet legal, regulatory and stock market requirements to serve as a member of the Board, the Company shall cause Mr. Ingram to be nominated for re-election as a director as part of the slate proposed by the Board that is included in the proxy statement (or consent solicitation or similar document) of the Company relating to the election of the Board, and the Company will use all commercially reasonable efforts to cause the election of Mr. Ingram to the Board, including providing the same level of support as is provided for other nominees of the Company to the Board.

Expenses and Policies. The Company shall compensate and reimburse the expenses of Mr. Ingram consistent with the Company's policies on business expense reimbursement and shall indemnify him and provide him with director and officer liability insurance to the same extent it indemnifies and provides insurance for the other non-employee members of the Board pursuant to its organizational documents, applicable law or otherwise.

Board Observer. If, prior to the date on which Purchaser, together with its Affiliates, beneficially owns less than 4.99% of the Company's outstanding Common Stock, Mr. Ingram is no longer an employee of Purchaser, Purchaser shall have the right to appoint one individual as a non-voting observer to the Board (the "Board Observer"), and the Board Observer shall be entitled to attend meetings of the Board and to receive all information provided to the members of the Board; provided, however, that the Company reserves the right to withhold any information and to exclude the Board Observer from any meeting or portion thereof if the Board determines in good faith and based upon the advice of counsel that access to such information or attendance at such meeting would reasonably be expected to (a) adversely affect the attorney-client privilege between the Company and its counsel or (b) result in a conflict of interest. The Board Observer shall have such rights until the earlier of (x) such time as when the Purchaser, together with its Affiliates, beneficially owns less than 4.99% of the Company's outstanding Common Stock and (y) January 1, 2030. The Company and the Board Observer shall enter into a board observer agreement in form and substance to be mutually agreed upon between the Company and the Purchaser at the time the Board Observer is appointed pursuant to this Section 2.3.

Information Rights. During such time that Mr. Ingram is a member of the Company's Board of Directors or the Purchaser has a right to appoint a Board Observer pursuant to Section 2.3, the Purchaser and its Affiliates will be entitled to receive any information that Mr. Ingram or the Board Observer receives or is entitled to receive; provided, however, that the Purchaser and its Affiliates may make such information available only to individuals who have a need to know such information for purposes of the Collaboration Agreement or the Purchaser's or any Affiliate's investment in the Company, including any outside service providers subject to a duty of

confidentiality to the Purchaser or any Affiliate, such as auditors and legal counsel; provided, further, that the Company reserves the right to withhold any information or portion thereof from the Purchaser and its Affiliates if the Board determines in good faith and based upon the advice of counsel, that access to such information or attendance at such meeting would reasonably be expected to (a) adversely affect the attorney-client privilege between the Company and its counsel or (b) result in a conflict of interest.

REGISTRATION RIGHTS

The Company will perform and comply, and cause each of its subsidiaries to perform and comply, with such of the following provisions as are applicable to it. Each Holder will perform and comply with such of the following provisions as are applicable to such Holder.

Registration.

Request for Registration.

As promptly as possible, and in any event within thirty (30) calendar days of the Closing (the "Filing Deadline"), the Company shall file with the SEC a shelf Registration Statement pursuant to Rule 415 under the Securities Act or, if Rule 415 is not available for offers and sales of the Registrable Securities, by such other means of distribution of Registrable Securities as the Holders may reasonably specify (the "Initial Registration Statement"), relating to the offer and sale of Registrable Securities by any Holders thereof from time to time in accordance with the methods of distribution elected by such Holders, and the Company shall use its reasonable best efforts to cause the Initial Registration Statement to promptly become effective under the Securities Act, provided, however, that the Company shall be permitted to file a post-effective amendment or Prospectus supplement to any effective shelf Registration Statement in lieu of filing a new Registration Statement to the extent the Company determines, and the Holders agree, that the Registrable Securities may be sold thereunder by the Holders pursuant to their intended plan of distribution.

Notwithstanding the registration obligations set forth in this Section 3.1.1, in the event the SEC informs the Company that all of the Registrable Securities cannot, as a result of the application of Rule 415, be registered for resale as a secondary offering on a single registration statement, the Company agrees to promptly (i) inform each of the Holders thereof and use its commercially reasonable efforts to file amendments to the Initial Registration Statement as required by the SEC and/or (ii) withdraw the Initial Registration Statement and file a new registration statement (a "New Registration Statement"), in either case covering the maximum number of Registrable Securities permitted to be registered by the SEC, on Form S-3 or such other form available to register for resale the Registrable Securities as a secondary offering; provided, however, that prior to filing such amendment or New Registration Statement, the Company shall be obligated to use its commercially reasonable efforts to advocate with the SEC for the registration of all of the Registrable Securities. Notwithstanding any other provision of this Agreement, if the SEC limits the number of Registrable Securities permitted to be registered on a particular Registration Statement as a secondary offering (and notwithstanding that the Company

used diligent efforts to advocate with the SEC for the registration of all or a greater number of Registrable Securities), unless otherwise directed in writing by a Holder as to its Registrable Securities, the number of Registrable Securities to be registered on such Registration Statement will be reduced: first by Registrable Securities not acquired pursuant to the Purchase Agreement (whether pursuant to registration rights or otherwise); second by Registrable Securities represented by the Pre-Funded Warrant; and third by Registrable Securities represented by Shares. In the event the Company amends the Initial Registration Statement or files a New Registration Statement, as the case may be, under clauses (i) or (ii) above, the Company will use its commercially reasonable efforts to file with the SEC, as promptly as allowed by SEC, one or more registration statements on Form S-3 or such other form available to register for resale those Registrable Securities that were not registered for resale on the Initial Registration Statement, as amended, or the New Registration Statement.

As promptly as possible, and in any event within thirty (30) calendar days of the issuance of any Pre-Funded Warrant pursuant to Section 6.9 of the Purchase Agreement, the Company shall file with the SEC a shelf Registration Statement pursuant to Rule 415 under the Securities Act or, if Rule 415 is not available for offers and sales of the Registrable Securities, by such other means of distribution of Registrable Securities as the Holders may reasonably specify (an "Additional Registration Statement"), relating to the offer and sale of Registrable Securities underlying such Pre-Funded Warrant by any Holders thereof from time to time in accordance with the methods of distribution elected by such Holders, and the Company shall use its reasonable best efforts to cause the Additional Registration Statement to promptly become effective under the Securities Act, provided, however, that the Company shall be permitted to file a post-effective amendment or Prospectus supplement to any effective shelf Registration Statement in lieu of filing an Additional Registration Statement to the extent the Company determines, and the Holders agree, that the Registrable Securities may be sold thereunder by the Holders pursuant to their intended plan of distribution.

Continued Effectiveness. The Company shall use its reasonable best efforts to keep such Registration Statement continuously effective under the Securities Act in order to permit the Prospectus forming part of the Registration Statement to be usable by Holders until the date as of which no Holder holds Registrable Securities (such period of effectiveness, the "Effectiveness Period"). Subject to Section 3.1.3, the Company shall be deemed not to have used its reasonable best efforts to keep the Registration Statement effective during the Effectiveness Period if the Company voluntarily takes any action or omits to take any action that would result in Holders of the Registrable Securities covered thereby not being able to offer and sell any Registrable Securities pursuant to such Registration Statement during the Effectiveness Period, unless such action or omission is required by applicable law.

Suspension of Registration. If the continued use of such Registration Statement at any time would require the Company to make an Adverse Disclosure, the Company may, upon giving prompt written notice of such action to the Holders, suspend use of the Registration Statement (a "Suspension"); provided, however, that the Company shall not be permitted to exercise a Suspension more than one time during any twelve (12)-month period for a period not to exceed sixty (60) days. In the case of a Suspension, the Holders agree to suspend use of the applicable Prospectus in connection with any sale or purchase of, or offer to sell or purchase, Registrable Securities, upon receipt of the notice referred to above. The Company shall

immediately notify the Holders in writing upon the termination of any Suspension, amend or supplement the Prospectus, if necessary, so it does not contain any untrue statement or omission and furnish to the Holders such numbers of copies of the Prospectus as so amended or supplemented as the Holders may reasonably request. The Company shall, if necessary, supplement or amend the Registration Statement, if required by the registration form used by the Company for the Registration Statement or by the instructions applicable to such registration form or by the Securities Act or the rules or regulations promulgated thereunder or as may reasonably be requested by the Holders of a majority of Registrable Securities that are included in such Registration Statement.

Shelf Takedown. During the Effectiveness Period, by notice to the Company specifying the intended method or methods of disposition thereof, the Purchaser may make a written request (a "Shelf Takedown Request") to the Company to effect a Public Offering, including an Underwritten Shelf Takedown, of all or a portion of the Registrable Securities that may be registered under such Registration Statement, and as soon as practicable the Company shall amend or supplement the Registration Statement as necessary for such purpose.

Statutory Underwriters. Notwithstanding anything to the contrary contained herein, in no event shall the Company be permitted to name any Holder or affiliate of a Holder as an underwriter without the prior written consent of such Holder. In no event shall any Holder be identified as a statutory underwriter in any Registration Statement; provided, however, that if the Commission requests that a Holder be identified as a statutory underwriter in the Registration Statement, such Holder will have an opportunity to withdraw from the Registration Statement.

Registration Procedures.

Requirements. In connection with the Company's obligations under Section 3.1, the Company shall use its reasonable best efforts to effect such Registration and to permit the sale of such Registrable Securities in accordance with the intended method or methods of distribution thereof as expeditiously as reasonably practicable, and in connection therewith the Company shall:

Before filing a Registration Statement or Prospectus or any amendments or supplements thereto, (x) furnish to the underwriters, if any, and to the Holders of the Registrable Securities covered by such Registration Statement, copies of all documents prepared to be filed, which documents shall be subject to the review of such underwriters and such Holders and their respective counsel and (y) make such changes in such documents concerning the Holders prior to the filing thereof as such Holders, or their counsel, may reasonably request;

prepare and file with the SEC such amendments and post-effective amendments to such Registration Statement and supplements to the Prospectus as may be (x) reasonably requested by any Holder with Registrable Securities covered by such Registration Statement, (y) reasonably requested by any participating Holder (to the extent such request relates to information relating to such Holder), or (z) necessary to keep such Registration Statement effective during the Effectiveness Period, and comply with provisions of the applicable securities laws with respect to the sale or other disposition of all securities covered by such Registration Statement during such period in accordance with the intended method or methods of disposition by the sellers thereof set forth in such Registration Statement;

notify the participating Holders and the managing underwriter or underwriters, if any, and (if requested) confirm such notice in writing and provide copies of the relevant documents, as soon as reasonably practicable after notice thereof is received by the Company (a) when the applicable Registration Statement or any amendment thereto has been filed or becomes effective, and when the applicable Prospectus or any amendment or supplement thereto has been filed, (b) of any written comments by the SEC, or any request by the SEC or other federal or state governmental authority for amendments or supplements to such Registration Statement or such Prospectus, or for additional information (whether before or after the effective date of the Registration Statement) or any other correspondence with the SEC relating to, or which may affect, the Registration, (c) of the issuance by the SEC of any stop order suspending the effectiveness of such Registration Statement or any order by the SEC or any other regulatory authority preventing or suspending the use of any preliminary or final Prospectus or the initiation or threatening of any proceedings for such purposes, (d) if, at any time, the representations and warranties of the Company in any applicable underwriting agreement cease to be true and correct in all material respects and (e) of the receipt by the Company of any notification with respect to the suspension of the qualification of the Registrable Securities for offering or sale in any jurisdiction or the initiation or threatening of any proceeding for such purpose;

promptly notify each selling Holder and the managing underwriter or underwriters, if any, when the Company becomes aware of the happening of any event as a result of which the applicable Registration Statement or the Prospectus included in such Registration Statement contains any untrue statement of a material fact or omits to state a material fact necessary to make the statements therein (in the case of such Prospectus or any preliminary Prospectus, in light of the circumstances under which they were made) not misleading, when any Issuer Free Writing Prospectus includes information that may conflict with the information contained in the Registration Statement, or, if for any other reason it shall be necessary during such time period to amend or supplement such Registration Statement or Prospectus in order to comply with the Securities Act and, as promptly as reasonably practicable thereafter, prepare and file with the SEC, and furnish without charge to the selling Holders and the managing underwriter or underwriters, if any, an amendment or supplement to such Registration Statement or Prospectus, which shall correct such misstatement or omission or effect such compliance;

to the extent the Company is eligible under the relevant provisions of Rule 430B under the Securities Act, the Company shall include in the applicable Registration Statement such disclosures as may be required by Rule 430B under the Securities Act (referring to the unnamed selling security holders in a generic manner by identifying the initial offering of the securities to the Holders) in order to ensure that the Holders may be added to such Registration Statement at a later time through the filing of a Prospectus supplement rather than a post-effective amendment;

use its reasonable best efforts to prevent, or obtain the withdrawal of, any stop order or other order or notice preventing or suspending the use of any preliminary or final Prospectus;

promptly incorporate in a Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment such information as the managing underwriter or underwriters and the Purchaser agree should be included therein relating to the plan of distribution with respect to such Registrable Securities; and make all required filings of such Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment as soon as reasonably practicable after being

notified of the matters to be incorporated in such Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment;

furnish to each selling Holder and each underwriter, if any, without charge, as many conformed copies as such Holder or underwriter may reasonably request of the applicable Registration Statement and any amendment or post-effective amendment or supplement thereto, including financial statements and schedules, all documents incorporated therein by reference and all exhibits (including those incorporated by reference);

deliver to each selling Holder and each underwriter, if any, without charge, as many copies of the applicable Prospectus (including each preliminary Prospectus) and any amendment or supplement thereto and such other documents as such Holder or underwriter may reasonably request in order to facilitate the disposition of the Registrable Securities by such Holder or underwriter (it being understood that the Company shall consent to the use of such Prospectus or any amendment or supplement thereto by each of the selling Holders and the underwriters, if any, in connection with the offering and sale of the Registrable Securities covered by such Prospectus or any amendment or supplement thereto);

on or prior to the date on which the applicable Registration Statement becomes effective, use its reasonable best efforts to register or qualify in connection with the Registration or qualification of such Registrable Securities for offer and sale under the securities or "Blue Sky" laws of each state and other jurisdiction as any such selling Holder or managing underwriter or underwriters, if any, or their respective counsel reasonably request in writing and do any and all other acts or things reasonably necessary or advisable to keep such Registration or qualification in effect for the Effectiveness Period, provided that the Company shall not be required to qualify generally to do business in any jurisdiction where it is not then so qualified or to take any action which would subject it to taxation or general service of process in any such jurisdiction where it is not then so subject;

cooperate with the selling Holders and the managing underwriter or underwriters, if any, to facilitate the timely preparation and delivery of certificates representing Registrable Securities to be sold and not bearing any restrictive legends and enable such Registrable Securities to be in such denominations and registered in such names as the managing underwriters may request prior to any sale of Registrable Securities to the underwriters;

use its reasonable best efforts to cause the Registrable Securities covered by the applicable Registration Statement to be registered with or approved by such other governmental agencies or authorities as may be necessary to enable the seller or sellers thereof or the underwriter or underwriters, if any, to consummate the disposition of such Registrable Securities;

make such representations and warranties to the Holders being registered, and the underwriters or agents, if any, in form, substance and scope as are customarily made by issuers in public offerings similar to the offering then being undertaken;

enter into such customary agreements (including underwriting and indemnification agreements) and take all such other actions as the Purchaser or the managing underwriter or underwriters, if any, reasonably request in order to expedite or facilitate the Registration and

disposition of such Registrable Securities;

obtain for delivery to the Holders and to the underwriter or underwriters, if any, an opinion or opinions from counsel for the Company dated the most recent effective date of the Registration Statement or, in the event of an Underwritten Public Offering, the date of the closing under the underwriting agreement, in customary form, scope and substance, which opinions shall be reasonably satisfactory to such Holders or underwriters, as the case may be, and their respective counsel;

in the case of an Underwritten Public Offering, obtain for delivery to the Company and the managing underwriter or underwriters, with copies to the Holders included in such Registration or sale, a comfort letter from the Company's independent certified public accountants or independent auditors (and, if necessary, any other independent certified public accountants or independent auditors of any subsidiary of the Company or any business acquired by the Company for which financial statements and financial data are, or are required to be, included in the Registration Statement) in customary form and covering such matters of the type customarily covered by comfort letters as the managing underwriter or underwriters reasonably request, dated the date of execution of the underwriting agreement and brought down to the closing under the underwriting agreement;

cooperate with each seller of Registrable Securities and each underwriter, if any, participating in the disposition of such Registrable Securities and their respective counsel in connection with any filings required to be made with FINRA;

provide and cause to be maintained a transfer agent and registrar for all Registrable Securities covered by the applicable Registration Statement;

use its reasonable best efforts to cause all Registrable Securities covered by the applicable Registration Statement to be listed on each securities exchange on which any of the Company's equity securities are then listed or quoted and on each inter-dealer quotation system on which any of the Company's equity securities are then quoted;

make available upon reasonable notice at reasonable times and for reasonable periods for inspection by the Purchaser, by any underwriter participating in any disposition to be effected pursuant to such Registration Statement and by any attorney, accountant or other agent retained by the Purchaser or any such underwriter, all pertinent financial and other records and pertinent corporate documents and properties of the Company, and cause all of the Company's officers, directors and employees and the independent public accountants who have certified its financial statements to make themselves available to discuss the business of the Company and to supply all information reasonably requested by any such Person in connection with such Registration Statement;

in the case of an Underwritten Public Offering, cause the senior executive officers of the Company to participate in the customary "road show" presentations that may be reasonably requested by the managing underwriter or underwriters in any such offering and otherwise to facilitate, cooperate with, and participate in each proposed offering contemplated herein and customary selling efforts related thereto;

take no direct or indirect action prohibited by Regulation M under the Exchange Act;

take all reasonable action to ensure that any Issuer Free Writing Prospectus utilized in connection with any Registration complies in all material respects with the Securities Act, is filed in accordance with the Securities Act to the extent required thereby, is retained in accordance with the Securities Act to the extent required thereby and, when taken together with the related Prospectus, will not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements therein, in light of the circumstances under which they were made, not misleading; and

take all such other commercially reasonable actions as are necessary or advisable in order to expedite or facilitate the disposition of such Registrable Securities in accordance with the terms of this Agreement.

Company Information Requests. The Company may require each seller of Registrable Securities as to which any Registration or sale is being effected to furnish to the Company such information regarding the distribution of such securities and such other information relating to such Holder and its ownership of Registrable Securities as the Company may from time to time reasonably request in writing. Each Holder agrees to furnish such information to the Company and to cooperate with the Company as reasonably necessary to enable the Company to comply with the provisions of this Agreement.

Discontinuing Registration. Each Holder agrees that, upon receipt of any notice from the Company of the happening of any event of the kind described in Section 3.2.1(d), such Holder will discontinue disposition of Registrable Securities pursuant to such Registration Statement until such Holder's receipt of the copies of the supplemented or amended Prospectus contemplated by Section 3.2.1(d), or until such Holder is advised in writing by the Company that the use of the Prospectus may be resumed, and has received copies of any additional or supplemental filings that are incorporated by reference in the Prospectus, or any amendments or supplements thereto, and if so directed by the Company, such Holder shall deliver to the Company (at the Company's expense) all copies, other than permanent file copies then in such Holder's possession, of the Prospectus covering such Registrable Securities current at the time of receipt of such notice.

Underwritten Offerings.

Shelf Registrations. If requested by the underwriters for any Underwritten Shelf Takedown, pursuant to a Registration or sale under Section 3.1, the Company shall enter into an underwriting agreement with such underwriters, such agreement to be reasonably satisfactory in substance and form to each of the Company, the Purchaser and the underwriters, and to contain such representations and warranties by the Company and such other terms as are generally prevailing in agreements of that type, including indemnities no less favorable to the recipient thereof than those provided in Section 3.6 of this Agreement. The Holders of the Registrable Securities proposed to be distributed by such underwriters shall cooperate with the Company in the negotiation of the underwriting agreement and shall give consideration to the reasonable suggestions of the Company regarding the form thereof, and such Holders shall complete and

execute all questionnaires, powers of attorney and other documents reasonably requested by the underwriters and required under the terms of such underwriting arrangements. Any such Holder shall not be required to make any representations or warranties to or agreements with the Company or the underwriters other than representations, warranties or agreements regarding such Holder, such Holder's title to the Registrable Securities, such Holder's intended method of distribution and any other representations to be made by the Holder as are generally prevailing in agreements of that type, and the aggregate amount of the liability of such Holder under such agreement shall not exceed such Holder's proceeds from the sale of its Registrable Securities in the offering, net of underwriting discounts and commissions but before expenses.

Selection of Underwriters; Selection of Counsel. In the case of an Underwritten Shelf Takedown under Section 3.1, the managing underwriter or underwriters to administer the offering shall be determined by the Purchaser and counsel to the Holders shall be Ropes & Gray LLP unless otherwise agreed by the Company and the Purchaser.

No Inconsistent Agreements; Additional Rights. Neither the Company nor any of its subsidiaries shall hereafter enter into, and neither the Company nor any of its subsidiaries is currently a party to, any agreement with respect to its securities that is inconsistent with the rights granted to the Holders by this Agreement. The Company hereby represents and warrants that, as of the date hereof, no registration or similar rights have been granted to any other Person other than pursuant to this Agreement.

Registration Expenses. All expenses incident to the Company's performance of or compliance with this Agreement shall be paid by the Company, including (i) all registration and filing fees, and any other fees and expenses associated with filings required to be made with the SEC or FINRA, (ii) all fees and expenses in connection with compliance with any securities or "Blue Sky" laws (including reasonable fees and disbursements of counsel for the underwriters in connection with blue sky qualifications of the Registrable Securities), (iii) all printing, duplicating, word processing, messenger, telephone, facsimile and delivery expenses (including expenses of printing certificates for the Registrable Securities in a form eligible for deposit with The Depository Trust Company and of printing Prospectuses), (iv) all fees and disbursements of counsel for the Company and of all independent certified public accountants or independent auditors of the Company and any subsidiaries of the Company (including the expenses of any special audit and comfort letters required by or incident to such performance), (v) Securities Act liability insurance or similar insurance if the Company so desires or the underwriters so require in accordance with then-customary underwriting practice, (vi) all fees and expenses incurred in connection with the listing of the Registrable Securities on any securities exchange or quotation of the Registrable Securities on any inter-dealer quotation system, (viii) all reasonable fees and disbursements of one legal counsel for the selling Holders, (ix) any reasonable fees and disbursements of underwriters customarily paid by issuers or sellers of securities, (x) all fees and expenses incurred in connection with the distribution or Transfer of Registrable Securities to or by a Holder or its Permitted Transferees in connection with a Public Offering, (xi) all fees and expenses of any special experts or other Persons retained by the Company in connection with any Registration or sale, (xii) all of the Company's internal expenses (including all salaries and expenses of its officers and employees performing legal or accounting duties) and (xiii) all expenses related to the "road show" for any Underwritten Public Offering, including the reasonable out-of-pocket expenses of the Holders and underwriters, if so requested. All such

expenses are referred to herein as "Registration Expenses". The Company shall not be required to pay any fees and disbursements to underwriters not customarily paid by the issuers of securities in an offering similar to the applicable offering, including underwriting discounts and commissions and transfer taxes, if any, attributable to the sale of Registrable Securities.

Indemnification.

Indemnification by the Company. The Company shall indemnify and hold harmless, to the full extent permitted by law, each Holder, each shareholder, member, limited or general partner of such Holder, each shareholder, member, limited or general partner of each such shareholder, member, limited or general partner, each of their respective Affiliates, officers, directors, shareholders, employees, advisors, and agents and each Person who controls (within the meaning of the Securities Act or the Exchange Act) such Persons and each of their respective Representatives from and against any and all losses, penalties, judgments, suits, costs, claims, damages, liabilities and expenses, joint or several (including reasonable costs of investigation and legal expenses and any indemnity and contribution payments made to underwriters) (each, a "Loss" and collectively "Losses") arising out of or based upon (i) any untrue or alleged untrue statement of a material fact contained in any Registration Statement under which such Registrable Securities are registered or sold under the Securities Act (including any final, preliminary or summary Prospectus contained therein or any amendment thereof or supplement thereto or any documents incorporated by reference therein) or any other disclosure document produced by or on behalf of the Company or any of its subsidiaries including any report and other document filed under the Exchange Act, (ii) any omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein (in the case of a Prospectus or preliminary Prospectus, in light of the circumstances under which they were made) not misleading or (iii) any violation or alleged violation by the Company or any of its subsidiaries of any federal, state, foreign or common law rule or regulation applicable to the Company or any of its subsidiaries and relating to action or inaction in connection with any such registration, disclosure document or other document or report; provided, that no selling Holder shall be entitled to indemnification pursuant to this Section 3.6.1 in respect of any untrue statement or omission contained in any information relating to such seller Holder furnished in writing by such selling Holder to the Company specifically for inclusion in a Registration Statement and used by the Company in conformity therewith (such information "Selling Stockholder Information"). This indemnity shall be in addition to any liability the Company may otherwise have. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of such Holder or any indemnified party and shall survive the Transfer of such securities by such Holder and regardless of any indemnity agreed to in the underwriting agreement that is less favorable to the Holders. The Company shall also indemnify underwriters, selling brokers, dealer managers and similar securities industry professionals participating in the distribution, their officers and directors and each Person who controls such Persons (within the meaning of the Securities Act and the Exchange Act) to the same extent as provided above (with appropriate modification) with respect to the indemnification of the indemnified parties.

Indemnification by the Selling Holders. Each selling Holder agrees (severally and not jointly) to indemnify and hold harmless, to the fullest extent permitted by law, the Company, its directors and officers and each Person who controls the Company (within the meaning of the Securities Act or the Exchange Act) from and against any Losses resulting from (i) any untrue

statement of a material fact in any Registration Statement under which such Registrable Securities were registered or sold under the Securities Act (including any final, preliminary or summary Prospectus contained therein or any amendment thereof or supplement thereto or any documents incorporated by reference therein) or (ii) any omission to state therein a material fact required to be stated therein or necessary to make the statements therein (in the case of a Prospectus or preliminary Prospectus, in light of the circumstances under which they were made) not misleading, in each case to the extent, but only to the extent, that such untrue statement or omission is contained in such selling Holder's Selling Stockholder Information. In no event shall the liability of any selling Holder hereunder be greater in amount than the dollar amount of the proceeds from the sale of its Registrable Securities in the offering giving rise to such indemnification obligation, net of underwriting discounts and commissions but before expenses, less any amounts paid by such Holder pursuant to Section 3.6.4 and any amounts paid by such Holder as a result of liabilities incurred under the underwriting agreement, if any, related to such sale.

Conduct of Indemnification Proceedings. Any Person entitled to indemnification hereunder shall (i) give prompt written notice to the indemnifying party of any claim with respect to which it seeks indemnification (provided that any delay or failure to so notify the indemnifying party shall relieve the indemnifying party of its obligations hereunder only to the extent, if at all, that it forfeits substantive legal rights by reason of such delay or failure) and (ii) permit such indemnifying party to assume the defense of such claim with counsel reasonably satisfactory to the indemnified party; provided, however, that any Person entitled to indemnification hereunder shall have the right to select and employ separate counsel and to participate in the defense of such claim, but the fees and expenses of such counsel shall be at the expense of such Person unless (i) the indemnifying party has agreed in writing to pay such fees or expenses, (ii) the indemnifying party shall have failed to assume the defense of such claim within a reasonable time after receipt of notice of such claim from the Person entitled to indemnification hereunder and employ counsel reasonably satisfactory to such Person, (iii) the indemnified party has reasonably concluded (based upon advice of its counsel) that there may be legal defenses available to it or other indemnified parties that are different from or in addition to those available to the indemnifying party, or (iv) in the reasonable judgment of any such Person (based upon advice of its counsel) a conflict of interest may exist between such Person and the indemnifying party with respect to such claims (in which case, if the Person notifies the indemnifying party in writing that such Person elects to employ separate counsel at the expense of the indemnifying party, the indemnifying party shall not have the right to assume the defense of such claim on behalf of such Person). If the indemnifying party assumes the defense, the indemnifying party shall not have the right to settle such action without the consent of the indemnified party. No indemnifying party shall consent to entry of any judgment or enter into any settlement which does not include as an unconditional term thereof the giving by the claimant or plaintiff to such indemnified party of an unconditional release from all liability in respect to such claim or litigation without the prior written consent of such indemnified party. If such defense is not assumed by the indemnifying party, the indemnifying party will not be subject to any liability for any settlement made without its prior written consent, but such consent may not be unreasonably withheld. It is understood that the indemnifying party or parties shall not, except as specifically set forth in this Section 3.6.3, in connection with any proceeding or related proceedings in the same jurisdiction, be liable for the reasonable fees, disbursements or other charges of more than one separate firm admitted to practice in such jurisdiction at any one time unless (x) the employment of more than one counsel has been authorized in writing by the indemnifying party or parties, (y) an indemnified party has reasonably concluded (based on the

advice of counsel) that there may be legal defenses available to it that are different from or in addition to those available to the other indemnified parties or (z) a conflict or potential conflict exists or may exist (based upon advice of counsel to an indemnified party) between such indemnified party and the other indemnified parties, in each of which cases the indemnifying party shall be obligated to pay the reasonable fees and expenses of such additional counsel or counsels.

Contribution. If for any reason the indemnification provided for in Section 3.6.1 and Section 3.6.2 is unavailable to an indemnified party or insufficient in respect of any Losses referred to therein (other than as a result of exceptions or limitations on indemnification contained in Section 3.6.1 and Section 3.6.2), then the indemnifying party shall contribute to the amount paid or payable by the indemnified party as a result of such Loss in such proportion as is appropriate to reflect the relative fault of the indemnifying party on the one hand and the indemnified party or parties on the other hand in connection with the acts, statements or omissions that resulted in such Losses, as well as any other relevant equitable considerations. In connection with any Registration Statement filed with the SEC by the Company, the relative fault of the indemnifying party on the one hand and the indemnified party on the other hand shall be determined by reference to, among other things, whether any untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the indemnifying party or by the indemnified party and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission. The parties hereto agree that it would not be just or equitable if contribution pursuant to this Section 3.6.4 were determined by pro rata allocation or by any other method of allocation that does not take account of the equitable considerations referred to in this Section 3.6.4. No Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation. The amount paid or payable by an indemnified party as a result of the Losses referred to in Sections 3.6.1 and 3.6.2 shall be deemed to include, subject to the limitations set forth above, any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending any such action or claim. Notwithstanding the provisions of this Section 3.6.4, in connection with any Registration Statement filed by the Company, a selling Holder shall not be required to contribute any amount in excess of the dollar amount of the proceeds from the sale of its Registrable Securities in the offering giving rise to such indemnification obligation, net of underwriting discounts and commissions but before expenses, less any amounts paid by such Holder pursuant to Section 3.6.2 and any amounts paid by such Holder as a result of liabilities incurred under the underwriting agreement, if any, related to such sale. If indemnification is available under this Section 3.6, the indemnifying parties shall indemnify each indemnified party to the full extent provided in Sections 3.6.1 and 3.6.2 hereof without regard to the provisions of this Section 3.6.4. The remedies provided for in this Section 3.6 are not exclusive and shall not limit any rights or remedies which may otherwise be available to any indemnified party at law or in equity.

Indemnification Priority. The Company hereby acknowledges and agrees that any of the Persons entitled to indemnification pursuant to Section 3.6.1 (each, a "Company Indemnitee" and collectively, the "Company Indemnitees") may have certain rights to indemnification, advancement of expenses and/or insurance provided by other sources. The Company hereby acknowledges and agrees (i) that it is the indemnitor of first resort (i.e., its obligations to a Company Indemnitee are primary and any obligation of such other sources to advance expenses or to provide indemnification for the same expenses or liabilities incurred by such Company

Indemnitee are secondary) and (ii) that it shall be required to advance the full amount of expenses incurred by a Company Indemnitee and shall be liable for the full amount of all expenses, judgments, penalties, fines and amounts paid in settlement to the extent legally permitted and as required by the terms of this Agreement without regard to any rights a Company Indemnitee may have against such other sources. The Company further agrees that no advancement or payment by such other sources on behalf of a Company Indemnitee with respect to any claim for which such Company Indemnitee has sought indemnification, advancement of expenses or insurance from the Company shall affect the foregoing, and that such other sources shall have a right of contribution and/or be subrogated to the extent of such advancement or payment to all of the rights of recovery of such Company Indemnitee against the Company.

Rules 144 and 144A and Regulation S. The Company shall file the reports required to be filed by it under the Securities Act and the Exchange Act and the rules and regulations adopted by the SEC thereunder (or, if the Company is not required to file such reports, it will, upon the request of any Holder, make publicly available such necessary information for so long as necessary to permit sales that would otherwise be permitted by this Agreement pursuant to Rule 144, Rule 144A or Regulation S under the Securities Act, as such rules may be amended from time to time or any similar rule or regulation hereafter adopted by the SEC), and it will take such further action as any Holder may reasonably request, all to the extent required from time to time to enable such Holder to sell Registrable Securities without Registration under the Securities Act in transactions that would otherwise be permitted by this Agreement and within the limitation of the exemptions provided by (i) Rule 144, Rule 144A or Regulation S under the Securities Act, as such rules may be amended from time to time, or (ii) any similar rule or regulation hereafter adopted by the SEC. Upon the request of any Holder, the Company will deliver to such Holder a written statement as to whether it has complied with such requirements and, if not, the specifics thereof.

Existing Registration Statements. Notwithstanding anything herein to the contrary and subject to applicable law and regulation, the Company may satisfy any obligation hereunder to file a Registration Statement or to have a Registration Statement become effective by a specified date by designating, by notice to the Holders, a Registration Statement that previously has been filed with the SEC or become effective, as the case may be, as the relevant Registration Statement for purposes of satisfying such obligation, and all references to any such obligation shall be construed accordingly; provided, that such previously filed Registration Statement may be, and is, amended or, subject to applicable securities laws, supplemented to add the number of Registrable Securities, and, to the extent necessary, to identify as selling stockholders those Holders demanding the filing of a Registration Statement pursuant to the terms of this Agreement. To the extent this Agreement refers to the filing or effectiveness of other Registration Statements, by or at a specified time and the Company has, in lieu of then filing such Registration Statements or having such Registration Statements become effective, designated a previously filed or effective Registration Statement as the relevant Registration Statement for such purposes, in accordance with the preceding sentence, such references shall be construed to refer to such designated Registration Statement, as amended or supplemented in the manner contemplated by the immediately preceding sentence.

MISCELLANEOUS

Termination and Effect of Termination. This Agreement shall terminate upon the date on which no Holder holds any Registrable Securities, except for the provisions of Sections 3.6 and 3.7, which shall survive any such termination. No termination under this Agreement shall relieve any Person of liability for breach or Registration Expenses incurred prior to termination. In the event this Agreement is terminated, each Person entitled to indemnification rights pursuant to Section 3.6 hereof shall retain such indemnification rights with respect to any matter that (i) may be an indemnified liability thereunder and (ii) occurred prior to such termination.

Permitted Transferees; Assignment. The rights of a Holder hereunder may be assigned (but only with all related obligations as set forth below) in connection with a Transfer of Registrable Securities to a Permitted Transferee of that Holder. Without prejudice to any other or similar conditions imposed hereunder with respect to any such Transfer, no assignment permitted under the terms of this Section 4.2 will be effective unless the Permitted Transferee to which the assignment is being made, if not a Holder, has delivered to the Company a written acknowledgment and agreement in form and substance reasonably satisfactory to the Company that the Permitted Transferee will be bound by, and will be a party to, this Agreement. A Permitted Transferee to whom rights are transferred pursuant to this Section 4.2 may not again transfer those rights to any other Permitted Transferee, other than as provided in this Section 4.2. The Company may not assign its rights (except by merger or in connection with another entity acquiring all or substantially all of the Company's assets) or obligations hereunder without the prior written consent of all the Holders of the then outstanding Registrable Securities.

Governing Law. This Agreement and all claims or causes of action (whether in tort, contract or otherwise) that may be based upon, arise out of or relate to this Agreement or the negotiation, execution or performance of this Agreement (including any claim or cause of action based upon, arising out of or related to any representation or warranty made in or in connection with this Agreement) shall be governed by and construed in accordance with the Laws of the State of New York, without giving effect to any choice or conflict of law provision or rule (whether of the State of New York or any other jurisdiction) that would cause the application of the Laws of any jurisdiction other than the State of York.

Counterparts. This Agreement may be executed in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Counterparts may be delivered via facsimile, electronic mail or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

Titles and Subtitles. The titles and subtitles used in this Agreement are used for convenience only and are not to be considered in construing or interpreting this Agreement.

Notices. All notices and other communications given or made pursuant to this Agreement shall be in writing and shall be deemed effectively given upon the earlier of actual receipt, or (a) personal delivery to the party to be notified, (b) when sent, if sent by electronic mail during normal

business hours of the recipient, and if not sent during normal business hours, then on the recipient's next Business Day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) Business Day after deposit with a nationally recognized overnight courier, freight prepaid, specifying next Business Day delivery, with written verification of receipt. All communications shall be sent to the respective parties at their address as set forth on the signature page, or to such e-mail address or address as subsequently modified by written notice given in accordance with this 0.

Waiver. Waiver by the Company or the Purchaser of a breach hereunder by the Purchaser or the Company, respectively, shall not be construed as a waiver of any subsequent breach of the same or any other provision. No delay or omission by a party in exercising or availing itself of any right, power or privilege hereunder shall preclude the later exercise of any such right, power or privilege by such party. No waiver shall be effective unless made in writing with specific reference to the relevant provision(s) of this Agreement and signed by a duly authorized representative of the party granting the waiver. All remedies, either under this Agreement or by law or otherwise afforded to any party, shall be cumulative and not alternative.

Amendments. Any term of this Agreement may be amended or terminated only with the written consent of the Company and the Purchaser.

Severability. The invalidity or unenforceability of any provision hereof shall in no way affect the validity or enforceability of any other provision.

Entire Agreement. This Agreement and the Purchase Agreement constitute the full and entire understanding and agreement between the parties with respect to the subject matter hereof and thereof, and any other written or oral agreement relating to the subject matter hereof or thereof existing among the parties are expressly canceled.

Specific Enforcement. The parties hereto agree that irreparable damage would occur in the event that any of the provisions of this Agreement were not performed in accordance with their specific intent or were otherwise breached. It is accordingly agreed that the parties shall be entitled to an injunction or injunctions to prevent or cure breaches of the provisions of this Agreement and to enforce specifically the terms and provisions hereof, in addition to any other remedy to which they may be entitled by law or equity.

Exclusive Jurisdiction; Venue. Each of the parties hereto irrevocably agrees that any legal action or proceeding with respect to this Agreement and the rights and obligations arising hereunder, or for recognition and enforcement of any judgment in respect of this Agreement and the rights and obligations arising hereunder brought by another party hereto or its successors or assigns, shall be brought and determined exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan and agrees that it will not bring any action relating to this Agreement or any of the transactions contemplated by this Agreement in any court other than the aforesaid courts. Each of the parties hereto hereby irrevocably waives, and agrees not to assert as a defense, counterclaim or otherwise, in any action or proceeding with respect to this Agreement, (a) any claim that it is not personally subject to the jurisdiction of the above named courts for any reason other than the failure to serve in accordance

with this 0, (b) any claim that it or its property is exempt or immune from the jurisdiction of any such court or from any legal process commenced in such courts (whether through service of notice, attachment prior to judgment, attachment in aid of execution of judgment, execution of judgment or otherwise) and (c) to the fullest extent permitted by the applicable Law, any claim that (i) the suit, action or proceeding in such court is brought in an inconvenient forum, (ii) the venue of such suit, action or proceeding is improper or (iii) this Agreement, or the subject matter hereof, may not be enforced in or by such courts. Each of the parties hereto agrees that service of process upon such party in any such action or proceeding shall be effective if such process is given as a notice in accordance with 0.

Waiver of Jury Trial. EACH OF THE PARTIES TO THIS AGREEMENT HEREBY IRREVOCABLY WAIVES TO THE EXTENT PERMITTED BY APPLICABLE LAW ANY AND ALL RIGHT TO A TRIAL BY JURY IN ANY DIRECT OR INDIRECT ACTION, PROCEEDING OR COUNTERCLAIM ARISING OUT OF OR RELATING TO THIS AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY. EACH PARTY (A) CERTIFIES THAT NO REPRESENTATIVE, AGENT OR ATTORNEY OF ANY OTHER PARTY HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PARTY WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE THE FOREGOING WAIVER, (B) MAKES THIS WAIVER VOLUNTARILY, AND (C) ACKNOWLEDGES THAT EACH PARTY HAS BEEN INDUCED TO ENTER INTO THIS AGREEMENT BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS CONTAINED IN THIS 0.

Independent Nature of Holders' Obligations and Rights. The obligations of each Holder hereunder are several and not joint with the obligations of any other Holder hereunder, and no Holder shall be responsible in any way for the performance of the obligations of any other Holder hereunder. Nothing contained herein or in any other agreement or document delivered at any closing, and no action taken by any Holder pursuant hereto or thereto, shall be deemed to constitute the Holders as a partnership, an association, a joint venture or any other kind of group or entity, or create a presumption that the Holders are in any way acting in concert or as a group or entity with respect to such obligations or the transactions contemplated by this Agreement or any other matters, and the Company acknowledges that the Holders are not acting in concert or as a group, and the Company shall not assert any such claim, with respect to such obligations or transactions. Each Holder shall be entitled to protect and enforce its rights, including the rights arising out of this Agreement, and it shall not be necessary for any other Holder to be joined as an additional party in any proceeding for such purpose. The use of a single agreement with respect to the obligations of the Company contained herein was solely in the control of the Company, not the action or decision of any Holder, and was done solely for the convenience of the Company and not because it was required or requested to do so by any Holder. It is expressly understood and agreed that each provision contained in this Agreement is between the Company and a Holder, solely, and not between the Company and the Holders collectively and not between and among Holders.

[Signature pages follow]

IN WITNESS WHEREOF, each of the undersigned has duly executed this Agreement as of the date first above written.

Company: ARROWHEAD PHARMACEUTICALS, INC.

By: _____
Name:
Title:

Purchaser: SAREPTA THERAPEUTICS INVESTMENTS, INC.

By: _____
Name:
Title:

REGISTRATION RIGHTS AGREEMENT

This Registration Rights Agreement (this "**Agreement**") is made and entered into as of [●], 2024, by and between Arrowhead Pharmaceuticals, Inc., a Delaware corporation (the "**Company**"), and Avoro Life Sciences Fund LLC, a Delaware limited liability company (the "**Purchaser**").

NOW, THEREFORE, IN CONSIDERATION of the mutual covenants contained in this Agreement, and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the Company and the Purchaser agree as follows:

ARTICLE I

DEFINITIONS

Section 1.1. Definitions. As used in this Agreement, the following terms shall have the following meanings:

(a) "**Adverse Disclosure**" means public disclosure of material non-public information that, in the good faith judgment of the board of directors of the Company: (i) would be required to be made in such Registration Statement filed with the SEC by the Company so that such Registration Statement, from and after its effective date, does not contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading; (ii) would not be required to be made at such time but for the filing, effectiveness or continued use of such Registration Statement; and (iii) the Company has a bona fide business purpose for not disclosing publicly.

(b) "**Affiliate**" means, with respect to any Person, another Person that controls, is controlled by or is under common control with such Person; *provided*, that with respect to the Purchaser, the term "Affiliate" shall not include any employee benefit plan of Purchaser. A Person shall be deemed to control another Person if such Person possesses, directly or indirectly, the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of voting securities, by contract or otherwise. For the purposes of this Agreement, in no event shall the Purchaser or any of its Affiliates be deemed Affiliates of the Company or any of its Affiliates, nor shall the Company or any of its Affiliates be deemed Affiliates of the Purchaser or any of its Affiliates.

(c) "**Agreement**" has the meaning set forth in the preamble.

(d) "**Business Day**" means any day except Saturday, Sunday and any legal holiday or a day on which banking institutions in Pasadena, California generally are authorized or required by law or other governmental actions to close.

(e) "**Closing**" means the date of the purchase and sale of the Shares and the Pre-Funded Warrant pursuant to the Purchase Agreement.

(f) "**Common Stock**" means the common stock of the Company, par value $0.001 per share.

(g) "**Company Indemnitee**" has the meaning set forth in Section 2.8.

(h) "**Effectiveness Period**" has the meaning set forth in Section 2.1.3.

(i) "**Exchange Act**" means the Securities Exchange Act of 1934, as amended, as in effect from time to time.

(j) "**Filing Deadline**" has the meaning set forth in Section 2.1.1.

(k) "**FINRA**" means the Financial Industry Regulatory Authority.

(l) "**Holder**" or "**Holders**" means the Purchaser, or such other holder or holders, as the case may be, from time to time of Registrable Securities.

(m) "**Initial Registration Statement**" has the meaning set forth in Section 2.1.1(a).

(n) "**Issuer Free Writing Prospectus**" means an issuer free writing prospectus, as defined in Rule 433 under the Securities Act, relating to an offer of the Registrable Securities.

(o) "**Laws**" mean all United States and foreign national, federal, state, and local laws, statutes, ordinances, rules, regulations, orders, treaties and decrees.

(p) "**Loss**" has the meaning set forth in Section 2.7.1.

(q) "**New Registration Statement**" has the meaning set forth in Section 2.1.1.

(r) "**Permitted Transferee**" means any Affiliate of the Purchaser.

(s) "**Person**" means any individual, firm, corporation, limited liability company, partnership, company or other entity, and shall include any successor (by merger or otherwise) of such entity.

(t) "**Pre-Funded Warrant**" means the pre-funded warrant to purchase Common Stock issued to the Purchaser pursuant to the Purchase Agreement.

(u) "**Prospectus**" means (i) the prospectus included in any Registration Statement, all amendments and supplements to such prospectus, including post-effective amendments and supplements, and all other material incorporated by reference in such prospectus, and (ii) any Issuer Free Writing Prospectus.

(v) "**Public Offering**" means the offer and sale of Registrable Securities for cash pursuant to an effective registration statement under the Securities Act (other than a registration statement on Form S-4 or Form S-8 or any successor form).

(w) "**Purchase Agreement**" means the Securities Purchase Agreement, by and between the Company and the Purchaser, dated as of November [25], 2024.

(x) "**Purchaser**" has the meaning set forth in the preamble.

(y) "**Registrable Securities**" means all of (i) the Shares, (ii) the Warrant Shares, and (iii) any securities issued or issuable upon any stock split, dividend or other distribution, recapitalization or similar event with respect to the foregoing, *provided*, that with respect to a particular Holder, such Holder's Shares and Warrant Shares shall cease to be Registrable Securities upon a sale pursuant to a Registration Statement or Rule 144 under the Securities Act (in which case, only such security sold by the Holder shall cease to be a Registrable Security).

(z) "**Registration**" means registration under the Securities Act of the offer and sale to the public of any Registrable Securities under a Registration Statement. The terms "**register**", "**registered**" and "**registering**" shall have correlative meanings.

(aa) "**Registration Expenses**" has the meaning set forth in Section 2.6.

(bb) "**Registration Statement**" or "**Registration Statements**" means any one or more registration statements of the Company filed under the Securities Act that covers the resale of any of the Registrable Securities pursuant to the provisions of this Agreement (including the Initial Registration Statement, the New Registration Statement and, if applicable, any Additional Registration Statement), amendments and supplements to such Registration Statements, including post-effective amendments, all exhibits and all material incorporated by reference or deemed to be incorporated by reference in such Registration Statements.

(cc) "**Representatives**" means, with respect to any Person, any of such Person's officers, directors, employees, agents, attorneys, accountants, actuaries, consultants, equity financing partners or financial advisors or other Person associated with, or acting on behalf of, such Person.

(dd) "**Rule 144**" means Rule 144 under the Securities Act (or any successor rule).

(ee) "**SEC**" means the Securities and Exchange Commission.

(ff) "**Securities Act**" means the Securities Act of 1933, as amended.

(gg) "**Selling Stockholder Information**" has the meaning set forth in Section 2.7.1.

(hh) "**Shares**" means the shares of Common Stock issued or issuable to the Purchaser pursuant to the Purchase Agreement.

(ii) "**Shelf Takedown Request**" has the meaning set forth in Section 2.1.4(a).

(jj) "**Suspension**" has the meaning set forth in Section 2.1.3.

(kk) "**Transfer**" means, with respect to any Registrable Security, any interest therein, or any other securities or equity interests relating thereto, a direct or indirect transfer, sale, exchange, assignment, pledge, hypothecation or other encumbrance or other disposition thereof, including the grant of an option or other right, whether directly or indirectly, whether voluntarily,

involuntarily, by operation of law, pursuant to judicial process or otherwise. "**Transferred**" shall have a correlative meaning.

(ll) "**Underwritten Public Offering**" means an underwritten Public Offering, including any bought deal or block sale to a financial institution conducted as an underwritten Public Offering.

(mm) "**Underwritten Shelf Takedown**" means an Underwritten Public Offering pursuant to the Initial Registration Statement or a New Registration Statement.

(nn) "**Warrant Shares**" means the shares of Common Stock issued or issuable upon exercise of a Pre-Funded Warrant.

Section 1.2. Construction. Whenever required by the context, any pronoun used in this Agreement shall include the corresponding masculine, feminine or neuter forms, and the singular forms of nouns, pronouns, and verbs shall include the plural and vice versa. Reference to any agreement, document, or instrument means such agreement, document, or instrument as amended or otherwise modified from time to time in accordance with the terms thereof and, if applicable, hereof. A reference to any party hereto includes such party's permitted assignees and/or the respective successors in title to substantially the whole of such party's undertaking. All references to "Sections" contained in this Agreement are, unless specifically indicated otherwise, references to sections, schedules, or exhibits of or to this Agreement. The recitals, schedules and exhibits to this Agreement form part of the operative provisions of this Agreement and references to this Agreement shall, unless the context otherwise requires, include references to the recitals to this Agreement. As used in this Agreement, the following terms shall have the meanings indicated: (a) "day" means a calendar day; (b) "U.S." or "United States" means the United States of America; (c) "dollar" or "$" means lawful currency of the United States; (d) "including" or "include" means "including without limitation"; and (e) references in this Agreement to specific laws includes the succeeding law, section, or provision corresponding thereto and the rules and regulations promulgated thereunder.

ARTICLE II

REGISTRATION RIGHTS

The Company will perform and comply, and cause each of its subsidiaries to perform and comply, with such of the following provisions as are applicable to it. Each Holder will perform and comply with such of the following provisions as are applicable to such Holder.

Section 2.1. Registration.

Section 2.1.1. Request for Registration.

(a) As promptly as possible, and in any event within thirty (30) calendar days of the Closing (the "**Filing Deadline**"), the Company shall file with the SEC a shelf Registration Statement pursuant to Rule 415 under the Securities Act or, if Rule 415 is not available for offers and sales of the Registrable Securities, by such other means of distribution of Registrable Securities as the Holders may reasonably specify (the "**Initial Registration Statement**"), relating

to the offer and sale of Registrable Securities by any Holders thereof from time to time in accordance with the methods of distribution elected by such Holders, and the Company shall use its reasonable best efforts to cause the Initial Registration Statement to promptly become effective under the Securities Act, *provided*, *however*, that the Company shall be permitted to file a post-effective amendment or Prospectus supplement to any effective shelf Registration Statement in lieu of filing a new Registration Statement to the extent the Company determines, and the Holders agree, that the Registrable Securities may be sold thereunder by the Holders pursuant to their intended plan of distribution.

(b) Notwithstanding the registration obligations set forth in this Section 2.1.1, in the event the SEC informs the Company that all of the Registrable Securities cannot, as a result of the application of Rule 415, be registered for resale as a secondary offering on a single registration statement, the Company agrees to promptly (i) inform each of the Holders thereof and use its commercially reasonable efforts to file amendments to the Initial Registration Statement as required by the SEC and/or (ii) withdraw the Initial Registration Statement and file a new registration statement (a "**New Registration Statement**"), in either case covering the maximum number of Registrable Securities permitted to be registered by the SEC, on Form S-3 or such other form available to register for resale the Registrable Securities as a secondary offering; *provided, however*, that prior to filing such amendment or New Registration Statement, the Company shall be obligated to use its commercially reasonable efforts to advocate with the SEC for the registration of all of the Registrable Securities. Notwithstanding any other provision of this Agreement, if the SEC limits the number of Registrable Securities permitted to be registered on a particular Registration Statement as a secondary offering (and notwithstanding that the Company used diligent efforts to advocate with the SEC for the registration of all or a greater number of Registrable Securities), unless otherwise directed in writing by a Holder as to its Registrable Securities, the number of Registrable Securities to be registered on such Registration Statement will be reduced: first by Registrable Securities not acquired pursuant to the Purchase Agreement (whether pursuant to registration rights or otherwise); second by Registrable Securities represented by the Pre-Funded Warrant; and third by Registrable Securities represented by Shares. In the event the Company amends the Initial Registration Statement or files a New Registration Statement, as the case may be, under clauses (i) or (ii) above, the Company will use its commercially reasonable efforts to file with the SEC, as promptly as allowed by SEC, one or more registration statements on Form S-3 or such other form available to register for resale those Registrable Securities that were not registered for resale on the Initial Registration Statement, as amended, or the New Registration Statement.

Section 2.1.2. Continued Effectiveness. The Company shall use its reasonable best efforts to keep such Registration Statement continuously effective under the Securities Act in order to permit the Prospectus forming part of the Registration Statement to be usable by Holders until the date as of which no Holder holds Registrable Securities (such period of effectiveness, the "**Effectiveness Period**"). Subject to Section 2.1.3, the Company shall be deemed not to have used its reasonable best efforts to keep the Registration Statement effective during the Effectiveness Period if the Company voluntarily takes any action or omits to take any action that would result in Holders of the Registrable Securities covered thereby not being able to offer and sell any Registrable Securities pursuant to such Registration Statement during the Effectiveness Period, unless such action or omission is required by applicable law.

Section 2.1.3. Suspension of Registration. If the continued use of such Registration Statement at any time would require the Company to make an Adverse Disclosure, the Company may, upon giving prompt written notice of such action to the Holders (provided that in no event shall such notice contain any material, nonpublic information), suspend use of the Registration Statement (a "**Suspension**"); *provided, however*, that the Company shall not be permitted to exercise a Suspension more than one time during any twelve (12)-month period for a period not to exceed sixty (60) days. In the case of a Suspension, the Holders agree to suspend use of the applicable Prospectus in connection with any sale or purchase of, or offer to sell or purchase, Registrable Securities, upon receipt of the notice referred to above. The Company shall immediately notify the Holders in writing upon the termination of any Suspension (provided that in no event shall such notice contain any material, nonpublic information), amend or supplement the Prospectus, if necessary, so it does not contain any untrue statement or omission and furnish to the Holders such numbers of copies of the Prospectus as so amended or supplemented as the Holders may reasonably request. The Company shall, if necessary, supplement or amend the Registration Statement, if required by the registration form used by the Company for the Registration Statement or by the instructions applicable to such registration form or by the Securities Act or the rules or regulations promulgated thereunder or as may reasonably be requested by the Holders of a majority of Registrable Securities that are included in such Registration Statement.

Section 2.1.4. Shelf Takedown. During the Effectiveness Period, by notice to the Company specifying the intended method or methods of disposition thereof, the Purchaser may make a written request (a "**Shelf Takedown Request**") to the Company to effect a Public Offering, including an Underwritten Shelf Takedown, of all or a portion of the Registrable Securities that may be registered under such Registration Statement, and as soon as practicable the Company shall amend or supplement the Registration Statement as necessary for such purpose.

Section 2.1.5. Statutory Underwriters. Notwithstanding anything to the contrary contained herein, in no event shall the Company be permitted to name any Holder or affiliate of a Holder as an underwriter without the prior written consent of such Holder. In no event shall any Holder be identified as a statutory underwriter in any Registration Statement; *provided, however*, that if the Commission requests that a Holder be identified as a statutory underwriter in the Registration Statement, such Holder will have an opportunity to withdraw from the Registration Statement.

Section 2.2. Registration Procedures.

Section 2.2.1. Requirements. In connection with the Company's obligations under Section 2.1, the Company shall use its reasonable best efforts to effect such Registration and to permit the sale of such Registrable Securities in accordance with the intended method or methods of distribution thereof as expeditiously as reasonably practicable, and in connection therewith the Company shall:

(a) Before filing a Registration Statement or Prospectus or any amendments or supplements thereto, (x) furnish to the underwriters, if any, and to the Holders of the Registrable Securities covered by such Registration Statement, copies of all documents prepared to be filed, which documents shall be subject to the review of such underwriters and such Holders and their

respective counsel and (y) make such changes in such documents concerning the Holders prior to the filing thereof as such Holders, or their counsel, may reasonably request;

(b) prepare and file with the SEC such amendments and post-effective amendments to such Registration Statement and supplements to the Prospectus as may be (x) reasonably requested by any Holder with Registrable Securities covered by such Registration Statement, (y) reasonably requested by any participating Holder (to the extent such request relates to information relating to such Holder), or (z) necessary to keep such Registration Statement effective during the Effectiveness Period, and comply with provisions of the applicable securities laws with respect to the sale or other disposition of all securities covered by such Registration Statement during such period in accordance with the intended method or methods of disposition by the sellers thereof set forth in such Registration Statement;

(c) notify the participating Holders and the managing underwriter or underwriters, if any, and (if requested) confirm such notice in writing and provide copies of the relevant documents, as soon as reasonably practicable after notice thereof is received by the Company (a) when the applicable Registration Statement or any amendment thereto has been filed or becomes effective, and when the applicable Prospectus or any amendment or supplement thereto has been filed, (b) of any written comments by the SEC, or any request by the SEC or other federal or state governmental authority for amendments or supplements to such Registration Statement or such Prospectus, or for additional information (whether before or after the effective date of the Registration Statement) or any other correspondence with the SEC relating to, or which may affect, the Registration, (c) of the issuance by the SEC of any stop order suspending the effectiveness of such Registration Statement or any order by the SEC or any other regulatory authority preventing or suspending the use of any preliminary or final Prospectus or the initiation or threatening of any proceedings for such purposes, (d) if, at any time, the representations and warranties of the Company in any applicable underwriting agreement cease to be true and correct in all material respects and (e) of the receipt by the Company of any notification with respect to the suspension of the qualification of the Registrable Securities for offering or sale in any jurisdiction or the initiation or threatening of any proceeding for such purpose;

(d) promptly notify each selling Holder and the managing underwriter or underwriters, if any, when the Company becomes aware of the happening of any event as a result of which the applicable Registration Statement or the Prospectus included in such Registration Statement contains any untrue statement of a material fact or omits to state a material fact necessary to make the statements therein (in the case of such Prospectus or any preliminary Prospectus, in light of the circumstances under which they were made) not misleading, when any Issuer Free Writing Prospectus includes information that may conflict with the information contained in the Registration Statement, or, if for any other reason it shall be necessary during such time period to amend or supplement such Registration Statement or Prospectus in order to comply with the Securities Act and, as promptly as reasonably practicable thereafter, prepare and file with the SEC, and furnish without charge to the selling Holders and the managing underwriter or underwriters, if any, an amendment or supplement to such Registration Statement or Prospectus, which shall correct such misstatement or omission or effect such compliance;

(e) to the extent the Company is eligible under the relevant provisions of Rule 430B under the Securities Act, the Company shall include in the applicable Registration Statement

such disclosures as may be required by Rule 430B under the Securities Act (referring to the unnamed selling security holders in a generic manner by identifying the initial offering of the securities to the Holders) in order to ensure that the Holders may be added to such Registration Statement at a later time through the filing of a Prospectus supplement rather than a post-effective amendment;

(f) use its reasonable best efforts to prevent, or obtain the withdrawal of, any stop order or other order or notice preventing or suspending the use of any preliminary or final Prospectus;

(g) promptly incorporate in a Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment such information as the managing underwriter or underwriters and the Purchaser agree should be included therein relating to the plan of distribution with respect to such Registrable Securities; and make all required filings of such Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment as soon as reasonably practicable after being notified of the matters to be incorporated in such Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment;

(h) furnish to each selling Holder and each underwriter, if any, without charge, as many conformed copies as such Holder or underwriter may reasonably request of the applicable Registration Statement and any amendment or post-effective amendment or supplement thereto, including financial statements and schedules, all documents incorporated therein by reference and all exhibits (including those incorporated by reference);

(i) deliver to each selling Holder and each underwriter, if any, without charge, as many copies of the applicable Prospectus (including each preliminary Prospectus) and any amendment or supplement thereto and such other documents as such Holder or underwriter may reasonably request in order to facilitate the disposition of the Registrable Securities by such Holder or underwriter (it being understood that the Company shall consent to the use of such Prospectus or any amendment or supplement thereto by each of the selling Holders and the underwriters, if any, in connection with the offering and sale of the Registrable Securities covered by such Prospectus or any amendment or supplement thereto);

(j) on or prior to the date on which the applicable Registration Statement becomes effective, use its reasonable best efforts to register or qualify in connection with the Registration or qualification of such Registrable Securities for offer and sale under the securities or "Blue Sky" laws of each state and other jurisdiction as any such selling Holder or managing underwriter or underwriters, if any, or their respective counsel reasonably request in writing and do any and all other acts or things reasonably necessary or advisable to keep such Registration or qualification in effect for the Effectiveness Period, *provided* that the Company shall not be required to qualify generally to do business in any jurisdiction where it is not then so qualified or to take any action which would subject it to taxation or general service of process in any such jurisdiction where it is not then so subject;

(k) cooperate with the selling Holders and the managing underwriter or underwriters, if any, to facilitate the timely preparation and delivery of certificates representing Registrable Securities to be sold and not bearing any restrictive legends and enable such

Registrable Securities to be in such denominations and registered in such names as the managing underwriters may request prior to any sale of Registrable Securities to the underwriters;

(l) use its reasonable best efforts to cause the Registrable Securities covered by the applicable Registration Statement to be registered with or approved by such other governmental agencies or authorities as may be necessary to enable the seller or sellers thereof or the underwriter or underwriters, if any, to consummate the disposition of such Registrable Securities;

(m) make such representations and warranties to the Holders being registered, and the underwriters or agents, if any, in form, substance and scope as are customarily made by issuers in public offerings similar to the offering then being undertaken;

(n) enter into such customary agreements (including underwriting and indemnification agreements) and take all such other actions as the Purchaser or the managing underwriter or underwriters, if any, reasonably request in order to expedite or facilitate the Registration and disposition of such Registrable Securities;

(o) obtain for delivery to the Holders and to the underwriter or underwriters, if any, an opinion or opinions from counsel for the Company dated the most recent effective date of the Registration Statement or, in the event of an Underwritten Public Offering, the date of the closing under the underwriting agreement, in customary form, scope and substance, which opinions shall be reasonably satisfactory to such Holders or underwriters, as the case may be, and their respective counsel;

(p) in the case of an Underwritten Public Offering, obtain for delivery to the Company and the managing underwriter or underwriters, with copies to the Holders included in such Registration or sale, a comfort letter from the Company's independent certified public accountants or independent auditors (and, if necessary, any other independent certified public accountants or independent auditors of any subsidiary of the Company or any business acquired by the Company for which financial statements and financial data are, or are required to be, included in the Registration Statement) in customary form and covering such matters of the type customarily covered by comfort letters as the managing underwriter or underwriters reasonably request, dated the date of execution of the underwriting agreement and brought down to the closing under the underwriting agreement;

(q) cooperate with each seller of Registrable Securities and each underwriter, if any, participating in the disposition of such Registrable Securities and their respective counsel in connection with any filings required to be made with FINRA;

(r) provide and cause to be maintained a transfer agent and registrar for all Registrable Securities covered by the applicable Registration Statement;

(s) use its reasonable best efforts to cause all Registrable Securities covered by the applicable Registration Statement to be listed on each securities exchange on which any of the Company's equity securities are then listed or quoted and on each inter-dealer quotation system on which any of the Company's equity securities are then quoted;

(t) make available upon reasonable notice at reasonable times and for reasonable periods for inspection by the Purchaser, by any underwriter participating in any disposition to be effected pursuant to such Registration Statement and by any attorney, accountant or other agent retained by the Purchaser or any such underwriter, all pertinent financial and other records and pertinent corporate documents and properties of the Company, and cause all of the Company's officers, directors and employees and the independent public accountants who have certified its financial statements to make themselves available to discuss the business of the Company and to supply all information reasonably requested by any such Person in connection with such Registration Statement;

(u) in the case of an Underwritten Public Offering, cause the senior executive officers of the Company to participate in the customary "road show" presentations that may be reasonably requested by the managing underwriter or underwriters in any such offering and otherwise to facilitate, cooperate with, and participate in each proposed offering contemplated herein and customary selling efforts related thereto;

(v) take no direct or indirect action prohibited by Regulation M under the Exchange Act;

(w) take all reasonable action to ensure that any Issuer Free Writing Prospectus utilized in connection with any Registration complies in all material respects with the Securities Act, is filed in accordance with the Securities Act to the extent required thereby, is retained in accordance with the Securities Act to the extent required thereby and, when taken together with the related Prospectus, will not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements therein, in light of the circumstances under which they were made, not misleading; and

(x) take all such other commercially reasonable actions as are necessary or advisable in order to expedite or facilitate the disposition of such Registrable Securities in accordance with the terms of this Agreement.

Section 2.2.2. Company Information Requests. The Company may require each seller of Registrable Securities as to which any Registration or sale is being effected to furnish to the Company such information regarding the distribution of such securities and such other information relating to such Holder and its ownership of Registrable Securities as the Company may from time to time reasonably request in writing. Each Holder agrees to furnish such information to the Company and to cooperate with the Company as reasonably necessary to enable the Company to comply with the provisions of this Agreement.

Section 2.2.3. Discontinuing Registration. Each Holder agrees that, upon receipt of any notice from the Company of the happening of any event of the kind described in Section 2.2.1(d), such Holder will discontinue disposition of Registrable Securities pursuant to such Registration Statement until such Holder's receipt of the copies of the supplemented or amended Prospectus contemplated by Section 2.2.1(d), or until such Holder is advised in writing by the Company that the use of the Prospectus may be resumed, and has received copies of any additional or supplemental filings that are incorporated by reference in the Prospectus, or any amendments or supplements thereto, and if so directed by the Company, such Holder shall deliver to the

Company (at the Company's expense) all copies, other than permanent file copies then in such Holder's possession, of the Prospectus covering such Registrable Securities current at the time of receipt of such notice.

Section 2.3. Underwritten Offerings.

Section 2.3.1. Shelf Registrations. If requested by the underwriters for any Underwritten Shelf Takedown, pursuant to a Registration or sale under Section 2.1, the Company shall enter into an underwriting agreement with such underwriters, such agreement to be reasonably satisfactory in substance and form to each of the Company, the Purchaser and the underwriters, and to contain such representations and warranties by the Company and such other terms as are generally prevailing in agreements of that type, including indemnities no less favorable to the recipient thereof than those provided in Section 2.6 of this Agreement. The Holders of the Registrable Securities proposed to be distributed by such underwriters shall cooperate with the Company in the negotiation of the underwriting agreement and shall give consideration to the reasonable suggestions of the Company regarding the form thereof, and such Holders shall complete and execute all questionnaires, powers of attorney and other documents reasonably requested by the underwriters and required under the terms of such underwriting arrangements. Any such Holder shall not be required to make any representations or warranties to or agreements with the Company or the underwriters other than representations, warranties or agreements regarding such Holder, such Holder's title to the Registrable Securities, such Holder's intended method of distribution and any other representations to be made by the Holder as are generally prevailing in agreements of that type, and the aggregate amount of the liability of such Holder under such agreement shall not exceed such Holder's proceeds from the sale of its Registrable Securities in the offering, net of underwriting discounts and commissions but before expenses.

Section 2.3.2. Selection of Underwriters; Selection of Counsel. In the case of an Underwritten Shelf Takedown under Section 2.1, the managing underwriter or underwriters to administer the offering shall be determined by the Purchaser and counsel to the Holders shall be mutually agreed upon by the Company and the Purchaser.

Section 2.4. No Inconsistent Agreements; Additional Rights. Neither the Company nor any of its subsidiaries shall hereafter enter into, and neither the Company nor any of its subsidiaries is currently a party to, any agreement with respect to its securities that is inconsistent with the rights granted to the Holders by this Agreement. The Company hereby represents and warrants that, as of the date hereof, no registration or similar rights have been granted to any other Person other than pursuant to this Agreement.

Section 2.5. Registration Expenses. All expenses incident to the Company's performance of or compliance with this Agreement shall be paid by the Company, including (i) all registration and filing fees, and any other fees and expenses associated with filings required to be made with the SEC or FINRA, (ii) all fees and expenses in connection with compliance with any securities or "Blue Sky" laws (including reasonable fees and disbursements of counsel for the underwriters in connection with blue sky qualifications of the Registrable Securities), (iii) all printing, duplicating, word processing, messenger, telephone, facsimile and delivery expenses (including expenses of printing certificates for the Registrable Securities in a form eligible for

deposit with The Depository Trust Company and of printing Prospectuses), (iv) all fees and disbursements of counsel for the Company and of all independent certified public accountants or independent auditors of the Company and any subsidiaries of the Company (including the expenses of any special audit and comfort letters required by or incident to such performance), (v) Securities Act liability insurance or similar insurance if the Company so desires or the underwriters so require in accordance with then-customary underwriting practice, (vi) all fees and expenses incurred in connection with the listing of the Registrable Securities on any securities exchange or quotation of the Registrable Securities on any inter-dealer quotation system, (viii) all reasonable fees and disbursements of one legal counsel for the selling Holders, (ix) any reasonable fees and disbursements of underwriters customarily paid by issuers or sellers of securities, (x) all fees and expenses incurred in connection with the distribution or Transfer of Registrable Securities to or by a Holder or its Permitted Transferees in connection with a Public Offering, (xi) all fees and expenses of any special experts or other Persons retained by the Company in connection with any Registration or sale, (xii) all of the Company's internal expenses (including all salaries and expenses of its officers and employees performing legal or accounting duties) and (xiii) all expenses related to the "road show" for any Underwritten Public Offering, including the reasonable out-of-pocket expenses of the Holders and underwriters, if so requested. All such expenses are referred to herein as "**Registration Expenses**". The Company shall not be required to pay any fees and disbursements to underwriters not customarily paid by the issuers of securities in an offering similar to the applicable offering, including underwriting discounts and commissions and transfer taxes, if any, attributable to the sale of Registrable Securities.

Section 2.6. Indemnification.

Section 2.6.1. Indemnification by the Company. The Company shall indemnify and hold harmless, to the full extent permitted by law, each Holder, each shareholder, member, limited or general partner of such Holder, each shareholder, member, limited or general partner of each such shareholder, member, limited or general partner, each of their respective Affiliates, officers, directors, shareholders, employees, advisors, and agents and each Person who controls (within the meaning of the Securities Act or the Exchange Act) such Persons and each of their respective Representatives from and against any and all losses, penalties, judgments, suits, costs, claims, damages, liabilities and expenses, joint or several (including reasonable costs of investigation and legal expenses and any indemnity and contribution payments made to underwriters) (each, a "**Loss**" and collectively "**Losses**") arising out of or based upon (i) any untrue or alleged untrue statement of a material fact contained in any Registration Statement under which such Registrable Securities are registered or sold under the Securities Act (including any final, preliminary or summary Prospectus contained therein or any amendment thereof or supplement thereto or any documents incorporated by reference therein) or any other disclosure document produced by or on behalf of the Company or any of its subsidiaries including any report and other document filed under the Exchange Act, (ii) any omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein (in the case of a Prospectus or preliminary Prospectus, in light of the circumstances under which they were made) not misleading or (iii) any violation or alleged violation by the Company or any of its subsidiaries of any federal, state, foreign or common law rule or regulation applicable to the Company or any of its subsidiaries and relating to action or inaction in connection with any such registration, disclosure document or other document or report; *provided*, that no selling Holder shall be entitled to indemnification pursuant to this Section 2.6.1 in respect of any untrue statement

or omission contained in any information relating to such seller Holder furnished in writing by such selling Holder to the Company specifically for inclusion in a Registration Statement and used by the Company in conformity therewith (such information "**Selling Stockholder Information**"). This indemnity shall be in addition to any liability the Company may otherwise have. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of such Holder or any indemnified party and shall survive the Transfer of such securities by such Holder and regardless of any indemnity agreed to in the underwriting agreement that is less favorable to the Holders. The Company shall also indemnify underwriters, selling brokers, dealer managers and similar securities industry professionals participating in the distribution, their officers and directors and each Person who controls such Persons (within the meaning of the Securities Act and the Exchange Act) to the same extent as provided above (with appropriate modification) with respect to the indemnification of the indemnified parties.

Section 2.6.2. Indemnification by the Selling Holders. Each selling Holder agrees (severally and not jointly) to indemnify and hold harmless, to the fullest extent permitted by law, the Company, its directors and officers and each Person who controls the Company (within the meaning of the Securities Act or the Exchange Act) from and against any Losses resulting from (i) any untrue statement of a material fact in any Registration Statement under which such Registrable Securities were registered or sold under the Securities Act (including any final, preliminary or summary Prospectus contained therein or any amendment thereof or supplement thereto or any documents incorporated by reference therein) or (ii) any omission to state therein a material fact required to be stated therein or necessary to make the statements therein (in the case of a Prospectus or preliminary Prospectus, in light of the circumstances under which they were made) not misleading, in each case to the extent, but only to the extent, that such untrue statement or omission is contained in such selling Holder's Selling Stockholder Information. In no event shall the liability of any selling Holder hereunder be greater in amount than the dollar amount of the proceeds from the sale of its Registrable Securities in the offering giving rise to such indemnification obligation, net of underwriting discounts and commissions but before expenses, less any amounts paid by such Holder pursuant to Section 2.6.4 and any amounts paid by such Holder as a result of liabilities incurred under the underwriting agreement, if any, related to such sale.

Section 2.6.3. Conduct of Indemnification Proceedings. Any Person entitled to indemnification hereunder shall (i) give prompt written notice to the indemnifying party of any claim with respect to which it seeks indemnification (provided that any delay or failure to so notify the indemnifying party shall relieve the indemnifying party of its obligations hereunder only to the extent, if at all, that it forfeits substantive legal rights by reason of such delay or failure) and (ii) permit such indemnifying party to assume the defense of such claim with counsel reasonably satisfactory to the indemnified party; *provided, however*, that any Person entitled to indemnification hereunder shall have the right to select and employ separate counsel and to participate in the defense of such claim, but the fees and expenses of such counsel shall be at the expense of such Person unless (i) the indemnifying party has agreed in writing to pay such fees or expenses, (ii) the indemnifying party shall have failed to assume the defense of such claim within a reasonable time after receipt of notice of such claim from the Person entitled to indemnification hereunder and employ counsel reasonably satisfactory to such Person, (iii) the indemnified party has reasonably concluded (based upon advice of its counsel) that there may be legal defenses available to it or other indemnified parties that are different from or in addition to those available

to the indemnifying party, or (iv) in the reasonable judgment of any such Person (based upon advice of its counsel) a conflict of interest may exist between such Person and the indemnifying party with respect to such claims (in which case, if the Person notifies the indemnifying party in writing that such Person elects to employ separate counsel at the expense of the indemnifying party, the indemnifying party shall not have the right to assume the defense of such claim on behalf of such Person). If the indemnifying party assumes the defense, the indemnifying party shall not have the right to settle such action without the consent of the indemnified party. No indemnifying party shall consent to entry of any judgment or enter into any settlement which does not include as an unconditional term thereof the giving by the claimant or plaintiff to such indemnified party of an unconditional release from all liability in respect to such claim or litigation without the prior written consent of such indemnified party. If such defense is not assumed by the indemnifying party, the indemnifying party will not be subject to any liability for any settlement made without its prior written consent, but such consent may not be unreasonably withheld. It is understood that the indemnifying party or parties shall not, except as specifically set forth in this Section 2.6.3, in connection with any proceeding or related proceedings in the same jurisdiction, be liable for the reasonable fees, disbursements or other charges of more than one separate firm admitted to practice in such jurisdiction at any one time unless (x) the employment of more than one counsel has been authorized in writing by the indemnifying party or parties, (y) an indemnified party has reasonably concluded (based on the advice of counsel) that there may be legal defenses available to it that are different from or in addition to those available to the other indemnified parties or (z) a conflict or potential conflict exists or may exist (based upon advice of counsel to an indemnified party) between such indemnified party and the other indemnified parties, in each of which cases the indemnifying party shall be obligated to pay the reasonable fees and expenses of such additional counsel or counsels.

Section 2.6.4. Contribution. If for any reason the indemnification provided for in Section 2.6.1 and Section 2.6.2 is unavailable to an indemnified party or insufficient in respect of any Losses referred to therein (other than as a result of exceptions or limitations on indemnification contained in Section 2.6.1 and Section 2.6.2), then the indemnifying party shall contribute to the amount paid or payable by the indemnified party as a result of such Loss in such proportion as is appropriate to reflect the relative fault of the indemnifying party on the one hand and the indemnified party or parties on the other hand in connection with the acts, statements or omissions that resulted in such Losses, as well as any other relevant equitable considerations. In connection with any Registration Statement filed with the SEC by the Company, the relative fault of the indemnifying party on the one hand and the indemnified party on the other hand shall be determined by reference to, among other things, whether any untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the indemnifying party or by the indemnified party and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission. The parties hereto agree that it would not be just or equitable if contribution pursuant to this Section 2.6.4 were determined by pro rata allocation or by any other method of allocation that does not take account of the equitable considerations referred to in this Section 2.6.4. No Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation. The amount paid or payable by an indemnified party as a result of the Losses referred to in Sections 2.6.1 and 2.6.2 shall be deemed to include, subject to the limitations set forth above, any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or

defending any such action or claim. Notwithstanding the provisions of this Section 2.6.4, in connection with any Registration Statement filed by the Company, a selling Holder shall not be required to contribute any amount in excess of the dollar amount of the proceeds from the sale of its Registrable Securities in the offering giving rise to such indemnification obligation, net of underwriting discounts and commissions but before expenses, less any amounts paid by such Holder pursuant to Section 2.6.2 and any amounts paid by such Holder as a result of liabilities incurred under the underwriting agreement, if any, related to such sale. If indemnification is available under this Section 2.6, the indemnifying parties shall indemnify each indemnified party to the full extent provided in Sections 2.6.1 and 2.6.2 hereof without regard to the provisions of this Section 2.6.4. The remedies provided for in this Section 2.6 are not exclusive and shall not limit any rights or remedies which may otherwise be available to any indemnified party at law or in equity.

Section 2.7. Indemnification Priority. The Company hereby acknowledges and agrees that any of the Persons entitled to indemnification pursuant to Section 2.6.1 (each, a "**Company Indemnitee**" and collectively, the "**Company Indemnitees**") may have certain rights to indemnification, advancement of expenses and/or insurance provided by other sources. The Company hereby acknowledges and agrees (i) that it is the indemnitor of first resort (i.e., its obligations to a Company Indemnitee are primary and any obligation of such other sources to advance expenses or to provide indemnification for the same expenses or liabilities incurred by such Company Indemnitee are secondary) and (ii) that it shall be required to advance the full amount of expenses incurred by a Company Indemnitee and shall be liable for the full amount of all expenses, judgments, penalties, fines and amounts paid in settlement to the extent legally permitted and as required by the terms of this Agreement without regard to any rights a Company Indemnitee may have against such other sources. The Company further agrees that no advancement or payment by such other sources on behalf of a Company Indemnitee with respect to any claim for which such Company Indemnitee has sought indemnification, advancement of expenses or insurance from the Company shall affect the foregoing, and that such other sources shall have a right of contribution and/or be subrogated to the extent of such advancement or payment to all of the rights of recovery of such Company Indemnitee against the Company.

Section 2.8. Rules 144 and 144A and Regulation S. The Company shall file the reports required to be filed by it under the Securities Act and the Exchange Act and the rules and regulations adopted by the SEC thereunder (or, if the Company is not required to file such reports, it will, upon the request of any Holder, make publicly available such necessary information for so long as necessary to permit sales that would otherwise be permitted by this Agreement pursuant to Rule 144, Rule 144A or Regulation S under the Securities Act, as such rules may be amended from time to time or any similar rule or regulation hereafter adopted by the SEC), and it will take such further action as any Holder may reasonably request, all to the extent required from time to time to enable such Holder to sell Registrable Securities without Registration under the Securities Act in transactions that would otherwise be permitted by this Agreement and within the limitation of the exemptions provided by (i) Rule 144, Rule 144A or Regulation S under the Securities Act, as such rules may be amended from time to time, or (ii) any similar rule or regulation hereafter adopted by the SEC. Upon the request of any Holder, the Company will deliver to such Holder a written statement as to whether it has complied with such requirements and, if not, the specifics thereof.

Section 2.9. Existing Registration Statements. Notwithstanding anything herein to the contrary and subject to applicable law and regulation, the Company may satisfy any obligation hereunder to file a Registration Statement or to have a Registration Statement become effective by a specified date by designating, by notice to the Holders, a Registration Statement that previously has been filed with the SEC or become effective, as the case may be, as the relevant Registration Statement for purposes of satisfying such obligation, and all references to any such obligation shall be construed accordingly; *provided,* that such previously filed Registration Statement may be, and is, amended or, subject to applicable securities laws, supplemented to add the number of Registrable Securities, and, to the extent necessary, to identify as selling stockholders those Holders demanding the filing of a Registration Statement pursuant to the terms of this Agreement. To the extent this Agreement refers to the filing or effectiveness of other Registration Statements, by or at a specified time and the Company has, in lieu of then filing such Registration Statements or having such Registration Statements become effective, designated a previously filed or effective Registration Statement as the relevant Registration Statement for such purposes, in accordance with the preceding sentence, such references shall be construed to refer to such designated Registration Statement, as amended or supplemented in the manner contemplated by the immediately preceding sentence.

ARTICLE III

MISCELLANEOUS

Section 3.1. Termination and Effect of Termination. This Agreement shall terminate upon the date on which no Holder holds any Registrable Securities, except for the provisions of Sections 2.6 and 2.7, which shall survive any such termination. No termination under this Agreement shall relieve any Person of liability for breach or Registration Expenses incurred prior to termination. In the event this Agreement is terminated, each Person entitled to indemnification rights pursuant to Section 2.6 hereof shall retain such indemnification rights with respect to any matter that (i) may be an indemnified liability thereunder and (ii) occurred prior to such termination.

Section 3.2. Permitted Transferees; Assignment. The rights of a Holder hereunder may be assigned (but only with all related obligations as set forth below) in connection with a Transfer of Registrable Securities to a Permitted Transferee of that Holder. Without prejudice to any other or similar conditions imposed hereunder with respect to any such Transfer, no assignment permitted under the terms of this Section 3.2 will be effective unless the Permitted Transferee to which the assignment is being made, if not a Holder, has delivered to the Company a written acknowledgment and agreement in form and substance reasonably satisfactory to the Company that the Permitted Transferee will be bound by, and will be a party to, this Agreement. A Permitted Transferee to whom rights are transferred pursuant to this Section 3.2 may not again transfer those rights to any other Permitted Transferee, other than as provided in this Section 3.2. The Company may not assign its rights (except by merger or in connection with another entity acquiring all or substantially all of the Company's assets) or obligations hereunder without the prior written consent of all the Holders of the then outstanding Registrable Securities.

Section 3.3. Governing Law. This Agreement and all claims or causes of action (whether in tort, contract or otherwise) that may be based upon, arise out of or relate to this

Agreement or the negotiation, execution or performance of this Agreement (including any claim or cause of action based upon, arising out of or related to any representation or warranty made in or in connection with this Agreement) shall be governed by and construed in accordance with the Laws of the State of New York, without giving effect to any choice or conflict of law provision or rule (whether of the State of New York or any other jurisdiction) that would cause the application of the Laws of any jurisdiction other than the State of York.

Section 3.4. Counterparts. This Agreement may be executed in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Counterparts may be delivered via facsimile, electronic mail or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

Section 3.5. Titles and Subtitles. The titles and subtitles used in this Agreement are used for convenience only and are not to be considered in construing or interpreting this Agreement.

Section 3.6. Notices. All notices and other communications given or made pursuant to this Agreement shall be in writing and shall be deemed effectively given upon the earlier of actual receipt, or (a) personal delivery to the party to be notified, (b) when sent, if sent by electronic mail during normal business hours of the recipient, and if not sent during normal business hours, then on the recipient's next Business Day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) Business Day after deposit with a nationally recognized overnight courier, freight prepaid, specifying next Business Day delivery, with written verification of receipt. All communications shall be sent to the respective parties at their address as set forth on the signature page, or to such e-mail address or address as subsequently modified by written notice given in accordance with this Section 3.6.

Section 3.7. Waiver. Waiver by the Company or the Purchaser of a breach hereunder by the Purchaser or the Company, respectively, shall not be construed as a waiver of any subsequent breach of the same or any other provision. No delay or omission by a party in exercising or availing itself of any right, power or privilege hereunder shall preclude the later exercise of any such right, power or privilege by such party. No waiver shall be effective unless made in writing with specific reference to the relevant provision(s) of this Agreement and signed by a duly authorized representative of the party granting the waiver. All remedies, either under this Agreement or by law or otherwise afforded to any party, shall be cumulative and not alternative.

Section 3.8. Amendments. Any term of this Agreement may be amended or terminated only with the written consent of the Company and the Purchaser.

Section 3.9. Severability. The invalidity or unenforceability of any provision hereof shall in no way affect the validity or enforceability of any other provision.

Section 3.10. Entire Agreement. This Agreement and the Purchase Agreement constitute the full and entire understanding and agreement between the parties with respect to the subject matter hereof and thereof, and any other written or oral agreement relating to the subject matter hereof or thereof existing among the parties are expressly canceled.

Section 3.11. Specific Enforcement. The parties hereto agree that irreparable damage

would occur in the event that any of the provisions of this Agreement were not performed in accordance with their specific intent or were otherwise breached. It is accordingly agreed that the parties shall be entitled to an injunction or injunctions to prevent or cure breaches of the provisions of this Agreement and to enforce specifically the terms and provisions hereof, in addition to any other remedy to which they may be entitled by law or equity.

Section 3.12. Exclusive Jurisdiction; Venue. Each of the parties hereto irrevocably agrees that any legal action or proceeding with respect to this Agreement and the rights and obligations arising hereunder, or for recognition and enforcement of any judgment in respect of this Agreement and the rights and obligations arising hereunder brought by another party hereto or its successors or assigns, shall be brought and determined exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan and agrees that it will not bring any action relating to this Agreement or any of the transactions contemplated by this Agreement in any court other than the aforesaid courts. Each of the parties hereto hereby irrevocably waives, and agrees not to assert as a defense, counterclaim or otherwise, in any action or proceeding with respect to this Agreement, (a) any claim that it is not personally subject to the jurisdiction of the above named courts for any reason other than the failure to serve in accordance with this Section 3.12, (b) any claim that it or its property is exempt or immune from the jurisdiction of any such court or from any legal process commenced in such courts (whether through service of notice, attachment prior to judgment, attachment in aid of execution of judgment, execution of judgment or otherwise) and (c) to the fullest extent permitted by the applicable Law, any claim that (i) the suit, action or proceeding in such court is brought in an inconvenient forum, (ii) the venue of such suit, action or proceeding is improper or (iii) this Agreement, or the subject matter hereof, may not be enforced in or by such courts. Each of the parties hereto agrees that service of process upon such party in any such action or proceeding shall be effective if such process is given as a notice in accordance with Section 3.6.

Section 3.13. Waiver of Jury Trial. EACH OF THE PARTIES TO THIS AGREEMENT HEREBY IRREVOCABLY WAIVES TO THE EXTENT PERMITTED BY APPLICABLE LAW ANY AND ALL RIGHT TO A TRIAL BY JURY IN ANY DIRECT OR INDIRECT ACTION, PROCEEDING OR COUNTERCLAIM ARISING OUT OF OR RELATING TO THIS AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY. EACH PARTY (A) CERTIFIES THAT NO REPRESENTATIVE, AGENT OR ATTORNEY OF ANY OTHER PARTY HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PARTY WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE THE FOREGOING WAIVER, (B) MAKES THIS WAIVER VOLUNTARILY, AND (C) ACKNOWLEDGES THAT EACH PARTY HAS BEEN INDUCED TO ENTER INTO THIS AGREEMENT BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS CONTAINED IN THIS SECTION 3.13.

Section 3.14. Independent Nature of Holders' Obligations and Rights. The obligations of each Holder hereunder are several and not joint with the obligations of any other Holder hereunder, and no Holder shall be responsible in any way for the performance of the obligations of any other Holder hereunder. Nothing contained herein or in any other agreement or document delivered at any closing, and no action taken by any Holder pursuant hereto or thereto, shall be deemed to constitute the Holders as a partnership, an association, a joint venture or any other kind of group

or entity, or create a presumption that the Holders are in any way acting in concert or as a group or entity with respect to such obligations or the transactions contemplated by this Agreement or any other matters, and the Company acknowledges that the Holders are not acting in concert or as a group, and the Company shall not assert any such claim, with respect to such obligations or transactions. Each Holder shall be entitled to protect and enforce its rights, including the rights arising out of this Agreement, and it shall not be necessary for any other Holder to be joined as an additional party in any proceeding for such purpose. The use of a single agreement with respect to the obligations of the Company contained herein was solely in the control of the Company, not the action or decision of any Holder, and was done solely for the convenience of the Company and not because it was required or requested to do so by any Holder. It is expressly understood and agreed that each provision contained in this Agreement is between the Company and a Holder, solely, and not between the Company and the Holders collectively and not between and among Holders.

[Signature pages follow]

IN WITNESS WHEREOF, each of the undersigned has duly executed this Agreement as of the date first above written.

Company: ARROWHEAD PHARMACEUTICALS, INC.

By: _____
Name:
Title:

Purchaser: AVORO LIFE SCIENCES FUND LLC

By: _____
Name: Scott Epstein
Title: Partner, Chief Operating Officer &
Chief Compliance Officer

Form of Pre-Funded Warrant

THE SECURITIES REPRESENTED HEREBY AND THE SECURITIES ISSUABLE UPON EXERCISE OF THESE SECURITIES HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933. NO TRANSFER OF THE SECURITIES REPRESENTED HEREBY OR THE SECURITIES ISSUABLE UPON EXERCISE OF THESE SECURITIES MAY BE EFFECTED WITHOUT AN EFFECTIVE REGISTRATION STATEMENT RELATED THERETO OR AN OPINION OF COUNSEL IN A FORM SATISFACTORY TO THE COMPANY THAT SUCH REGISTRATION IS NOT REQUIRED UNDER THE SECURITIES ACT OF 1933.

PRE-FUNDED COMMON STOCK PURCHASE WARRANT

ARROWHEAD PHARMACEUTICALS, INC.

Warrant Shares: [●] Issue Date: [●]

THIS PRE-FUNDED COMMON STOCK PURCHASE WARRANT (the "Warrant") certifies that, for value received, Avoro Life Sciences Fund LLC, a Delaware limited liability company, or its assigns (the "Holder") is entitled, upon the terms and subject to the limitations on exercise and the conditions hereinafter set forth, at any time on or after the date hereof (the "Initial Exercise Date"), to subscribe for and purchase from Arrowhead Pharmaceuticals, Inc., a Delaware corporation (the "Company"), up to [●] shares (as subject to adjustment hereunder, the "Warrant Shares") of Common Stock. The purchase price of one share of Common Stock under this Warrant shall be equal to the Exercise Price, as defined in Section 3(b).

Section 1. Definitions. For purposes of this Warrant, the following terms shall have the following meanings:

a) "Affiliate" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

b) "Business Day" means any day except any Saturday, any Sunday, any day which is a federal legal holiday in the United States or any day on which banking institutions in Pasadena, California are authorized or required by law or other governmental action to close.

c) "Commission" means the United States Securities and Exchange Commission.

d) "Common Stock Equivalents" means any securities of the Company or the Subsidiaries which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, right, option, warrant or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

e) "Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

f) "Person" means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

g) "Securities Act" means the Securities Act of 1933, as amended.

h) "Securities Purchase Agreement" means that certain Securities Purchase Agreement dated as of November 25, 2024.

i) "Trading Day" means a day on which the principal Trading Market is open for trading.

j) "Trading Market" means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market or the New York Stock Exchange (or any successors to any of the foregoing).

k) "Transfer Agent" means Computershare Trust Company, and any successor transfer agent of the Company.

Section 2. Issuance of Securities; Registration of Warrants. The Warrant, as initially issued by the Company, is offered and sold pursuant to the Securities Purchase Agreement. Accordingly, the Warrant and the Warrant Shares are "restricted securities" under Rule 144 promulgated under the Securities Act. The Company shall register ownership of this Warrant, upon records to be maintained by the Company for that purpose (the "Warrant Register"), in the name of the record Holder (which shall include the initial Holder or, as the case may be, any assignee to which this Warrant is permissibly assigned hereunder) from time to time. The Company may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary.

Section 3. Exercise.

a) Exercise of Warrant. Exercise of the purchase rights represented by this Warrant may be made, in whole or in part, at any time or times on or after the Initial Exercise Date by delivery to the Company of a duly executed PDF copy submitted by e-mail (or e-mail attachment) of the Notice of Exercise in the form annexed hereto, and delivered in accordance with the notice requirements set forth in Section 6(g) (the "Notice of Exercise"). Notwithstanding the foregoing, with respect to any Notice of Exercise delivered on or prior to the Initial Exercise Date, the Company agrees to deliver the Warrant Shares subject to such Notice(s) of Exercise by 5:30 p.m. (New York time) on the Initial Exercise Date. Within the earlier of (i) one (1) Trading Day and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined in Section 3(d)(i) herein) following the date of exercise as aforesaid, the Holder shall deliver the aggregate Exercise Price (as defined below) for the Warrant Shares specified in the applicable Notice of Exercise by wire transfer or cashier's check drawn on a United States bank unless the

cashless exercise procedure specified in Section 3(c) below is applicable and specified in the applicable Notice of Exercise. No ink-original Notice of Exercise shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Exercise be required. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company until the Holder has purchased all of the Warrant Shares available hereunder and the Warrant has been exercised in full, in which case, the Holder shall surrender this Warrant to the Company for cancellation within five (5) Trading Days of the date on which the final Notice of Exercise is delivered to the Company. Partial exercises of this Warrant resulting in purchases of a portion of the total number of Warrant Shares available hereunder shall have the effect of lowering the outstanding number of Warrant Shares purchasable hereunder in an amount equal to the applicable number of Warrant Shares purchased. The Holder and the Company shall maintain records showing the number of Warrant Shares purchased and the date of such purchases. The Company shall deliver any objection to any Notice of Exercise within one (1) Trading Day of receipt of such notice. **The Holder and any assignee, by acceptance of this Warrant, acknowledge and agree that, by reason of the provisions of this paragraph, following the purchase of a portion of the Warrant Shares hereunder, the number of Warrant Shares available for purchase hereunder at any given time may be less than the amount stated on the face hereof.**

b) Exercise Price. The aggregate exercise price of this Warrant, except for a nominal exercise price of $0.001 per Warrant Share, was pre-funded to the Company on or prior to the Initial Exercise Date and, consequently, no additional consideration (other than the nominal exercise price of $0.001 per Warrant Share) shall be required to be paid by the Holder to any Person to effect any exercise of this Warrant. The Holder shall not be entitled to the return or refund of all, or any portion, of such pre-paid aggregate exercise price under any circumstance or for any reason whatsoever. The remaining unpaid exercise price per share of Common Stock under this Warrant shall be $0.001, subject to adjustment hereunder (the "Exercise Price").

c) Cashless Exercise. This Warrant may also be exercised, in whole or in part, at such time by means of a "cashless exercise" in which the Holder shall be entitled to receive a number of Warrant Shares equal to the quotient obtained by dividing [(A-B) (X)] by (A), where:

(A) = as applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise if such Notice of Exercise is (1) both executed and delivered pursuant to Section 3(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 3(a) hereof on a Trading Day prior to the opening of "regular trading hours" (as defined in Rule 600(b)(88) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) at the option of the Holder as indicated on the Notice of Exercise, either (y) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise or (z) the Bid Price of the Common Stock on the principal Trading Market as reported by Bloomberg L.P. as of the time of the Holder's execution of the applicable Notice of Exercise if such Notice of Exercise is executed during "regular trading hours" on a Trading Day and is delivered within two (2) hours thereafter (including until two (2) hours after the close of "regular

trading hours" on a Trading Day) pursuant to Section 3(a) hereof or (iii) the VWAP on the date of the applicable Notice of Exercise if the date of such Notice of Exercise is a Trading Day and such Notice of Exercise is both executed and delivered pursuant to Section 3(a) hereof after the close of "regular trading hours" on such Trading Day;

(B) = the Exercise Price of this Warrant, as adjusted hereunder; and

(X) = the number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

If Warrant Shares are issued in such a cashless exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the Warrant Shares shall take on the characteristics of the Warrants being exercised, and for purposes of Rule 144, the holding period of the Warrant Shares being issued may be tacked on to the holding period of this Warrant. The Company agrees not to take any position contrary to this Section 3(c), except to the extent required by change in applicable law, rule or regulation after the date hereof.

"Bid Price" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the bid price of the Common Stock for the time in question (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on The Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined in good faith by the Board of Directors of the Company.

"VWAP" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on The Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by the Board of Directors of the Company and reasonably

agreed to by the Holders of a majority in interest of the Warrants then outstanding.

d) Mechanics of Exercise.

i. Delivery of Warrant Shares Upon Exercise. The Company shall cause the Warrant Shares purchased hereunder to be transmitted to the Holder by crediting the account of the Holder's or its designee's balance account with The Depository Trust Company through its Deposit or Withdrawal at Custodian system ("DWAC") if the Company is then a participant in such system, or, at the request of the Holder, in electronic book entry form to the account of the Holder registered in the Company's share register in the name of the Holder or its designee, for the number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the address specified by the Holder in the Notice of Exercise by the date that is the later of one (1) Trading Day after delivery of the aggregate Exercise Price to the Company and (ii) the number of Trading Days comprising the Standard Settlement Period subject to the delivery to the Company of the Notice of Exercise (such date, the "Warrant Share Delivery Date"). Upon delivery of the Notice of Exercise, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date of delivery of the Warrant Shares, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received by the Warrant Share Delivery Date. The Company agrees to maintain a transfer agent that is a participant in the FAST program so long as this Warrant remains outstanding and exercisable. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Company's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Exercise.

ii. Delivery of New Warrants Upon Exercise. If this Warrant has been exercised in part, the Company shall, at the request of a Holder and upon surrender of this Warrant, as soon as practicable following the time of delivery of the Warrant Shares, deliver to the Holder a new Warrant evidencing the rights of the Holder to purchase the unpurchased Warrant Shares called for by this Warrant, which new Warrant shall in all other respects be identical with this Warrant.

iii. Compensation for Buy-In on Failure to Timely Deliver Warrant Shares Upon Exercise. In addition to any other rights available to the Holder, if the Company fails to transmit to the Holder the Warrant Shares in accordance with the provisions of Section 3(d)(i) above pursuant to an exercise on or before the Warrant Share Delivery Date (other than a failure caused by incorrect or incomplete information provided by the Holder to the Company), and if after such date the Holder purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by the Holder of the Warrant Shares which the Holder anticipated receiving upon such exercise (a "Buy-In"), then the Company shall, within two (2) Trading Days after the Holder's request, (A) pay in cash to the Holder the amount, if any, by which (x) the Holder's total purchase price (including commercially reasonable brokerage commissions, if any) for the shares of Common Stock so purchased exceeds (y) the amount obtained by multiplying (1) the number

of Warrant Shares that the Company was required to deliver to the Holder in connection with the exercise at issue times (2) the price at which the sell order giving rise to such purchase obligation was executed (assuming such sale was executed on commercially reasonable terms at prevailing market prices and, if the sale was executed in multiple transactions, the volume weighted average price), and (B) at the option of the Holder, either reinstate the portion of the Warrant and equivalent number of Warrant Shares for which such exercise was not honored (in which case such exercise shall be deemed rescinded) or deliver to the Holder the number of shares of Common Stock that would have been issued had the Company timely complied with its exercise and delivery obligations hereunder. For example, if the Holder purchases Common Stock having a total purchase price of $11,000 to cover a Buy-In with respect to an attempted exercise of shares of Common Stock with an aggregate sale price giving rise to such purchase obligation of $10,000, under clause (A) of the immediately preceding sentence the Company shall be required to pay the Holder $1,000. The Holder shall provide the Company written notice within two (2) Trading Days after the occurrence of a Buy-In indicating the amounts payable to the Holder in respect of the Buy-In and, upon request of the Company, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver shares of Common Stock upon exercise of the Warrant as required pursuant to the terms hereof.

iv. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such exercise, the Company shall, at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Exercise Price or round up to the next whole share.

v. Charges, Taxes and Expenses. Issuance of Warrant Shares shall be made without charge to the Holder for any issue or transfer tax or other incidental expense in respect of the issuance of such Warrant Shares, all of which taxes and expenses shall be paid by the Company, and such Warrant Shares shall be issued in the name of the Holder or in such name or names as may be directed by the Holder; provided, however, that, in the event that Warrant Shares are to be issued in a name other than the name of the Holder, this Warrant when surrendered for exercise shall be accompanied by the Assignment Form attached hereto duly executed by the Holder and the Company may require, as a condition thereto, the payment of a sum sufficient to reimburse it for any transfer tax incidental thereto. The Company shall, to the extent applicable, pay all Transfer Agent fees required for processing of any Notice of Exercise and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for electronic delivery of the Warrant Shares.

vi. Closing of Books. The Company will not close its stockholder books or records in

any manner which prevents the timely exercise of this Warrant, pursuant to the terms hereof.

e) Holder's Exercise Limitations. The Company shall not effect any exercise of this Warrant, and a Holder shall not have the right to exercise any portion of this Warrant, pursuant to Section 3 or otherwise, to the extent that after giving effect to such issuance after exercise as set forth on the applicable Notice of Exercise, the Holder (together with (i) the Holder's Affiliates, (ii) any other Persons acting as a group together with the Holder or any of the Holder's Affiliates, and (iii) any other Persons whose beneficial ownership of the Common Stock would or could be aggregated with the Holder's for purposes of Section 13(d) of the Exchange Act (such Persons set forth in clause (i) through (iii) above, "Attribution Parties")), would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the Holder and its Attribution Parties shall include the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (i) exercise of the remaining, nonexercised portion of this Warrant beneficially owned by the Holder or any of its Attribution Parties and (ii) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Company (including, without limitation, any other Common Stock Equivalents) subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 3(e), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. The determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Attribution Parties) and of which portion of this Warrant is exercisable shall be in the sole discretion of the Holder, and the submission of a Notice of Exercise shall be deemed to be the Holder's determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Attribution Parties) and of which portion of this Warrant is exercisable, in each case subject to the Beneficial Ownership Limitation, and the Company shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 3(e), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as reflected in (A) the Company's most recent periodic or annual report filed with the Commission, as the case may be, (B) a more recent public announcement by the Company or (C) a more recent written notice from the Company or the Transfer Agent to the Holder setting forth the number of shares of Common Stock outstanding. Upon the written or oral request of a Holder, the Company shall within one (1) Trading Day confirm in writing to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder or its Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 9.99% of the number of shares

of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon exercise of this Warrant. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Company; provided, that the Beneficial Ownership Limitation may not be increased above 9.99%. Any decrease in the Beneficial Ownership Limitation will be effective immediately upon delivery of such notice to the Company The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 3(e) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation herein contained or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of this Warrant.

f) No Set-off. To the extent permitted by law and subject to Section 3(d)(iii), the Company's obligations to issue and deliver Warrant Shares in accordance with and subject to the terms hereof (including the limitations set forth in 3(e)) are absolute and unconditional, irrespective of any action or inaction by the Holder to enforce the same, any waiver or consent with respect to any provision hereof, the recovery of any judgment against any Person or any action to enforce the same, or any setoff, counterclaim, recoupment, limitation or termination, or any breach or alleged breach by the Holder or any other Person of any obligation to the Company or any violation or alleged violation of law by the Holder or any other Person, and irrespective of any other circumstance that might otherwise limit such obligation of the Company to the Holder in connection with the issuance of Warrant Shares. Subject to Section 3(d)(iii), nothing herein shall limit the Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver shares of Common Stock upon exercise of the Warrant as required pursuant to the terms hereof.

Section 4. Certain Adjustments.

a) Stock Dividends and Splits. If the Company, at any time while this Warrant is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions on shares of its Common Stock or any other equity or equity equivalent securities payable in shares of Common Stock (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Company upon exercise of this Warrant), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of reverse stock split) outstanding shares of Common Stock into a smaller number of shares of Common Stock, or (iv) issues by reclassification of shares of the Common Stock any shares of capital stock of the Company, then in each case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding treasury shares, if any) outstanding immediately before such event and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event, and the number of shares issuable upon exercise of this Warrant shall be proportionately adjusted such that the aggregate Exercise Price of this Warrant shall remain unchanged. Any adjustment made pursuant to this Section 4(a) shall become effective immediately after the record date for the determination of stockholders

entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Subsequent Rights Offerings. In addition to (but without duplication of) any adjustments pursuant to Section 4(a) above, if at any time the Company grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then, in each such case, upon any exercise of this Warrant that occurs after the record date fixed for determination of stockholders entitled to receive such distribution, the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights; provided, however, that, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (and shall not be entitled to beneficial ownership of such Common Stock as a result of such Purchase Right (and beneficial ownership) to such extent) and such Purchase Right to such extent shall be held in abeyance for the benefit of the Holder until such time or times as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation, at which time or times the Holder shall be granted such right (and any Purchase Right granted, issued or sold on such initial Purchase Right or on any subsequent Purchase Right to be held similarly in abeyance) to the same extent as if there had been no such limitation, provided, further, that such Purchase Rights need not be held in abeyance for the benefit of the Holder if the Holder was separately offered substantially equivalent Purchase Rights outside of the Warrant.

c) Pro Rata Distributions. During such time as this Warrant is outstanding, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution; provided, however, that, to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such

Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until the earlier of (i) such time, if ever, as the delivery to such Holder of such portion would not result in the Holder exceeding the Beneficial Ownership Limitation and (ii) such time as the Holder has exercised this Warrant.

d) Fundamental Transaction. If, at any time while this Warrant is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another Person, in which the Company is not the surviving entity or the stockholders of the Company immediately prior to such merger or consolidation do not own, directly or indirectly, at least 50% of the voting power of the surviving entity immediately after such merger or consolidation, (ii) the Company, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Company or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of more than 50% of the voting power of the capital stock of the Company, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off, merger or scheme of arrangement) with another Person or group of Persons whereby such other Person or group acquires more than 50% of the voting power of the capital stock of the Company (not including any shares of capital stock of the Company held by the other Person or other Persons making or party to, or associated or affiliated with the other Persons making or party to, such stock or share purchase agreement or other business combination) and in connection with such transaction the Common Stock is converted into or exchanged for other securities, cash or property (each a "Fundamental Transaction"), then, upon the consummation of such Fundamental Transaction, this Warrant shall automatically be converted into the right of the Holder to receive, for each Warrant Share that would have been issuable upon such exercise immediately prior to the occurrence of such Fundamental Transaction (without regard to any limitation in Section 3(e) on the exercise of this Warrant) the securities, cash and other property of the successor or acquiring corporation (or ultimate parent thereof) or of the Company, if it is the surviving corporation, as applicable, (the "Alternate Consideration") receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Warrant is exercisable immediately prior to such Fundamental Transaction (without regard to any limitation in Section 3(e) on the exercise of this Warrant). For purposes of this Section 4(d), the determination of the Exercise Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Company shall apportion the Exercise Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any

different components of the Alternate Consideration. If holders of capital stock of the Company are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon the consummation of any such Fundamental Transaction. The Company shall not effect a Fundamental Transaction in which the Company is not the surviving corporation or the Alternate Consideration includes securities of another Person unless (i) the Alternate Consideration is solely cash and the definitive agreement in respect thereof provides for the simultaneous "cashless exercise" of this Warrant pursuant to Section 3(c), or (ii) prior to or simultaneously with the consummation thereof, any successor to the Company or surviving entity (the "Successor Entity") shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Warrant referring to the "Company" shall refer instead to the Successor Entity) and shall assume all of the obligations of the Company under this Warrant with the same effect as if such Successor Entity had been named as the Company herein.

e) Calculations. All calculations under this Section 4 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 4, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding treasury shares, if any) issued and outstanding.

f) Notice to Holder.

i. Adjustment to Exercise Price. Whenever the Exercise Price is adjusted pursuant to any provision of this Section 4, the Company shall promptly deliver to the Holder by email a notice setting forth the Exercise Price after such adjustment and any resulting adjustment to the number of Warrant Shares and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Exercise by Holder. If (A) the Company shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Company shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Company shall authorize the granting to all holders of the Common Stock rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Company shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Company (and all of its Subsidiaries, taken as a whole) is a party, any sale or transfer of all or substantially all of the assets of the Company, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property, or (E) the Company shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Company, then, in each case, the Company shall cause to be delivered by email to the Holder at its last email address as it shall appear upon the Warrant Register (as defined below), at least 10 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend,

distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange; provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. Holder agrees to maintain any information disclosed pursuant to this Section 4(f) in confidence until such information is publicly available, and shall comply with applicable law with respect to trading in the Company's securities following receipt any such information; provided, however, that to the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Company or any of its subsidiaries, the Company shall simultaneously file such notice with the SEC (as defined in the Securities Purchase Agreement) pursuant to a Current Report on Form 8-K.

Section 5. Transfer of Warrant.

a) Transferability. Subject to compliance with any applicable securities laws, this Warrant and all rights hereunder (including, without limitation, any registration rights) are transferable, in whole or in part, upon surrender of this Warrant at the principal office of the Company or its designated agent, together with a written assignment of this Warrant substantially in the form attached hereto duly executed by the Holder or its agent or attorney and funds sufficient to pay any transfer taxes payable upon the making of such transfer. Upon such surrender and, if required, such payment, the Company shall execute and deliver a new Warrant or Warrants in the name of the assignee or assignees, as applicable, and in the denomination or denominations specified in such instrument of assignment, and shall issue to the assignor a new Warrant evidencing the portion of this Warrant not so assigned, and this Warrant shall promptly be cancelled. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company unless the Holder has assigned this Warrant in full, in which case, the Holder shall surrender this Warrant to the Company within five (5) Trading Days of the date on which the Holder delivers an assignment form to the Company assigning this Warrant in full. The Warrant, if properly assigned in accordance herewith, may be exercised by a new holder for the purchase of Warrant Shares without having a new Warrant issued.

b) New Warrants. This Warrant may be divided or combined with other Warrants upon presentation hereof at the aforesaid office of the Company, together with a written notice specifying the names and denominations in which new Warrants are to be issued, signed by the Holder or its agent or attorney. Subject to compliance with Section 5(a), as to any transfer which may be involved in such division or combination, the Company shall execute and deliver a new Warrant or Warrants in exchange for the Warrant or Warrants to be divided or combined in accordance with such notice. All Warrants issued on transfers

or exchanges shall be dated the initial issuance date of this Warrant and shall be identical with this Warrant except as to the number of Warrant Shares issuable pursuant thereto.

c) Warrant Register. The Company shall register this Warrant in the Warrant Register in the name of the record Holder hereof from time to time. The Company may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary.

Section 6. Miscellaneous.

a) No Rights as Stockholder Until Exercise; No Settlement in Cash. This Warrant does not entitle the Holder to any voting rights, dividends or other rights as a stockholder of the Company prior to the exercise hereof as set forth in Section 3(d)(i), except as expressly set forth in Section 4.

b) Loss, Theft, Destruction or Mutilation of Warrant. The Company covenants that upon receipt by the Company of evidence reasonably satisfactory to it of the loss, theft, destruction or mutilation of this Warrant or any stock certificate relating to the Warrant Shares, and in case of loss, theft or destruction, of indemnity or security reasonably satisfactory to it (which, in the case of the Warrant, shall not include the posting of any bond), and upon surrender and cancellation of such Warrant or stock certificate, if mutilated, the Company will make and deliver a new Warrant or stock certificate of like tenor and dated as of such cancellation, in lieu of such Warrant or stock certificate.

c) Saturdays, Sundays, Holidays, etc. If the last or appointed day for the taking of any action or the expiration of any right required or granted herein shall not be a Business Day, then, such action may be taken or such right may be exercised on the next succeeding Business Day.

d) Authorized Shares. The Company covenants that, during the period the Warrant is outstanding, it will reserve from its authorized and unissued Common Stock a sufficient number of shares to provide for the issuance of the Warrant Shares upon the exercise of any purchase rights under this Warrant. The Company further covenants that its issuance of this Warrant shall constitute full authority to its officers who are charged with the duty of issuing the necessary Warrant Shares upon the exercise of the purchase rights under this Warrant. The Company will take all such reasonable action as may be necessary to assure that such Warrant Shares may be issued as provided herein without violation of any applicable law or regulation, or of any requirements of the Trading Market upon which the Common Stock may be listed. The Company covenants that all Warrant Shares which may be issued upon the exercise of the purchase rights represented by this Warrant will, upon exercise of the purchase rights represented by this Warrant and payment for such Warrant Shares in accordance herewith, be duly authorized, validly issued, fully paid and nonassessable and free from all taxes, liens and charges created by the Company in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously with such issue).

Except and to the extent as waived or consented to by the Holder, the Company shall not by any action, including, without limitation, amending its certificate of incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such actions as may be necessary or appropriate to protect the rights of Holder as set forth in this Warrant against impairment. Without limiting the generality of the foregoing, the Company will (i) not increase the par value of any Warrant Shares above the amount payable therefor upon such exercise immediately prior to such increase in par value, (ii) take all such action as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable Warrant Shares upon the exercise of this Warrant and (iii) use commercially reasonable efforts to obtain all such authorizations, exemptions or consents from any public regulatory body having jurisdiction thereof, as may be, necessary to enable the Company to perform its obligations under this Warrant.

Before taking any action which would result in an adjustment in the number of Warrant Shares for which this Warrant is exercisable or in the Exercise Price, the Company shall obtain all such authorizations or exemptions thereof, or consents thereto, as may be necessary from any public regulatory body or bodies having jurisdiction thereof.

e) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Warrant shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. Each party agrees that all legal proceedings concerning the interpretations, enforcement and defense of the transactions contemplated by this Warrant shall be commenced exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is improper or is an inconvenient venue for such proceeding. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Warrant and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law. If either party shall commence an action, suit or proceeding to enforce any provisions of this Warrant, the prevailing party in such action, suit or proceeding shall be reimbursed by the other party for their reasonable attorneys' fees and other costs and expenses incurred with the investigation, preparation and prosecution of such action or proceeding.

f) Nonwaiver and Expenses. No course of dealing or any delay or failure to exercise any right hereunder on the part of Holder shall operate as a waiver of such right or otherwise

prejudice the Holder's rights, powers or remedies. Without limiting any other provision of this Warrant, if the Company willfully and knowingly fails to comply with any provision of this Warrant, which results in any material damages to the Holder, the Company shall pay to the Holder such amounts as shall be sufficient to cover any costs and expenses including, but not limited to, reasonable attorneys' fees, including those of appellate proceedings, incurred by the Holder in collecting any amounts due pursuant hereto or in otherwise enforcing any of its rights, powers or remedies hereunder.

g) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Exercise, shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service, addressed to the Company, at Arrowhead Pharmaceuticals, Inc., 117 E. Colorado Blvd., Suite 700, Pasadena, CA 91105, Attention: General Counsel, e-mail: General.Counsel@arrowheadpharma.com, or such other email address or address as the Company may specify for such purposes by notice to the Holders. Any and all notices or other communications or deliveries to be provided by the Company hereunder shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service addressed to each Holder at the e-mail address or address of such Holder appearing on the books of the Company. Any notice or other communication or deliveries hereunder shall be deemed effectively given upon the earlier of actual receipt, or (a) personal delivery to the party to be notified, (b) when sent, if sent by electronic mail during normal business hours of the recipient, and if not sent during normal business hours, then on the recipient's next Business Day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) Business Day after deposit with a nationally recognized overnight courier, freight prepaid, specifying next Business Day delivery, with written verification of receipt.

h) Limitation of Liability. No provision hereof, in the absence of any affirmative action by the Holder to exercise this Warrant to purchase Warrant Shares, and no enumeration herein of the rights or privileges of the Holder, shall give rise to any liability of the Holder for the purchase price of any Common Stock or as a stockholder of the Company, whether such liability is asserted by the Company or by creditors of the Company.

i) Remedies. The Holder, in addition to being entitled to exercise all rights granted by law, including recovery of damages, will be entitled to specific performance of its rights under this Warrant without the need to post a bond or make any undertaking. The Company agrees that monetary damages would not be adequate compensation for any loss incurred by reason of a breach by it of the provisions of this Warrant and hereby agrees to waive and not to assert the defense in any action for specific performance that a remedy at law would be adequate.

j) Successors and Assigns. Subject to applicable securities laws, this Warrant and the rights and obligations evidenced hereby shall inure to the benefit of and be binding upon the successors and permitted assigns of the Company and the successors and permitted assigns of Holder. The provisions of this Warrant are intended to be for the benefit of any Holder from time to time of this Warrant and shall be enforceable by the Holder or holder of Warrant Shares.

k) Amendment. This Warrant may be modified or amended or the provisions hereof waived with the written consent of the Company, on the one hand, and the Holder, on the other hand.

l) Severability. Wherever possible, each provision of this Warrant shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Warrant shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provisions or the remaining provisions of this Warrant.

m) Headings. The headings used in this Warrant are for the convenience of reference only and shall not, for any purpose, be deemed a part of this Warrant.

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(Signature Page Follows)

IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its officer thereunto duly authorized as of the date first above indicated.

ARROWHEAD PHARMACEUTICALS, INC.

By: _____

Name:

Title:

NOTICE OF EXERCISE

TO: **ARROWHEAD PHARMACEUTICALS, INC.**

(1) The undersigned hereby elects to purchase _____ Warrant Shares of the Company pursuant to the terms of the attached Warrant (only if exercised in full), and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.

(2) Payment shall take the form of (check applicable box):

☐ in lawful money of the United States; or

☐ if permitted the cancellation of such number of Warrant Shares as is necessary, in accordance with the formula set forth in subsection 3(c), to exercise this Warrant with respect to the maximum number of Warrant Shares purchasable pursuant to the cashless exercise procedure set forth in subsection 3(c).

(3) Please issue said Warrant Shares in the name of the undersigned or in such other name as is specified below:

The Warrant Shares shall be delivered to the following DWAC Account Number:

[SIGNATURE OF HOLDER]

Name of Investing Entity:

_____

Signature of Authorized Signatory of Investing Entity:

_____

Name of Authorized Signatory:

_____

Title of Authorized Signatory:

_____

Date:

_____

_____

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name:

_____

(Please Print)

Address: _____

Phone Number: (Please Print)

Email Address:

Dated: _____ __, _____ _____

Holder's Signature: _____

_____

Holder's Address:

_____

CERTAIN INFORMATION IN THIS DOCUMENT, MARKED BY [**], HAS BEEN EXCLUDED PURSUANT TO REGULATION S-K, ITEM 601(b)(10)(iv). SUCH EXCLUDED INFORMATION IS NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.

THE FOLLOWING INFORMATION IS SUPPLIED SOLELY FOR U.S. FEDERAL INCOME TAX PURPOSES. THE LOANS UNDER THIS AGREEMENT ARE TREATED AS HAVING **BEEN ISSUED WITH ORIGINAL ISSUE DISCOUNT ("OID") WITHIN THE MEANING OF** SECTION 1273 OF THE INTERNAL REVENUE CODE OF 1986**, AS AMENDED (THE "CODE"),** AND THIS LEGEND IS REQUIRED BY SECTION 1275(c) OF THE CODE. INFORMATION INCLUDING THE ISSUE PRICE, THE AMOUNT OF ORIGINAL ISSUE DISCOUNT, THE ISSUE DATE AND THE YIELD TO MATURITY WILL BE PROVIDED IN WRITING TO A LENDER PROMPTLY UPON REQUEST TO THE BORROWER AT 177 E. COLORADO BLVD, SUITE 700, PASADENA, CALIFORNIA 91105, ATTN: CHIEF FINANCIAL OFFICER, EMAIL: CFO@arrowheadpharma.com.

FINANCING AGREEMENT

dated as of August 7, 2024

among

ARROWHEAD PHARMACEUTICALS, INC.,
as Borrower,

CERTAIN SUBSIDIARIES OF BORROWER,
as Guarantors,

VARIOUS LENDERS FROM TIME TO TIME PARTY HERETO,

AND

SIXTH STREET LENDING PARTNERS,
as Administrative Agent

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FINANCING AGREEMENT

This FINANCING AGREEMENT, dated as of August 7, 2024, is entered into by and among ARROWHEAD PHARMACEUTICALS, INC., a Delaware corporation ("Company" or "Borrower"), and certain Subsidiaries of Borrower, as Guarantors, the Lenders from time to time party hereto, and SIXTH STREET LENDING PARTNERS, ("Sixth Street"), as administrative agent for the Lenders (in such capacity, "Administrative Agent").

W I T N E S S E T H:

WHEREAS, capitalized terms used in these Recitals shall have the respective meanings set forth for such terms in Section 1.1 hereof;

WHEREAS, Lenders have agreed to extend certain senior secured credit facilities to Company, in an aggregate principal amount not to exceed $935,261,000, consisting of (a) an initial term loan in an aggregate principal amount not exceeding $400,000,000, (b) a delayed draw term loan an aggregate principal amount not exceeding $435,261,000 and (c) an uncommitted incremental facility in an aggregate principal amount not to exceed $100,000,000, in each case, the proceeds of which will be used as described in Section 2.2;

WHEREAS, Company has agreed to secure all of its Obligations by granting to Administrative Agent, for the benefit of Secured Parties, a first priority Lien on all of its assets (except as otherwise set forth in the Collateral Documents), including a pledge of all of the Capital Stock of each of its Subsidiaries; and

WHEREAS, Guarantors have agreed to guarantee the Obligations of Company hereunder and to secure their respective Obligations by granting to Administrative Agent, for the benefit of Secured Parties, a first priority Lien on all of their respective assets (except as otherwise set forth in the Collateral Documents), including a pledge or mortgage of all of the Capital Stock of each of their respective Subsidiaries.

NOW, THEREFORE, in consideration of the premises and the agreements, provisions and covenants herein contained, the parties hereto agree as follows:

ARTICLE I

DEFINITIONS AND INTERPRETATION

Section 1.1 Definitions. The following terms used herein, including in the preamble, recitals, exhibits and schedules hereto, shall have the following meanings:

"Administrative Agent" has the meaning specified in the preamble hereto.

"Administrative Agent's Account" means an account at a bank designated by Administrative Agent from time to time as the account into which the Loan Parties shall make all payments to Administrative Agent under this Agreement and the other Loan Documents.

"Adverse Proceeding" means any action, suit, claim, proceeding (whether administrative, judicial or otherwise), governmental investigation or arbitration (whether or not purportedly on behalf of Borrower or any of its Subsidiaries) at law or in equity, or before or by any Governmental Authority, domestic or foreign (including any Environmental Claims) or other regulatory body or any mediator or arbitrator,

whether pending or, to the knowledge of the Loan Parties, threatened in writing against Borrower or any of its Subsidiaries or any property of Borrower or any of its Subsidiaries.

"Affiliate" means, as applied to any Person, any other Person directly or indirectly controlling, controlled by, or under common control with, that Person. For the purposes of this definition, "control" (including, with correlative meanings, the terms "controlling," "controlled by" and "under common control with"), as applied to any Person, means the possession, directly or indirectly, of the power (a) to vote 15% or more of the securities having ordinary voting power for the election of directors of such Person, or (b) to direct or cause the direction of the management and policies of that Person, whether through the ownership of voting securities or Capital Stock, by contract or otherwise. Notwithstanding anything herein to the contrary, in no event shall Administrative Agent or any Lender or any of their Affiliates or Related Funds be considered an "Affiliate" of any Loan Party.

"Aggregate Amounts Due" has the meaning specified in Section 2.13.

"Aggregate Payments" has the meaning specified in Section 7.2.

"Agreed Security Principles" has the meaning specified in Section 5.12(a).

"Agreement" means this Financing Agreement and any annexes, exhibits and schedules attached hereto, as it may be amended, supplemented or otherwise modified from time to time.

"Anti-Corruption Laws" means all Requirements of Law concerning or relating to bribery or corruption, including, without limitation, the United States Foreign Corrupt Practices Act of 1977, and the anti-bribery and anti-corruption laws and regulations of those jurisdictions in which the Loan Parties do business.

"Anti-Terrorism Laws" means any Requirement of Law relating to terrorism or money laundering, including, without limitation, (a) the Money Laundering Control Act of 1986 (i.e., 18 U.S.C. §§ 1956 and 1957), (b) the Currency and Foreign Transactions Reporting Act (31 U.S.C. §§ 5311-5330 and 12 U.S.C. §§ 1818(s), 1820(b) and 1951-1959) (the "Bank Secrecy Act"), (c) the USA PATRIOT Act, (d) the laws, regulations and Executive Orders administered by the United States Department of the Treasury's Office of Foreign Assets Control ("OFAC"), (e) the Comprehensive Iran Sanctions, Accountability, and Divestment Act of 2010 and implementing regulations by the United States Department of the Treasury, (f) any law prohibiting or directed against terrorist activities or the financing of terrorist activities (e.g., 18 U.S.C. §§ 2339A and 2339B), or (g) any similar laws enacted in the United States or any other jurisdictions in which the parties to this Agreement operate, as any of the foregoing laws may from time to time be amended, renewed, extended, or replaced and all other present and future legal requirements of any Governmental Authority governing, addressing, relating to, or attempting to eliminate, terrorist acts and acts of war and any regulations promulgated pursuant thereto.

"Application Event" means the (a) occurrence of an Event of Default and (b) the election by Administrative Agent or the Required Lenders during the continuance of such Event of Default to require that payments and proceeds of Collateral be applied pursuant to Section 2.12(f).

"ARO-HBV" means the pharmaceutical product candidate having the chemical structures set forth on Schedule 1.1(a), including all forms (including salt forms), presentations, strengths, doses, and formulations (including any method of delivery), either alone or as a Combination Product, and all other "Licensed Products" (as defined in the ARO-HBV License Agreement) licensed or sublicensed to one or more third parties under the ARO-HBV License Agreement.

"ARO-HBV License Agreement" means that certain Amended and Restated License Agreement by and between Arrowhead Pharmaceuticals, Inc. and GlaxoSmithKline Intellectual Property (No. 3) Limited dated as of December 11, 2023.

"Asset Sale" means a sale, lease or sublease (as lessor or sublessor), sale and leaseback, assignment, conveyance, transfer, license or sublicense or other disposition to (other than to a Loan Party), or any exchange of property with, any Person (other than to a Loan Party), in one transaction or a series of transactions, in each case of all or any part of any Loan Party's businesses, assets or properties of any kind, whether real, personal, or mixed and whether tangible or intangible, including but not limited to any Product Intellectual Property Rights, Platform Intellectual Property Rights, Registrations, Regulatory Documentation, or Collateral, whether now owned or hereafter acquired, including the Capital Stock of any Loan Party (but excluding any issuance, sale, transfer or other disposition of Capital Stock of the Borrower). For purposes of clarification, "Asset Sale" shall include the following transactions (other than with Loan Parties): (a) the sale or other disposition for value of any contracts to a third party, (b) any disposition of property through a "plan of division" under the Delaware Limited Liability Company Act or any comparable transaction under any similar law, (c) the early termination (other than in accordance with its terms) or modification of any contract resulting in the receipt by any Loan Party of a cash payment or other consideration (other than reversion of Intellectual Property) in exchange for such event, (d) any sale of accounts (or any rights thereto (including, without limitation, any rights to any residual payment stream with respect thereto)) by any Loan Party or Subsidiary of Borrower or (e) any sale, lease or sublease (as lessor or sublessor), sale and leaseback, assignment, conveyance, transfer, license or sublicense or other disposition (i) of Capital Stock pursuant to any Joint Venture, (ii) pursuant to any Product Agreement, (iii) pursuant to any Permitted Product Transaction, (iv) pursuant to any Royalty Monetization Transaction, (v) pursuant to any Permitted Zodasiran Agreement or (vi) of economic rights or Intellectual Property Rights related to the Products or Platform Technology of the Company and its Subsidiaries.

"Assignment Agreement" means an Assignment and Assumption Agreement substantially in the form of Exhibit C, with such amendments or modifications as may be approved by Administrative Agent.

"Authorized Officer" means, as applied to any Person, any individual holding the position of chairman of the board (if an officer), director, chief executive officer, president or one of its vice presidents (or the equivalent thereof), and such Person's chief financial officer or treasurer.

"Bank Secrecy Act" has the meaning specified in the definition of "Anti-Terrorism Laws".

"Bankruptcy Code" means Title 11 of the United States Code entitled "Bankruptcy," as now and hereafter in effect, or any successor statute.

"Beneficial Ownership Certification" means a certification regarding beneficial ownership required by the Beneficial Ownership Regulation.

"Beneficial Ownership Regulation" means 31 C.F.R. § 1010.230.

"Beneficiary" means Administrative Agent and each Lender.

"Benefit Plan" means any of (a) an "employee benefit plan" (as defined in Section 3(3) of ERISA) that is subject to Title I of ERISA, (b) a "plan" as defined in Section 4975 of the Internal Revenue Code to which Section 4975 of the Internal Revenue Code applies and (c) any Person whose assets include (for purposes of the Plan Asset Regulations or otherwise for purposes of Title I of ERISA or Section 4975 of the Internal Revenue Code) the assets of any such "employee benefit plan" or "plan".

"Blocked Person" means any Person: (a) that is publicly identified (i) on the most current list of "Specially Designated Nationals and Blocked Persons" published by OFAC or resides, is organized or chartered, or has a place of business in a country or territory subject to OFAC sanctions or embargo program or (ii) as prohibited from doing business with the United States under the International Emergency Economic Powers Act, the Trading With the Enemy Act, or any other Anti-Terrorism Law; (b) that is owned or controlled by, or that owns or controls, or that is acting for or on behalf of, any Person described in clause (a) above; (c) which any Lender is prohibited from dealing or otherwise engaging in any transaction by any Anti-Terrorism Law; and (d) that is affiliated or associated with a Person described in clauses (a), (b), or (c) above.

"Board of Directors" means, (a) with respect to any corporation or company, the board of directors of the corporation, company or any committee thereof duly authorized to act on behalf of such board, (b) with respect to a partnership, the board of directors of the general partner of the partnership, (c) with respect to a limited liability company, the managing member or members or any controlling committee or board of directors of such company or the sole member or the managing member thereof, and (d) with respect to any other Person, the board or committee of such Person serving a similar function.

"Borrower" has the meaning specified in the preamble hereto and is interchangeable with the term "Company".

"Business Day" means any day that is not a Saturday, Sunday or other day on which the Federal Reserve Bank of New York is closed.

"Capital Lease" means, as applied to any Person, and subject to Section 1.2(a), any lease of any property (whether real, personal or mixed) by that Person (a) as lessee that, in conformity with GAAP, is or should be accounted for as a capital lease on the balance sheet of that Person or (b) as lessee which is a transaction of a type commonly known as a "synthetic lease" (i.e., a transaction that is treated as an operating lease for accounting purposes but with respect to which payments of rent are intended to be treated as payments of principal and interest on a loan for income tax purposes).

"Capital Stock" means any and all shares, interests, participations or other equivalents (however designated) of capital stock of a corporation, any and all equivalent ownership interests in a Person (other than a corporation), including, without limitation, shares, partnership interests and membership interests, and any and all warrants, rights or options to purchase or other arrangements or rights to acquire any of the foregoing; provided that Capital Stock shall exclude debt securities and other Indebtedness convertible into or exchangeable for any of the foregoing (including without limitation, Permitted Convertible Indebtedness).

"Cash" means cash, money, currency or a credit balance in any demand or Deposit Account or in any Securities Account or other investment account.

"Cash Equivalents" means, as at any date of determination, (a) marketable securities (i) issued or directly and unconditionally guaranteed as to interest and principal by the United States Government, or (ii) issued by any agency of the United States the obligations of which are backed by the full faith and credit of the United States, in each case maturing within one year after such date, (b) marketable direct obligations issued by any state of the United States of America or any political subdivision of any such state or any public instrumentality thereof, in each case maturing within one year after such date and having, at the time of the acquisition thereof, a rating of at least A 1 from S&P or at least P 1 from Moody's, (c) commercial paper maturing no more than one year from the date of creation thereof and having, at the time of the acquisition thereof, a rating of at least A 1 from S&P or at least P 1 from Moody's, (d) certificates of deposit or bankers' acceptances maturing within one year after such date and issued or accepted by any Lender or

by any commercial bank organized under the laws of the United States of America or any state thereof or the District of Columbia that (i) is at least "adequately capitalized" (as defined in the regulations of its primary Federal banking regulator), and (ii) has Tier 1 capital (as defined in such regulations) of not less than $100,000,000, (e) shares of any money market mutual fund that (i) has substantially all of its assets invested continuously in the types of investments referred to in clauses (a) and (b) above, (ii) has net assets of not less than $500,000,000, and (iii) has the highest rating obtainable from either S&P or Moody's, (f) securities that are consistent with the Borrower's investment policy, a copy of which has been delivered to the Lenders (including any amendments thereto after the Closing Date consented to by the Administrative Agent, such consent not to be unreasonably withheld), and (g) in the case of any Foreign Subsidiary, cash and cash equivalents that are substantially equivalent in such jurisdiction to those described in clauses (a) through (f) above in respect of each country that is a member of the Organization for Economic Co-operation and Development.

"Change of Control" means, at any time, any of the following occurrences:

(a) any Person or "group" (within the meaning of Rules 13d-3 and 13d-5 under the Exchange Act) (i) shall have acquired beneficial ownership of [**]% or more on a fully diluted basis of the voting and/or economic interest in the securities or Capital Stock of Borrower or (ii) shall have obtained the power (whether or not exercised) to elect a majority of the members of the Board of Directors (or similar governing body) of Borrower; provided that for purposes of this provision, any Person or group shall not be deemed to beneficially own Capital Stock to be acquired by such Person or group pursuant to a stock or asset purchase agreement, merger agreement, option agreement, warrant agreement or similar agreement (or voting or option or similar agreement related thereto) until the consummation of the acquisition of the Capital Stock in connection with the transactions contemplated;

(b) except pursuant to a transaction expressly permitted by this Agreement, Borrower shall cease to beneficially own and control, directly or indirectly, 100% on a fully diluted basis of the economic and voting interest in the Capital Stock of each Loan Party;

(c) the majority of the seats (other than vacant seats) on the Board of Directors (or similar governing body) of Borrower cease to be occupied by Persons who either (i) were members of the Board of Directors of Borrower on the Closing Date, or (ii) were nominated for election by the Board of Directors of Borrower, a majority of whom were directors on the Closing Date or whose election or nomination for election was previously approved by a majority of such directors, in each case, excluding any director that is an interim appointee due to death or retirement;

(d) any "change of control" or similar event shall occur under, and as defined in or set forth in the documents evidencing or governing any Indebtedness in an individual principal amount in excess of the Threshold Amount owed by Borrower or any of its Subsidiaries; or

(e) the Common Stock fails to remain (i) registered with the SEC or (ii) publicly traded on and registered with a public securities exchange.

"Closing Date" means the date on which the Initial Term Loans are made, which is August 7, 2024.

"Closing Date Certificate" means a Closing Date Certificate substantially in the form of Exhibit D.

"Collateral" means, collectively, all of the real, personal and mixed property (including Capital Stock) and all interests therein and proceeds thereof now owned or hereafter acquired by any Loan Party upon which a Lien is granted or purported to be granted by such Loan Party in favor of the Administrative

Agent pursuant to the Collateral Documents as security for the Obligations; provided, however, that in no event shall Excluded Assets constitute Collateral.

"Collateral Access Agreement" means a collateral access agreement in form and substance reasonably satisfactory to Administrative Agent.

"Collateral Documents" means the Pledge and Security Agreement, the Collateral Access Agreements, if any, any Control Agreement, any Mortgages and all other instruments, documents and agreements delivered by any Loan Party pursuant to this Agreement or any of the other Loan Documents in order to grant to Administrative Agent, for the benefit of Secured Parties, a Lien on any real, personal or mixed property of that Loan Party as security for the Obligations, in each case, as such Collateral Documents may be amended or otherwise modified from time to time.

"Combination Product" means [**].

"Commercialize" means any and all activities directed to (a) solely with respect to the Company and its Subsidiaries, the out-licensing of any Platform Technology or (b) the distribution, marketing, detailing, promotion, selling and securing of reimbursement of a Product (including the importing, selling and offering for sale of such Product), and shall include post-marketing approval studies to the extent required by a Governmental Authority, post-launch marketing, promoting, detailing, distributing, selling such Product, importing, exporting or transporting such Product for sale, and regulatory compliance with respect to the foregoing. When used as a verb, "Commercialize" shall mean to engage in Commercialization. Except with respect to post-marketing approval studies required by a Governmental Authority, Commercialization shall not include any activities directed to the research or development (including pre-clinical and clinical development) or manufacture of a Product.

"Commercially Reasonable Efforts" means, with respect to the Borrower's development or Commercialization of a Material Product, that level of efforts and resources commonly dedicated in the research-based pharmaceutical industry by a similarly situated biotechnology company of similar resources to the development or commercialization, as the case may be, of a product of similar commercial potential at a similar stage of development or commercialization for a similar therapeutic and disease area and of similar market potential, in each case taking into account issues of safety and efficacy, product profile, the proprietary position (including patent and regulatory and data exclusivity), present and future market and commercial potential, the then current competitive environment for such product and the likely timing of such product's entry into the market, the regulatory environment and status of such product (including likelihood of receiving regulatory approval or pricing and reimbursement approval), and other relevant scientific, technical and commercial factors. Notwithstanding the foregoing, Borrower's Commercially Reasonable Efforts shall be determined on a Material Product-by-Material Product and country-by-country basis and it is anticipated that the level of effort and resources that constitute "Commercially Reasonable Efforts" with respect to a particular Material Product or country will change over time, reflecting changes in the status of such Material Product, as applicable, and the country involved.

"Commitment" means any Term Loan Commitment or Delayed Draw Term Loan Commitment.

"Common Stock" means Borrower's common stock.

"Company" has the meaning specified in the preamble hereto and is interchangeable with the term "Borrower".

"Compliance Certificate" means a Compliance Certificate substantially in the form of Exhibit B.

"Confidential Information" has the meaning assigned to such term in Section 10.20.

"Connection Income Taxes" means Other Connection Taxes that are imposed on or measured by net income (however denominated) or that are franchise Taxes or branch profits Taxes.

"Consolidated Total Cash" means, at any date of determination, total unrestricted cash and Cash Equivalents (other than restrictions created by the Collateral Documents and nonconsensual Permitted Liens described in clauses (u) and (v) of the definition thereof) as of such date, which, in connection with any determination under the definition of Permitted Acquisition, shall be determined on a pro forma basis, after giving effect to the applicable Permitted Acquisition, and in each case as certified by the chief financial officer or Authorized Officer of Borrower to Administrative Agent.

"Contractual Obligation" means, as applied to any Person, any provision of any security issued by that Person or of any indenture, mortgage, deed of trust, contract (including, but not limited to, any Material Contract), undertaking, agreement, license or other instrument to which that Person is a party or by which it or any of its properties is bound or to which it or any of its properties is subject.

"Control" means, with respect to any Intellectual Property Right, that an entity (a) owns or (b) has the right to grant access, a license or a sublicense (as applicable) to such Intellectual Property Right.

"Control Agreement" means a "springing" control agreement, in form and substance reasonably satisfactory to Administrative Agent, executed and delivered by the applicable Loan Party, Administrative Agent, and the applicable securities intermediary (with respect to a Securities Account) or bank (with respect to a Deposit Account).

"Copyrights" has the meaning ascribed to such term in the definition of "Intellectual Property Rights."

"Core Markets" means [**].

"Counterpart Agreement" means a Counterpart Agreement substantially in the form of Exhibit F delivered by a Loan Party pursuant to Section 5.10.

"Credit Date" means the date of a Credit Extension.

"Credit Extension" means the making of a Loan.

"Data" means customer lists, correspondence, data, submissions and licensing and purchasing histories relating to customers of Borrower or any Subsidiary, and all other reports, information and documentation collected or maintained by Borrower or any Subsidiary regarding purchasers of Borrower's or such Subsidiary's products and the visitors to websites owned or controlled by Borrower or any of its Subsidiaries.

"Data Protection Laws" means applicable Requirements of Law concerning the protection, privacy or security of Personal Information (including any applicable laws of jurisdictions where the Personal Information was collected or otherwise processed) and other applicable consumer protection laws, and all regulations promulgated thereunder, including, without limitation, the General Data Protection Regulation (and all laws implementing or supplementing it), the California Consumer Privacy Act, and Section 5 of the Federal Trade Commission Act.

"Debtor Relief Law" means the Bankruptcy Code and any other liquidation, conservatorship, bankruptcy, assignment for the benefit of creditors, moratorium, rearrangement, receivership, insolvency, reorganization or similar debtor relief law of the United States or other applicable jurisdiction from time to time in effect.

"Default" means a condition or event that, after notice or lapse of time or both, would constitute an Event of Default.

"Default Excess" means, with respect to any Defaulting Lender, the excess, if any, of such Defaulting Lender's Pro Rata Share of the aggregate outstanding principal amount of Term Loans of all Lenders (calculated as if all Defaulting Lenders (other than such Defaulting Lender) had funded all of their respective Defaulted Loans) over the aggregate outstanding principal amount of all Term Loans of such Defaulting Lender.

"Default Period" means, with respect to any Defaulting Lender, the period commencing on the date of the applicable Funding Default or violation of Section 9.5(c), as applicable, and ending on the earliest of the following dates: (a) the date on which all Term Loan Commitments are cancelled or terminated and/or the Obligations are declared or become immediately due and payable, (b) the date on which (i) the Default Excess with respect to such Defaulting Lender shall have been reduced to zero (whether by the funding by such Defaulting Lender of any Defaulted Loans of such Defaulting Lender or by the non pro rata application of any voluntary or mandatory prepayments of the Loans in accordance with the terms of Section 2.9 or Section 2.10 or by a combination thereof), and (ii) such Defaulting Lender shall have delivered to Company and Administrative Agent a written reaffirmation of its intention to honor its obligations hereunder with respect to its Term Loan Commitments, (c) the date on which Company, Administrative Agent and Required Lenders waive all Funding Defaults of such Defaulting Lender in writing, and (d) the date on which Administrative Agent shall have waived all violations of Section 9.5(c), by such Defaulting Lender in writing.

"Default Rate" means any interest payable pursuant to Section 2.6.

"Defaulted Loan" has the meaning specified in Section 2.17.

"Defaulting Lender" has the meaning specified in Section 2.17.

"Delayed Draw Commitment Period" means the time period commencing on the Closing Date through and including the Delayed Draw Commitment Termination Date.

"Delayed Draw Commitment Termination Date" means the earliest to occur of (a) Term Loan Maturity Date, (b) the date on which both the Initial Term Loan and the Initial Delayed Draw Term Loans are paid in full, and (c) the date on which the Delayed Draw Term Loan Commitments are reduced to zero.

"Delayed Draw Term Loan Commitment" means the commitment of a Lender to make or otherwise fund the Initial Delayed Draw Term Loans. The amount of each Lender's Delayed Draw Term Loan Commitment, if any, is set forth on Appendix A-2 or in the applicable Assignment Agreement, subject to any adjustment or reduction pursuant to the terms and conditions hereof. The aggregate amount of the Delayed Draw Term Loan Commitments as of the Closing Date is $435,261,000.

"Delayed Draw Term Loans" means the Initial Delayed Draw Term Loans and the Incremental Term Loans.

"Deposit Account" means a demand, time, savings, passbook or like account with a bank, savings and loan association, credit union or like organization, other than an account evidenced by a negotiable certificate of deposit.

"Designated Guarantor" shall have the meaning assigned to such term in the definition of Excluded Subsidiary.

"Disputes" has the meaning set forth in Section 4.23(d).

"Disqualified Capital Stock" means any Capital Stock that, by its terms (or by the terms of any security or other Capital Stock into which it is convertible or for which it is exchangeable), or upon the happening of any event or condition, (a) matures or is mandatorily redeemable, pursuant to a sinking fund obligation or otherwise, (b) is redeemable at the option of the holder thereof, in whole or in part, (c) provides for the scheduled payments of dividends or distributions in cash, or (d) is convertible into or exchangeable for (i) Indebtedness or (ii) any other Capital Stock that would constitute Disqualified Capital Stock, in each case of clauses (a) through (d), prior to the date that is [**] after the Term Loan Maturity Date and other than solely for Qualified Capital Stock or as a result of a change of control or asset sale (so long as any rights of the holders thereof upon the occurrence of a change of control or asset sale event shall be subject to the prior repayment in full of the Loans and all other Obligations that are accrued and payable and the termination of the Term Loan Commitments); provided that if such Capital Stock is issued pursuant to a plan for the benefit of current or former employees, directors, independent contractors or other service providers of the Loan Parties or by any such plan to such current or former employees, directors, independent contractors or other service providers, such Capital Stock shall not constitute Disqualified Capital Stock solely because it may be required to be repurchased by a Loan Party in order to satisfy applicable statutory or regulatory obligations, including tax withholding, or as a result of such current or former employee's, director's, independent contractor's or other service provider's termination, death or disability; provided further that Disqualified Capital Stock shall exclude Permitted Equity Derivatives.

"Disqualified Institution" means (a) those Persons that are competitors of the Borrower and its Subsidiaries that are operating companies, (b) those banks, financial institutions, other institutional lenders (or related funds of such institutional lenders) and other Persons separately identified in writing from time to time by the Borrower to the Administrative Agent (and to the extent so identified after the Closing Date, reasonably acceptable to the Administrative Agent), or (c) in the case of clause (a) or (b), any of their respective Affiliates that are (x) readily identifiable as Affiliates on the basis of their name or (y) identified by name by the Borrower to the Administrative Agent in writing from time to time; provided that the foregoing shall not apply retroactively to disqualify any Person that previously acquired or agreed to acquire an assignment or participation interest in the Loans, solely with respect to such previously acquired Loans or participation interests, to the extent such Person was not a Disqualified Institution at the time of the applicable assignment or participation, as the case may be, but shall apply to disqualify any such Person from taking any prospective assignments of or participation interests in any Loans; provided, further, that the list of Disqualified Institutions shall not be delivered by the Administrative Agent to any other Person, except that, upon an inquiry by any Lender to the Administrative Agent as to whether a specific potential assignee or prospective participant is a Disqualified Institution, the Administrative Agent shall be permitted to disclose to such Lender whether such specific potential assignee or prospective participant is a Disqualified Institution

"Dollars" and the sign "$" mean the lawful money of the United States of America.

"Domestic Subsidiary" means any Subsidiary organized under the laws of the United States of America, any State thereof or the District of Columbia.

"Eligible Assignee" means (a) any Lender, any Affiliate of any Lender and any Related Fund (any two or more Related Funds being treated as a single Eligible Assignee for all purposes hereof), (b) any commercial bank, insurance company, investment or mutual fund or other entity that is an "accredited investor" (as defined in Regulation D under the Securities Act) and which extends credit or buys loans as one of its businesses, and (c) any other Person (other than a natural Person) approved by Administrative Agent; provided, none of (i) Borrower, (ii) any Affiliate of Borrower, (iii) any Person owning or controlling any trade debt or Indebtedness of any Loan Party (other than the Obligations) or any Capital Stock of any Loan Party (in each case, unless approved by Administrative Agent), (iv) so long as no Event of Default has occurred and is continuing, any competitor of Borrower or its Subsidiaries or (v) so long as no Event of Default has occurred and is continuing, any Disqualified Institution shall, in any event, be an Eligible Assignee without the written consent of the Borrower.

"EMA" means the European Medicines Agency or any successor thereto.

"Employee Benefit Plan" means any "employee benefit plan" as defined in Section 3(3) of ERISA which is or was sponsored, maintained or contributed to by, or required to be contributed by, Borrower, any of its Subsidiaries or any of their respective ERISA Affiliates.

"Environmental Claim" means any complaint, summons, citation, investigation, notice, directive, notice of violation, order, claim, demand, action, litigation, judicial or administrative proceeding, judgment, letter or other communication from any Governmental Authority or any other Person, involving (a) any actual or alleged violation of any Environmental Law, (b) any Hazardous Material or any actual or alleged Hazardous Materials Activity, (c) injury to the environment, natural resource, any Person (including wrongful death) or property (real or personal) in connection with Hazardous Materials or actual or alleged violations of Environmental Laws, or (d) actual or alleged Releases or threatened Releases of Hazardous Materials either (i) on, at or migrating from any assets, properties or businesses currently or formerly owned or operated by any Loan Party or any of its Subsidiaries or any predecessor in interest, (ii) from adjoining properties or businesses, or (iii) onto any facilities which received Hazardous Materials generated by any Loan Party or any of its Subsidiaries or any predecessor in interest.

"Environmental Laws" means any and all current or future foreign or domestic, federal or state (or any subdivision of either of them), statutes, ordinances, orders, rules, regulations, judgments, decrees, permits, licenses or binding determinations of any Governmental Authorizations, or any other requirements of Governmental Authorities relating to (a) the manufacture, generation, use, storage, transportation, treatment, disposal or Release of Hazardous Materials, or (b) occupational safety and health, industrial hygiene, land use or the protection of the environment, human, plant or animal health or welfare.

"Environmental Liabilities and Costs" means all liabilities, monetary obligations, losses (including monies paid in settlement), damages, punitive damages, natural resources damages, consequential damages, treble damages, costs and expenses (including all reasonable fees, disbursements and expenses of counsel, experts and consultants and costs of investigations and feasibility studies), fines, penalties, sanctions and interest incurred in connection with any Remedial Action, any Environmental Claim, or any other claim or demand by any Governmental Authority or any Person that relates to any actual or alleged violation of Environmental Laws, actual or alleged exposure or threatened exposure to Hazardous Materials, or any actual or alleged Release or threatened Release of Hazardous Materials.

"Environmental Lien" means any Lien in favor of any Governmental Authority for Environmental Liabilities and Costs.

"ERISA" means the Employee Retirement Income Security Act of 1974.

"ERISA Affiliate" means, as applied to any Person, (a) any corporation which is a member of a controlled group of corporations within the meaning of Section 414(b) of the Internal Revenue Code of which that Person is a member; (b) any trade or business (whether or not incorporated) which is a member of a group of trades or businesses under common control within the meaning of Section 414(c) of the Internal Revenue Code of which that Person is a member; and (c) any member of an affiliated service group within the meaning of Section 414(m) or (o) of the Internal Revenue Code of which that Person, any corporation described in clause (a) above or any trade or business described in clause (b) above is a member. Any former ERISA Affiliate of Borrower or any of its Subsidiaries shall continue to be considered an ERISA Affiliate of Borrower or any such Subsidiary within the meaning of this definition with respect to the period such entity was an ERISA Affiliate of Borrower or such Subsidiary and with respect to liabilities arising after such period for which Borrower or such Subsidiary could be liable under the Internal Revenue Code or ERISA.

"ERISA Event" means (a) a "reportable event" within the meaning of Section 4043 of ERISA and the regulations issued thereunder with respect to any Pension Plan (excluding those for which the provision for thirty day notice to the PBGC has been waived by regulation), (b) the failure to meet the minimum funding standard of Section 412 of the Internal Revenue Code with respect to any Pension Plan (whether or not waived in accordance with Section 412(d) of the Internal Revenue Code) or the failure to make by its due date a required installment under Section 412(m) of the Internal Revenue Code with respect to any Pension Plan or the failure to make any required contribution to a Multiemployer Plan, (c) the provision by the administrator of any Pension Plan pursuant to Section 4041(a)(2) of ERISA of a notice of intent to terminate such plan in a distress termination described in Section 4041(c) of ERISA, (d) the withdrawal by Borrower, any of its Subsidiaries or any of their respective ERISA Affiliates from any Pension Plan with two or more contributing sponsors or the termination of any such Pension Plan resulting in liability to Borrower, any of its Subsidiaries or any of their respective Affiliates pursuant to Section 4063 or 4064 of ERISA, (e) the institution by the PBGC of proceedings to terminate any Pension Plan, or the occurrence of any event or condition which might constitute grounds under ERISA for the termination of, or the appointment of a trustee to administer, any Pension Plan, (f) the imposition of liability on Borrower, any of its Subsidiaries or any of their respective ERISA Affiliates pursuant to Section 4062(e) or 4069 of ERISA or by reason of the application of Section 4212(c) of ERISA, (g) the withdrawal of Borrower, any of its Subsidiaries or any of their respective ERISA Affiliates in a complete or partial withdrawal (within the meaning of Sections 4203 and 4205 of ERISA) from any Multiemployer Plan if there is any potential liability therefor, or the receipt by Borrower, any of its Subsidiaries or any of their respective ERISA Affiliates of notice from any Multiemployer Plan that it is in reorganization or insolvency pursuant to Section 4241 or 4245 of ERISA, or that it intends to terminate or has terminated under Section 4041A or 4042 of ERISA, (h) the occurrence of an act or omission which could give rise to the imposition on Borrower, any of its Subsidiaries or any of their respective ERISA Affiliates of fines, penalties, taxes or related charges under Chapter 43 of the Internal Revenue Code or under Section 409, Section 502(c), (i) or (l), or Section 4071 of ERISA in respect of any Employee Benefit Plan, (i) the assertion of a material claim (other than routine claims for benefits) against any Employee Benefit Plan other than a Multiemployer Plan or the assets thereof, or against Borrower, any of its Subsidiaries or any of their respective ERISA Affiliates in connection with any Employee Benefit Plan, (j) receipt from the Internal Revenue Service of notice of the failure of any Pension Plan (or any other Employee Benefit Plan intended to be qualified under Section 401(a) of the Internal Revenue Code) to qualify under Section 401(a) of the Internal Revenue Code, or the failure of any trust forming part of any Pension Plan to qualify for exemption from taxation under Section 501(a) of the Internal Revenue Code, or (k) the imposition of a Lien pursuant to Section 401(a)(29) or 412(n) of the Internal Revenue Code or pursuant to ERISA with respect to any Pension Plan.

"Erroneous Distribution" has the meaning specified therefor in Section 9.12.

"Event of Default" means each of the conditions or events set forth in Section 8.1.

"Exchange Act" means the Securities Exchange Act of 1934, as amended from time to time, and any successor statute.

"Excluded Account" means Deposit Accounts and/or Securities Accounts, (a) the balance of which consists exclusively of withheld income taxes and foreign, federal, state or local employment taxes in such amounts as are required to be paid to the Internal Revenue Service or any other government agencies within the following two months with respect to employees of Borrower or any of its Subsidiaries, (b) used exclusively for payroll to or for the benefit of employees of Borrower or any of its Subsidiaries in such amounts as are required to be paid to such employees within the immediately succeeding two payroll cycles, (c) which are exclusively health care reimbursement accounts or employee benefits accounts, including any accounts exclusively containing amounts required to be paid over to an employee benefit plan pursuant to DOL Reg. Sec. 2510.3-102 on behalf of or for the benefit of employees of Borrower or any of its Subsidiaries, (d) which are segregated accounts and constitute (and the balance of which consists solely of funds set aside in connection with) fiduciary accounts and trust accounts, (e) which are exclusively holding cash collateral or other deposits constituting Liens permitted by clauses (g), (o) and (ff) of Permitted Liens, (f) segregated accounts that hold cash proceeds of Royalties sold pursuant to a Permitted Royalty Transaction involving Plozasiran, (g) which are zero-balance accounts or (h) that have amounts on deposit that do not exceed $[**] individually or $[**] in the aggregate at any one time.

"Excluded Assets" shall mean, with respect to any Loan Party, (a) Excluded Equity Interests and (b) "Excluded Assets" as defined in the applicable Security Agreement to which such Loan Party is a party and with respect to any Foreign Subsidiary subject to the Agreed Security Principles.

"Excluded Equity Interests" means, collectively: (i) any Capital Stock in any Subsidiary with respect to which the grant to the Administrative Agent, for the benefit of Lenders and the other Secured Parties, of a security interest in and Lien upon, and the pledge to the Administrative Agent, for the benefit of Lenders and the other Secured Parties, of, such Capital Stock, to secure the Obligations (and any guaranty thereof) are validly prohibited by requirements of law; (ii) any Capital Stock in any Subsidiary with respect to which the grant to the Administrative Agent, for the benefit of Lenders and the other Secured Parties, of a security interest in and Lien upon, and the pledge to the Administrative Agent, for the benefit of Lenders and the other Secured Parties, of, such Capital Stock, to secure the Obligations (and any guaranty thereof) require the consent, approval or waiver of any Governmental Authority or other third party and such consent, approval or waiver has not been obtained by Borrower following Borrower's commercially reasonable efforts to obtain the same; (iii) any Capital Stock in any Subsidiary that is a non-wholly-owned Subsidiary that the grant to the Administrative Agent, for the benefit of Lenders and the other Secured Parties, of a security interest in and Lien upon, and the pledge to the Administrative Agent, for the benefit of Lenders and the other Secured Parties, of, such Capital Stock, to secure the Obligations (and any guaranty thereof) are validly prohibited by, or would give any third party (other than Borrower or an Affiliate of Borrower) the right to terminate its obligations under, the operating or organizational documents or the joint venture agreement or shareholder agreement with respect to, or any other contract with such third party relating to such non-wholly-owned Subsidiary, including any contract evidencing Indebtedness of such non-wholly-owned Subsidiary (other than customary non-assignment provisions which are ineffective under Article 9 of the Code or other Requirements of Law), but only, in each case, to the extent, (x) the Borrower used commercially reasonable efforts to prevent the prohibition of the pledge such Capital Stock in any non-wholly-owned Subsidiary hereunder and (y) for so long as such operating or organizational document, joint venture agreement, shareholder agreement or other contract is in effect; (iv) any Capital Stock in any other Subsidiary with respect to which, Borrower and the Administrative Agent reasonably determine by mutual agreement that granting the Administrative Agent, for the benefit of Lenders and the other Secured Parties, a security interest in and Lien upon, and pledging to the Administrative Agent, for the benefit of Lenders and the other Secured Parties, such Capital Stock, to secure the Obligations (and any guaranty thereof) could result in material adverse tax consequences to the Borrower or its Subsidiaries; (v)

any Capital Stock in any other Subsidiary with respect to which, Borrower and the Administrative Agent reasonably determine by mutual agreement that the cost of granting the Administrative Agent, for the benefit of Lenders and the other Secured Parties, a security interest in and Lien upon, and pledging to the Administrative Agent, for the benefit of Lenders and the other Secured Parties, such Capital Stock, to secure the Obligations (and any guaranty thereof) are excessive, relative to the value to be afforded to the Secured Parties thereby; and (vi) any other Capital Stock expressly included in the definition of "Excluded Assets."

"Excluded Perfection Action" means, collectively, (a) any filings or other action in any jurisdiction outside of the Specified Jurisdictions or required by the Laws of any jurisdiction outside of the Specified Jurisdictions to create or perfect any security interest in any assets located or titled outside of the Specified Jurisdictions, except any such filings or other actions with respect to Intellectual Property Rights registered in any jurisdiction outside the Specified Jurisdictions that Administrative Agent may reasonably request from time to time, (b) any bailee waivers, landlord waivers, estoppels or collateral access letters, in each case to the extent such waivers and letters are not capable of being obtained after the use of commercially reasonable efforts by the Borrower and its Subsidiaries, (c) any notices to be sent to account debtors or other contractual third parties (other than after the occurrence of an Event of Default), (d) any perfection action to the extent this Agreement or the Collateral Documents applicable to the relevant Loan Party expressly provides such action is not required, (e) any control agreements or arrangements with respect to any assets other than Deposit Accounts and Securities Accounts that are not Excluded Accounts and (f) delivery of any stock certificates of Persons other than Loan Parties and Material Subsidiaries.

"Excluded Subsidiary" means, (a) any not-for-profit Subsidiary, (b) any captive insurance entity, (c) any merger Subsidiary formed in connection with a Permitted Acquisition so long as such merger Subsidiary is merged out of existence pursuant to such Permitted Acquisition or dissolved within [**] of its formation thereof or such later date as permitted by Administrative Agent in its reasonable discretion, (d) [reserved], (e) any Subsidiary that (i) had assets representing [**]% or less of the total assets of Company and its Subsidiaries, determined on a consolidated basis in accordance with GAAP, as of the last day of the most recent Fiscal Quarter for which financial statements have been, or were required to be, delivered pursuant to Section 3.1(f), Section 5.1(b) or (c), as applicable (the "Test Date"), (ii) contributed [**]% or less of the total revenues of Borrower and its Subsidiaries, for the Fiscal Quarter ended on the Test Date, and (iii) had, as of the applicable Test Date, Cash and Cash Equivalents representing [**]% or less of the total Cash and Cash Equivalents of Company and its Subsidiaries, for the Fiscal Quarter ended on the Test Date; provided, if at any time and from time to time after the Closing Date, Subsidiaries that are not Loan Parties comprise in the aggregate more than [**]% of the total assets of Company and its Subsidiaries as of the Test Date, contribute more than [**]% of the total revenues of Company and its Subsidiaries for the Fiscal Quarter ended on the Test Date, and hold, as of the applicable Test Date, more than [**]% of the total Cash and Cash Equivalents of Company and its Subsidiaries for the Fiscal Quarter ended on the Test Date, then Borrower shall, not later than [**] after the date by which financial statements for such period are required to be delivered (or such longer period as the Administrative Agent may agree in its reasonable discretion), designate in writing to Administrative Agent that one or more of such Subsidiaries is no longer an Excluded Subsidiary for purposes of this Agreement to the extent required such that the foregoing condition ceases to be true, (f) [reserved], or (g) any Subsidiary that is prohibited or restricted by any Requirement of Law or by contractual obligations existing on the Closing Date (or, in the case of any newly acquired Subsidiary, in existence at the time of acquisition but not entered into in contemplation thereof (unless in connection with a Joint Venture otherwise permitted hereunder) or for the purpose of avoiding a guarantee of the Obligations) from guaranteeing the Obligations or if guaranteeing the Obligations would require governmental (including regulatory) consent, approval, license or authorization, unless such consent, approval, license or authorization has been obtained or Visirna and any of its Subsidiaries. The Excluded Subsidiaries on the Closing Date are set forth on Schedule 1.1(b).

Notwithstanding anything to the contrary, the Borrower may, in its reasonable discretion, designate any Subsidiary that otherwise qualifies as an "Excluded Subsidiary" pursuant to any one or more of clauses (a) through (g) above as not being an Excluded Subsidiary by written notice to the Administrative Agent (any such subsidiary as an Excluded Subsidiary, a "Designated Guarantor") and, following such designation, may re-designate such Subsidiary as an Excluded Subsidiary with the consent of the Administrative Agent.

"Excluded Taxes" has the meaning specified in Section 2.15(a).

"Extraordinary Receipts" means any cash received by Borrower or any of its Subsidiaries not in the ordinary course of business (and not consisting of proceeds of transactions described in Section 2.10(b), (c), (e), (f), (g), (h), (i) and (j) hereof), including, without limitation, (a) tax refunds, (b) pension plan reversions, (c) judgments, proceeds of settlements or other consideration of any kind in connection with any cause of action (including but not limited to infringement actions and breach of contract claims for the enforcement of Intellectual Property Rights), (d) condemnation awards (and payments in lieu thereof), (e) indemnity payments (excluding reimbursements for out-of-pocket costs and expenses actually incurred and paid to non-Affiliates of the Borrower or any of its Subsidiaries), and (f) any purchase price adjustment received in connection with any purchase agreement.

"Fair Share" has the meaning specified in Section 7.2.

"FASB ASC" means the Accounting Standards Codification of the Financial Accounting Standards Board.

"FATCA" means Sections 1471 through 1474 of the Internal Revenue Code, in effect as of the date of this Agreement (or any amended or successor version that is substantively comparable and not materially more onerous to comply with), any current or future regulations or official interpretations thereof and any agreements entered into pursuant to Section 1471(b)(1) of the Internal Revenue Code, and any fiscal or regulatory legislation, rules, or practices adopted pursuant to any intergovernmental agreement, treaty, or convention among Governmental Authorities and implementing such Sections of the Internal Revenue Code.

"Fazirsiran" means the pharmaceutical product candidate having the chemical structure set forth on Schedule 1.1(a), including all forms, presentations, strengths, doses, and formulations (including any method of delivery), either alone or as a Combination Product, and all other "Products" (as defined in the Fazirsiran License Agreement) licensed or sublicensed to one or more third parties under the Fazirsiran License Agreement.

"Fazirsiran License Agreement" means that certain Exclusive License and Co-Funding Agreement, by and between Takeda Pharmaceuticals U.S.A., Inc. and Arrowhead Pharmaceuticals Inc. dated as of October 7, 2020, as amended by that certain First Amendment entered into as of March 15, 2022 but effective retroactively as of October 7, 2020.

"Fazirsiran Payments" means [**].

"Fazirsiran Payment Adjustment" has the meaning set forth in Section 2.10(e).

"Fazirsiran Payment Shortfall Amount" has the meaning set forth in Section 2.10(e).

"FDA" means the U.S. Food and Drug Administration or any successor thereto.

"FDA Laws" means the Federal Food, Drug, and Cosmetic Act (21 U.S.C. § 301 et seq.) and all applicable statutes, rules, regulations, and orders and Requirements of Law administered, implemented, enforced or issued thereunder by FDA, or any applicable statutes, rules, regulations, and orders and Requirements of Law administered, implemented, enforced or issued by any comparable Governmental Authority.

"Federal Health Care Program Laws" means collectively, federal Medicare or federal or state Medicaid statutes, Sections 1128, 1128A, 1128B, 1128C or 1877 of the Social Security Act (42 U.S.C. §§ 1320a-7, 1320a-7a, 1320a-7b, 1320a-7c, 1320a-7h and 1395nn), the federal TRICARE statute (10 U.S.C. § 1071 et seq.), the civil False Claims Act of 1863 (31 U.S.C. § 3729 et seq.), criminal false claims statutes (e.g., 18 U.S.C. §§ 287 and 1001), the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. § 3801 et seq.), and related regulations or other Requirements of Law that directly or indirectly govern the health care industry, programs of Governmental Authorities related to healthcare, health care professionals or other health care participants, or relationships among health care providers, suppliers, distributors, manufacturers and patients, and the pricing, sale and reimbursement of health care items or services including the collection and reporting requirements, and the processing of any applicable rebate, chargeback or adjustment, under applicable rules and regulations relating to the Medicaid Drug Rebate Program (42 U.S.C. § 1396r-8) and any state supplemental rebate program, Medicare average sales price reporting (42 U.S.C. § 1395w-3a), the Public Health Service Act (42 U.S.C. § 256b), the VA Federal Supply Schedule (38 U.S.C. § 8126) or under any state pharmaceutical assistance program or U.S. Department of Veterans Affairs agreement, and any successor government programs.

"Federal Health Care Programs" shall mean the Medicare, Medicaid and TRICARE programs and any other state or federal health care program, as defined in 42 U.S.C. § 1320a-7b(f).

"Fee Letter" means the letter agreement, dated the Closing Date, between Company and Administrative Agent, as amended, amended and restated, supplemented or otherwise modified from time to time.

"Financial Officer Certification" means, with respect to the financial statements for which such certification is required, the certification of the chief financial officer of Borrower that such financial statements fairly present, in all material respects, the financial condition of Borrower and its Subsidiaries as at the dates indicated and the results of their operations and their cash flows for the periods indicated, subject to changes resulting from audit and normal year-end adjustments.

"First Commercial Sale" means, with respect to a Product and a country, the first sale for monetary value to a third party by the Borrower or its Subsidiaries for use or consumption by the end user of such Product in such country after regulatory approval for such Product has been obtained in such country. Sales prior to receipt of regulatory approval for such Product, such as so-called "treatment IND sales," "named patient sales," and "compassionate use sales," shall not be construed as a First Commercial Sale.

"Fiscal Quarter" means a fiscal quarter of any Fiscal Year.

"Fiscal Year" means the fiscal year of Borrower and its Subsidiaries ending on September 30 of each calendar year.

"Flow of Funds Agreement" means that certain Flow of Funds Agreement, dated as of the Closing Date, duly executed by Company, Administrative Agent, and any other person party thereto, in form and substance reasonably satisfactory to Administrative Agent.

"Foreign Legal Reservations" shall mean:

(a) the principle that equitable remedies are remedies which may be granted or refused at the discretion of the court and principles of good faith and fair dealing;

(b) the application of bankruptcy, insolvency, liquidation, reorganization, court schemes, moratorium, administration, receivership, examinership or other similar laws affecting creditors' rights generally and subject to general principles of equity, regardless of whether considered in a proceeding in equity or at law;

(c) the existence of timing limitations with respect to the bringing of claims under applicable limitation laws and the defenses of acquiescence, set-off or counterclaim and the possibility that an undertaking to assume liability for, or to indemnify a Person against, non-payment of stamp duty may be void;

(d) the principle that in certain jurisdictions and under certain circumstances a Lien granted by way of fixed charge may be re-characterized as a floating charge or that security purported to be constituted as an assignment may be re-characterized as a charge;

(e) the principle that additional interest imposed pursuant to any relevant agreement may be held to be unenforceable on the grounds that it is a penalty and thus void;

(f) the principle that a court may not give effect to an indemnity for legal costs incurred by an unsuccessful litigant;

(g) [reserved];

(h) the principle that a court may not give effect to any parallel debt provisions, covenants to pay or other similar provisions;

(i) the principle that certain remedies in relation to regulated entities may require further approval from government or regulatory bodies or pursuant to agreements with such bodies; and

(j) the principles of private and procedural laws which affect the enforcement of a foreign court judgment.

"Foreign Lender" means (a) if Borrower is a U.S. Person, a Lender that is not a U.S. Person, and (b) if Borrower is not a U.S. Person, a Lender that is resident or organized under the laws of a jurisdiction other than that in which Borrower is resident for tax purposes.

"Foreign Official" means any officer or employee of a non-U.S. government or any department, agency, or instrumentality thereof, or of a public international organization, or any person acting in an official capacity for or on behalf of any such government or department, agency, or instrumentality, or for or on behalf of any such public international organization.

"Foreign Sovereign Immunities Act" means the US Foreign Sovereign Immunities Act of 1976 (28 U.S.C. Sections 1602-1611), as amended.

"Foreign Subsidiary" means any Subsidiary that is not a Domestic Subsidiary.

"FTC" means the U.S. Federal Trade Commission or any successor thereto.

"Funding Default" has the meaning specified in Section 2.17.

"Funding Notice" means a written notice substantially in the form of Exhibit A.

"GAAP" means, subject to the limitations on the application thereof set forth in Section 1.2, United States generally accepted accounting principles in effect as of the date of determination thereof.

"Global Net Sales" means, with respect to any Product for any period (except with respect to any such Product that is the subject of a Product Agreement, in which case, the equivalent definition to this "Global Net Sales" definition included in such Product Agreement to the extent applicable to such revenues shall control), (a) the consolidated worldwide gross revenues generated by (a) the sale of such Product by the Borrower, its Affiliates, or Licensees, throughout the world during such period, less, without duplication, (i) customary trade, quantity and cash discounts allowed in the ordinary course, (ii) amounts repaid or credited due to refunds, credits, rebates, charge backs, retroactive price adjustments and any other similar allowances which effectively reduce the selling price, (iii) amounts repaid or credited due to product returns, (iv) an allowance for transportation, distribution, packaging, freight, postage, shipping and insurance expenses or other distribution expenses, to the extent not reimbursed by the purchaser of the Product, not to exceed [**] of gross invoiced sales, (v) rebates and similar payments made with respect to sales paid for by any governmental or regulatory authority such as, by way of non-limiting illustration, Federal or state Medicaid, Medicare or similar state program or equivalent foreign governmental program, (vi) the portion of administrative fees paid during the relevant time period to group purchasing organizations or pharmaceutical benefit managers relating to such Product, (vii) customs and excise duties and other non-recoverable taxes or duties levied or imposed on such revenues (excluding income or net profit taxes or franchise taxes of any kind), to the extent not reimbursed by the purchaser of the Product, (viii) that portion of the annual fee on prescription drug manufacturers imposed by the Patient Protection and Affordable Care Act, Pub. L. No. 111-148 (as amended) that is allocated to such sales (ix) [reserved], and (x) credit card charges (including processing fees) accrued on such sales of Product and not already taken as a gross-to-net deduction in accordance with GAAP in the calculation of sales of Product (collectively, the "Permitted Deductions"), and (b) any additional consideration received by the Borrower, or any of its Subsidiaries in connection with the sale of such Product by the Borrower, its Subsidiaries, or Licensees to third parties (including any transfer price received from distributors with respect to such Product), all, in respect of clauses (a) and (b), as determined in accordance with GAAP (or applicable international accounting standards) and calculated on a basis consistent with the applicable financial statements of the Borrower, its Affiliates, or Licensees. For purposes of determining Global Net Sales of Products, a "sale" shall not include transfers or dispositions of such Product for pre-clinical or clinical purposes or as samples or for charitable, promotional, manufacturing, testing, qualification or regulatory purposes, in each case, to the extent at or below the Borrower's, its Affiliates', or Licensees' cost of goods therefor. Global Net Sales shall not include sales or transfers between or among the Borrower, its Affiliates, or its or their or Licensees for subsequent resale by such selling entity.

Except with respect to any Product that is a Combination Product under its applicable Product Agreement, in which case, the definition of such Combination Product (or the provisions of such Product Agreement specifying the calculation of net sales with respect to a Combination Product) included in such Product Agreement shall control, if any Product is sold as a Combination Product in any country, then Global Net Sales for such Combination Product will be calculated by the following (such process, the "Combination Product Calculation"): (1) multiplying the actual Global Net Sales of such Combination Product in such country by the fraction A/(A+B), where A is the weighted (by sales volume) average gross sales price in such country of the Product if sold separately in such country, and B is the weighted average gross sales price in such country of the ready for sale form of the other therapeutically active ingredient(s) in the Combination Product that are not a Product (the "Other Components"), if sold separately in such country; (2) if, on a country-by-country basis, the Other Components are not sold separately in a country, Global Net Sales in such country for the purpose of determining royalty payments on Global Net Sales of the Combination Product shall be calculated by multiplying actual Global Net Sales of such Combination

Product in such country by the fraction A/C where A is the weighted average gross sales price in such country of the Product, if sold separately in such country, and C is the weighted average gross sales price of the Combination Product in such country; (3) if, on a country-by-country basis, a Product is not sold separately, Global Net Sales in such country for the purpose of determining royalty payments on Global Net Sales of the Combination Product shall be calculated by multiplying the actual Global Net Sales of such Combination Product by the fraction (C-B)/C, where B is the weighted average gross sales price in such country of the Other Components, if sold separately in such country, and C is the weighted average gross sales price in such country of the Combination Product; or (4) if, on a country-by-country basis, neither a Product nor the Other Components are sold separately in such country, Global Net Sales of the Combination Product in such country for the purposes of determining royalty payments on such Global Net Sales of such Combination Product shall be determined by the Borrower based on the relative fair market value of such Product and Other Components, taking into account the medical contribution to the Other Components, and all other factors reasonably relevant to the relative value of, the Product, on the one hand, and all of the Other Components as applicable, collectively, on the other hand.

"Governmental Authority" means any federal, state, municipal, national or other government, governmental department, commission, board, bureau, court, agency or instrumentality or political subdivision thereof or any entity or officer exercising executive, legislative, judicial, taxing, regulatory or administrative functions of or pertaining to any government or any court, including any patent office, in each case whether associated with a state of the United States, the United States or a foreign entity or government.

"Governmental Authorization" means any permit, license, authorization, clearance, approval, Registration, plan, directive, administrative order, consent order or consent decree of or from any Governmental Authority.

"Grantor" has the meaning specified in the Pledge and Security Agreement.

"GSK4532990" means the pharmaceutical product candidate having the chemical structure set forth on Schedule 1.1(a), including all forms (including salt forms), presentations, strengths, doses, and formulations (including any method of delivery), either alone or as a Combination Product, and all other "Products" (as defined in the GSK4532990 License Agreement) licensed or sublicensed to one or more third parties under the GSK4532990 License Agreement.

"GSK4532990 License Agreement" means that certain Exclusive License Agreement by and between Arrowhead Pharmaceuticals, Inc. and GlaxoSmithKline Intellectual Property (No. 3) Limited dated as of November 22, 2021.

"Guaranteed Obligations" has the meaning specified in Section 7.1.

"Guarantor" means each Subsidiary of Borrower and each other Person which guarantees, pursuant to Article VII or otherwise, all or any part of the Obligations. For the avoidance of doubt, no Excluded Subsidiary shall be a Guarantor except at the election of Borrower in accordance with Section 5.10.

"Guarantor Subsidiary" means each Guarantor.

"Guaranty" means (a) the guaranty of each Guarantor set forth in Article VII and (b) each other guaranty, in form and substance satisfactory to Administrative Agent, made by any other Guarantor for the benefit of the Secured Parties guaranteeing all or part of the Obligations.

"Hazardous Materials" means, regardless of amount or quantity, (a) any element, compound or chemical that is defined, listed or otherwise classified as a contaminant, pollutant, toxic pollutant, toxic or hazardous substance, extremely hazardous substance or chemical, hazardous waste, special waste, or solid waste under Environmental Laws or that is likely to cause immediately, or at some future time, harm to or have an adverse effect on, the environment or risk to human health or safety, including, without limitation, any pollutant, contaminant, waste, hazardous waste, toxic substance or dangerous good which is defined or identified in any Environmental Law and which is present in the environment in such quantity or state that it contravenes any Environmental Law, (b) petroleum and its refined products, (c) polychlorinated biphenyls, (d) any substance exhibiting a hazardous waste characteristic, including, without limitation, corrosivity, ignitability, toxicity or reactivity as well as any radioactive or explosive materials, (e) any raw materials, building components (including, without limitation, asbestos-containing materials) and manufactured products containing hazardous substances listed or classified as such under Environmental Laws, and (f) any substance or materials that are otherwise regulated under Environmental Law.

"Hazardous Materials Activity" means any past, current, proposed or threatened activity, event or occurrence involving any Hazardous Materials, including the use, manufacture, possession, storage, holding, presence, existence, location, Release, threatened Release, discharge, placement, generation, transportation, processing, construction, treatment, abatement, removal, remediation, disposal, disposition or handling of any Hazardous Materials, and any corrective action or response action with respect to any of the foregoing.

"Hedging Agreement" means any interest or foreign exchange rate swap agreement, interest rate or foreign exchange cap agreement, interest rate or foreign exchange collar agreement, interest rate or foreign exchange hedging agreement or other similar agreement or arrangement, each of which is (a) for the purpose of hedging the interest rate exposure or foreign exchange exposure associated with Borrower's and its Subsidiaries' operations, and (b) not for speculative purposes.

"Highest Lawful Rate" means the maximum lawful interest rate, if any, that at any time or from time to time may be contracted for, charged, or received under the laws applicable to any Lender which are presently in effect or, to the extent allowed by law, under such applicable laws which may hereafter be in effect and which allow a higher maximum non-usurious interest rate than applicable laws now allow.

"Historical Financial Statements" means as of the Closing Date, (a) the audited financial statements of Borrower and its Subsidiaries, for the Fiscal Year ended September 30, 2023, consisting of balance sheets and the related consolidated statements of income, stockholders' equity and cash flows for such Fiscal Year, and (b) the financial statements of Borrower and its Subsidiaries for the Fiscal Quarter ended March 31, 2024, consisting of balance sheets and the related consolidated statements of income, stockholders' equity and cash flows for such Fiscal Quarter.

"Immaterial Subsidiary" means a Subsidiary of the Borrower described in clause (e) of the definition of Excluded Subsidiary.

"Increased Cost Lenders" has the meaning specified in Section 2.18.

"Incremental Term Loans" means the Term Loans funded after the Closing Date pursuant to Section 2.1(a)(iii).

"Indebtedness" means, as applied to any Person, without duplication, (a) all indebtedness for borrowed money, (b) that portion of obligations with respect to Capital Leases that is properly classified as a liability on a balance sheet in conformity with GAAP, (c) all obligations of such Person evidenced by notes, bonds or similar instruments or upon which interest payments are customarily paid and all obligations

in respect of notes payable and drafts accepted representing extensions of credit whether or not representing obligations for borrowed money, (d) any obligation owed for all or any part of the deferred purchase price of property or services, including any earn-outs or other deferred payment obligations in connection with an acquisition to the extent such earn-outs and deferred payment obligations are fixed and non-contingent (excluding any such obligations incurred under ERISA and excluding trade payables incurred in the ordinary course of business and repayable in accordance with customary trade terms), (e) all obligations created or arising under any conditional sale or other title retention agreement with respect to property acquired by such Person, (f) all indebtedness secured by any Lien on any property or asset owned or held by that Person regardless of whether the indebtedness secured thereby shall have been assumed by that Person or is non-recourse to the credit of that Person, (g) the face amount of any letter of credit or letter of guaranty issued, bankers' acceptances facilities, surety bonds and similar credit transactions issued for the account of that Person or as to which that Person is otherwise liable for reimbursement of drawings, (h) the direct or indirect guaranty, endorsement (otherwise than for collection or deposit in the ordinary course of business), co-making, discounting with recourse or sale with recourse by such Person of the obligation of another, (i) any obligation of such Person the primary purpose or intent of which is to provide assurance to an obligee that the obligation of the obligor thereof will be paid or discharged, or any agreement relating thereto will be complied with, or the holders thereof will be protected (in whole or in part) against loss in respect thereof, (j) any liability of such Person for an obligation of another through any agreement (contingent or otherwise) (i) to purchase, repurchase or otherwise acquire such obligation or any security therefor, or to provide funds for the payment or discharge of such obligation (whether in the form of loans, advances, stock purchases, capital contributions or otherwise) or (ii) to maintain the solvency or any balance sheet item, level of income or financial condition of another if, in the case of any agreement described under subclauses (i) or (ii) of this clause (j), the primary purpose or intent thereof is as described in clause (i) above, (k) all obligations of such Person in respect of any exchange traded or over the counter derivative transaction, including, without limitation, any Hedging Agreement, whether entered into for hedging or speculative purposes, (l) Disqualified Capital Stock, and (m) any Royalty Monetization Transaction. The Indebtedness of any Person shall include the Indebtedness of any partnership or joint venture in which such Person is a general partner or joint venturer, unless such Indebtedness is expressly non-recourse to such Person. Notwithstanding anything herein to the contrary, Indebtedness shall not include (i) prepaid or deferred revenue arising in the ordinary course of business, (ii) endorsements of checks or drafts arising in the ordinary course of business, (iii) Capital Stock to the extent not constituting Disqualified Capital Stock, (iv) any obligations in respect of any Permitted Equity Derivative, (v) deferred compensation and severance, pension, health and welfare retirement and equivalent benefits or any deferred obligations incurred under ERISA until such obligations become a liability on the balance sheet of such Person in accordance with GAAP, (vi) purchase price adjustments or earn outs or other contingent payments of a similar nature (including any non-compete payments and consulting payments) made in connection with any Investment or other acquisitions permitted hereunder, in each case, to the extent such obligations have not become due and payable (provided that deferred payments that are fixed or not subject to a bona fide contingency shall constitute Indebtedness to the extent provided in clause (d) above), (vii) non-compete or consulting obligations incurred in connection with Investments or other acquisitions until such obligations become a liability on the balance sheet of such Person in accordance with GAAP, (viii) unsecured installment payments or the deferred purchase price of property or services to the extent payable solely in Qualified Capital Stock of such Person, and (ix) purchase price holdbacks arising in the ordinary course of business in respect of a portion of the purchase price of an asset to satisfy unperformed obligations of the seller of such asset.

"Indemnified Liabilities" means, collectively, any and all liabilities (including Environmental Liabilities and Costs), obligations, losses, damages (including natural resource damages), fines, penalties, claims (including Environmental Claims), costs (including the costs of any investigation, study, sampling, testing, monitoring, abatement, cleanup, removal, remediation or other response or corrective action necessary to remove, remediate, clean up, abate or otherwise address any Hazardous Materials Activity),

expenses and disbursements of any kind or nature whatsoever (including the reasonable and documented out-of-pocket fees and disbursements of counsel for Indemnitees in connection with any investigative, administrative or judicial proceeding commenced or threatened by any Person, whether or not any such Indemnitee shall be designated as a party or a potential party thereto, and any fees or expenses incurred by Indemnitees in enforcing this indemnity), whether direct, indirect or consequential and whether based on any federal, state or foreign laws, statutes, rules or regulations (including securities and commercial laws, statutes, rules or regulations and Environmental Laws), on common law or equitable cause or on contract or otherwise, that may be imposed on, incurred by, or asserted in writing against any such Indemnitee, in any manner relating to or arising out of (a) this Agreement or the other Loan Documents or the transactions contemplated hereby or thereby (including the Lenders' agreement to make Credit Extensions or the use or intended use of the proceeds thereof, or any enforcement of any of the Loan Documents (including any sale of, collection from, or other realization upon any of the Collateral or the enforcement of the Guaranty)), (b) the statements contained in the proposal letter delivered by any Lender to Company prior to the Closing Date with respect to the transactions contemplated by this Agreement, or (c) any Environmental Claim or any Hazardous Materials Activity relating to or arising from, directly or indirectly, any past or present activity, operation, land ownership, or practice of Borrower or any of its Subsidiaries.

"Indemnified Taxes" means (a) Taxes, other than Excluded Taxes, imposed on or with respect to any payment made by or on account of any obligation of any Loan Party under any Loan Document and (b) to the extent not otherwise described in clause (a), Other Taxes.

"Indemnitee" has the meaning specified in Section 10.3.

"Indemnitee Agent Party" has the meaning specified in Section 9.6.

"Initial Delayed Draw Term Loan" means the Term Loans funded after the Closing Date pursuant to Section 2.1(a)(ii).

"Initial Term Loan" means the Term Loan funded on the Closing Date pursuant to Section 2.1(a)(i).

"Initial Term Loan Commitment" means the commitment of a Lender to make or otherwise fund the Initial Term Loan and "Initial Term Loan Commitments" means such commitments of all such Lenders in the aggregate. The amount of each Lender's Initial Term Loan Commitment is set forth on Appendix A-1 or in the applicable Assignment Agreement, subject to any adjustment or reduction pursuant to the terms and conditions hereof. The aggregate amount of the Initial Term Loan Commitment as of the Closing Date is $400,000,000.

"Insolvency Proceeding" means any proceeding commenced by or against any Person under any provision of any Debtor Relief Law.

"Intellectual Property" has the meaning specified in the Pledge and Security Agreement.

"Intellectual Property Rights" means any and all rights, title and interests in and to all intellectual property rights of every kind and nature however denominated, as they exist throughout the world, including

(a) any Patent;

(b) trademarks, trade names, service marks, brands, trade dress and logos, packaging design, slogans, domain names and the goodwill and activities associated therewith (collectively, "Trademarks");

(c) copyrights, mask work rights, confidential information, trade secrets, database rights, including all compilations, databases and computer programs, manuals and other documentation, and all derivatives, translations, adaptations, and combinations of the above (collectively, "Copyrights");

(d) Know-How;

(e) rights of publicity, and moral rights; and

(f) any and all other intellectual property rights or proprietary rights, whether or not patentable, including any and all registrations, applications, recordings, licenses, common-law rights, statutory rights, administrative rights, and contractual rights relating to any of the foregoing, claims of infringement and misappropriation against third parties, and regulatory filings, submissions and approvals.

"Intercompany Subordination Agreement" means that certain Intercompany Subordination Agreement, dated as of the Closing Date, made by the Loan Parties and their Subsidiaries in favor of Administrative Agent for the benefit of the Secured Parties in form and substance reasonably satisfactory to Administrative Agent, as amended, amended and restated, supplemented or otherwise modified from time to time.

"Interest Payment Date" means (a) the last Business Day of each Fiscal Quarter, commencing on the first such date to occur after the Closing Date and (b) the final maturity date of the Loans (whether by scheduled maturity, acceleration or otherwise).

"Internal Revenue Code" means the United States Internal Revenue Code of 1986, as amended.

"Investment" means (a) any direct or indirect purchase or other acquisition by Borrower or any of its Subsidiaries of, or of a beneficial interest in, any of the securities or Capital Stock or all or substantially all of the assets of any other Person (or of any product, division, product line or business line of such other Person), (b) any direct or indirect redemption, retirement, purchase or other acquisition for value, by any Subsidiary of Borrower from any Person, of any Capital Stock of such Person, (c) any direct or indirect loan, advance, or capital contributions (or transfer or similar payment made from one entity to its Subsidiary in lieu of any capital contributions that would otherwise be required) by Borrower or any of its Subsidiaries to any other Person, including all indebtedness (including, without limitation, any intercompany indebtedness) and accounts receivable from that other Person that are not current assets or did not arise from sales to that other Person in the ordinary course of business, and (d) any direct or indirect guarantee of any obligations of any other Person. The amount of any Investment shall be (i) the original cost of such Investment plus the cost of all additions thereto, without any adjustments for increases or decreases in value, or write ups, write downs or write offs with respect to such Investment; minus (ii) the amount of dividends or distributions actually received in connection with such Investment and any return of capital and any payment of principal received in respect of such Investment that in each case is received in cash or Cash Equivalents (not in excess of the amount of Investments originally made).

"Joint Venture" means a joint venture, partnership or other similar arrangement, whether in corporate, partnership or other legal form in which the Borrower or any of its Subsidiaries holds any Capital Stock; provided, in no event shall any corporate Subsidiary of any Person be considered to be a Joint Venture to which such Person is a party. On the Closing Date, the only Joint Venture is Visirna.

"Joint Venture Proceeds" means any and all proceeds payable to Borrower or any of its Subsidiaries pursuant to a Joint Venture, including but not limited to dividends, whether paid in cash, equity or any other form of consideration; provided, that, any amounts payable in respect of the research, development,

manufacture and/or Commercialization of any Partnered Asset shall be treated as Royalties, Milestones, or Profit Share Amounts (as the case may be) in respect of such Partnered Asset.

"Junior Debt" has the meaning assigned to such term in the definition of Restricted Junior Payment.

"Know-How" means all information and materials, including but not limited to discoveries, improvements, processes, methods, protocols, formulations formulas, data (including pharmacological, toxicological, non-clinical data, clinical data, analytical and quality control data, manufacturing data and descriptions, market data, financial data or descriptions), inventions, devices, assays, chemical formulations, specifications, product samples and other samples, physical, practices, procedures, technology, techniques, designs, drawings, correspondence, computer programs, documents, apparatus, results, strategies, Regulatory Documentation, information and submissions pertaining to, or made in association with, filings with any Governmental Authority, research in progress, algorithms, data, databases, data collections, chemical and biological materials (including any compounds, DNA, RNA, clones, vectors, cells and any expression product, progeny, derivatives or improvements thereto), and the results of experimentation and testing, including samples in each case, knowledge, know-how, trade secrets and the like, in written, electronic, oral or other tangible or intangible form, patentable or otherwise, which are not generally known.

"Lender" means each lender listed on the signature pages hereto as a Lender, and any other Person that becomes a party hereto pursuant to an Assignment Agreement other than any Person that ceases to be a party hereto pursuant to any Assignment Agreement.

"Liabilities" means all claims, actions, suits, judgments, damages, losses, liability, obligations, responsibilities, fines, penalties, sanctions, costs, fees, taxes, commissions, charges, disbursements and expenses, in each case of any kind or nature (including interest accrued thereon or as a result thereto and fees, charges and disbursements of financial, legal and other advisors and consultants), whether joint or several, whether or not indirect, contingent, consequential, actual, punitive, treble or otherwise.

"License Agreements" has the meaning set forth in Section 4.23(b).

"Licensee" means any third party to which Company, any of its Subsidiaries, or any of their respective licensees, directly or indirectly through multiple tiers, grants a license, a sublicense, or other right to develop, manufacture or Commercialize a Product in any jurisdiction.

"Lien" means (a) any lien, mortgage, pledge, assignment, hypothec, deed of trust, security interest, license or sublicense, charge or encumbrance of any kind (including any agreement to give any of the foregoing, any conditional sale or other title retention agreement, and any lease in the nature thereof) and any option, trust or other preferential arrangement having the practical effect of any of the foregoing, and (b) in the case of securities or Capital Stock, any purchase option, call or similar right of a third party with respect to such securities or Capital Stock.

"Loan" means any Term Loan.

"Loan Account" means an account maintained hereunder by Administrative Agent on its books of account at the Payment Office, and with respect to Company, in which it will be charged with the Term Loan made to, and all other Obligations incurred by the Loan Parties.

"Loan Document" means any of this Agreement, the Notes, if any, the Collateral Documents, the Fee Letter, the Flow of Funds Agreement, any Guaranty, the Intercompany Subordination Agreement, the Perfection Certificate, any intercreditor agreement executed pursuant to Section 9.8(a)(ii)(A), and all other

documents, instruments or agreements executed and delivered by a Loan Party for the benefit of Administrative Agent or any Lender in connection herewith.

"Loan Party" means Company or any Guarantor.

"Loan Party Partner" has the meaning set forth in Section 4.33(a).

"Margin Stock" has the meaning specified in Regulation U of the Board of Governors of the Federal Reserve System as in effect from time to time.

"Market Capitalization Milestone" means the Company achieves an aggregate market capitalization of the Company (based on the closing price of the Common Stock on the date of such calculation) of greater than (i) $[**] for the purposes of the definition of Permitted Acquisition and Section 2.10(f) of this Agreement and (ii) $[**] for purposes of the definition of Required Milestone Cash Amount.

"Material Adverse Effect" means a material adverse effect with respect to (a) the business operations, properties, assets, financial condition, or liabilities of Borrower and its Subsidiaries taken as a whole, (b) the ability of any Loan Party to fully and timely perform its obligations under any Loan Document to which it is a party, (c) the legality, validity, binding effect, or enforceability against a Loan Party of a Loan Document to which it is a party, (d) the validity, perfection or priority of Administrative Agent's Liens on the Collateral or (e) the rights, remedies and benefits available to, or conferred upon, Administrative Agent and any Lender or any other Secured Party under any Loan Document.

"Material Contract" means (a) any contract or other arrangement to which Borrower or any of its Subsidiaries is a party (other than the Loan Documents) for which breach, non-performance, cancellation or failure to renew could reasonably be expected to have a Material Adverse Effect and (b) those contracts and arrangements listed on Schedule 4.15 with respect to Material Products.

"Material Product" means [**].

"Material Real Property" means (i) the fee-owned real property that is located at the Verona Technology Park at 1080 Arrowhead Way, Verona, Wisconsin 53593 (the "Wisconsin Facility") and (ii) any other fee-owned real property that is owned by any Loan Party with a fair market value in excess of $[**] (at the time of acquisition, as reasonably estimated by the Borrower in good faith).

"Material Regulatory Liabilities" means (a) any Liabilities arising from the violation of FDA Laws, Public Health Laws, Federal Health Care Program Laws, or other applicable comparable Requirements of Law, or the terms, conditions of or requirements applicable to any Registrations (including costs of actions required under applicable Requirements of Law, including FDA Laws and Federal Health Care Program Laws, or necessary to remedy any violation of any terms or conditions applicable to any Registrations), including, but not limited to, withdrawal of approval, revocation, or suspension of a Governmental Authorization for, or recall, import detention, or seizure of, any Product, and (b) any loss of recurring annual revenues as a result of any loss, suspension or limitation of any Registrations, which, in the case of the foregoing clauses (a) and (b), (i) exceeds $[**] individually or in the aggregate or (ii) would reasonably be expected to result in a Material Adverse Effect.

"Material Subsidiary" means a Subsidiary of the Borrower other than an Immaterial Subsidiary.

"Milestones" means, with respect to any Product and Platform Technology, (i) any and all milestone payments received by or on behalf of Borrower or any of its Subsidiaries under any Permitted

Product Agreement or pursuant to any Royalty Monetization Transaction in respect of such Product or Platform Technology (including but not limited to research milestones, development milestones, commercialization milestones, milestones payable on the First Commercial Sale of a Product, and purchase price milestones (including the RPI Milestones)), (ii) any and all payments received by or on behalf of Borrower or any of its Subsidiaries in lieu of such payments described in the foregoing clause (i), (iii) any and all interest payments received by Borrower or any of its Subsidiaries assessed on any payments described in the foregoing clauses (i) and (ii), and (iv) without duplication of any payment actually made under clauses (i), (ii) and (iii), any and all "proceeds" recoverable or recovered with respect to any of the foregoing.

"MOIC" has the meaning specified in the Fee Letter.

"Monetized Territory" has the meaning set forth in the definition of "Pipeline Asset Monetization".

"Moody's" means Moody's Investor Services, Inc.

"Mortgage" means a mortgage, deed of trust or deed to secure debt that encumbers Real Property, in form and substance satisfactory to Administrative Agent, made by a Loan Party in favor of Administrative Agent for the benefit of the Secured Parties, securing the Obligations and delivered to Administrative Agent.

"Mortgage Deliverables" has the meaning specified in Section 5.11.

"Multiemployer Plan" means any Employee Benefit Plan which is a "multiemployer plan" as defined in Section 3(37) of ERISA.

"Narrative Reports" means, with respect to the financial statements for which such narrative report is required, (a) a customary management discussion and analysis report in a customary form for the Borrower for the applicable fiscal quarter or fiscal year and for the period from the beginning of the then-current fiscal year to the end of the period to which the relevant financial statements relate and (b) a narrative report, in a form to be mutually agreed by Borrower and Administrative Agent and which is intended to provide the following information (i) Company's material clinical development activities involving any Products (other than Partnered Assets), including the timing/enrollment, material changes to design and latest estimate for completion for such clinical development programs, (ii) any Products (other than Partnered Assets) Commercialized by the Company, monthly units, ASP and net sales by country, and (iii) any reports summarizing development or commercialization activities received by the Borrower or any of its Subsidiaries in connection with any Joint Ventures or from Licensees with respect to their respective Partnered Assets.

"Net Proceeds" means (a) with respect to any Asset Sale, an amount equal to: (i) Cash payments received by or on behalf of Borrower or any of its Subsidiaries from such Asset Sale (including, in the case of any Permitted Product Agreement, any up-front payments, Royalties, Milestones, Joint Venture Proceeds, Profit Share Amounts and other similar payments), minus (ii) any bona fide costs or expenses incurred in connection with such Asset Sale that are properly attributable to such Asset Sale and to the extent paid or payable to non-Affiliates, including (A) income or gains Taxes paid or reasonably estimated to be payable in connection therewith, (B) payment of the outstanding principal amount of, premium or penalty, if any, and interest on any Indebtedness (other than the Loans) that is secured by a Lien on the stock or assets in question and that is required to be repaid under the terms thereof as a result of such Asset Sale, (C) a reasonable reserve for any indemnification payments (fixed or contingent) attributable to seller's indemnities and representations and warranties to purchaser in respect of such Asset Sale undertaken by Borrower or any of its Subsidiaries in connection with such Asset Sale and (D) any reasonable and

documented out-of-pocket fees or expenses incurred in connection therewith; provided that upon release of any such reserve, the amount released shall be considered Net Proceeds, provided further that any Asset Sale comprising a Permitted Product Agreement shall not be subject to the deductions set forth in this subsection (ii), and (b) with respect to any insurance, condemnation, taking or other casualty proceeds, an amount equal to: (i) any Cash payments or proceeds received by Borrower or any of its Subsidiaries (A) under any casualty, business interruption or "key man" insurance policies in respect of any covered loss thereunder, or (B) as a result of the condemnation or taking of any assets of Borrower or any of its Subsidiaries by any Person pursuant to the power of eminent domain, condemnation or otherwise, or pursuant to a sale of any such assets to a purchaser with such power under threat of such a taking, minus (ii) (A) any actual costs or expenses incurred by Borrower or any of its Subsidiaries in connection with the adjustment or settlement of any claims of Borrower or such Subsidiary in respect thereof, and (B) any bona fide costs and expenses incurred in connection with any sale of such assets as referred to in clause (b)(i)(B) of this definition to the extent paid or payable to non-Affiliates, including income taxes payable as a result of any gain recognized in connection therewith.

"New License Agreement" has the meaning set forth in Section 5.12(c).

"NIH" has the meaning specified in the definition of Public Health Laws.

"Non-Core Markets" means any country or jurisdiction that is not a Core Market.

"Note" means a promissory note evidencing the Initial Term Loan or a Delayed Draw Term Loan, as applicable.

"Notice" means a Funding Notice.

"Obligations" means all obligations of every nature of each Loan Party and its Subsidiaries from time to time owed to Administrative Agent (including former Administrative Agents), the Lenders or any of them, in each case, under any Loan Document, whether for principal, interest (including interest which, but for the filing of a petition in bankruptcy with respect to such Loan Party, would have accrued on any Obligation, whether or not a claim is allowed against such Loan Party for such interest in the related bankruptcy proceeding), any Yield Maintenance Premium, any MOIC, fees, expenses, indemnification or otherwise and whether primary, secondary, direct, indirect, contingent, fixed or otherwise (including obligations of performance).

"OFAC" has the meaning specified in the definition of "Anti-Terrorism Laws".

"OFAC Sanctions Programs" means (a) the Requirements of Law and Executive Orders administered by OFAC, including but not limited to, Executive Order No. 13224, and (b) the list of Specially Designated Nationals and Blocked Persons administered by OFAC, in each case, as renewed, extended, amended, or replaced.

"Olpasiran" means the pharmaceutical product candidate having the chemical structure set forth on Schedule 1.1(a), including all forms, presentations, strengths, doses, and formulations (including any method of delivery), either alone or as a Combination Product, and all other "Licensed Products" (as defined in the Olpasiran License Agreement) licensed or sublicensed to one or more third parties under the Olpasiran License Agreement.

"Olpasiran License Agreement" means that certain Second Collaboration and License Agreement by and between Amgen Inc. and Arrowhead Pharmaceuticals, Inc. dated as of September 28, 2016.

"Orange Book" means the FDA publication "Approved Drug Products with Therapeutic Equivalence Evaluations," which identifies drug products approved by the FDA under the Federal Food, Drug, and Cosmetic Act as well as patent and exclusivity information related to approved drug products, as may be amended from time to time.

"Orange Book Patent" means any Product Patents issued in the U.S. and listed in Orange Book pursuant to 21 U.S.C. Section 355(b)(1), as such patent listing may be amended from time to time, together with all foreign counterpart patents.

"Organizational Documents" means (a) with respect to any corporation or company, its certificate, articles or memorandum of incorporation, organization or association, and its by-laws, (b) with respect to any limited partnership, its certificate of limited partnership, and its partnership agreement, (c) with respect to any general partnership, its partnership agreement, and (d) with respect to any limited liability company, its articles of organization, and its operating agreement (or, in each case of (a) through (d), the equivalent or comparable constitutive documents with respect to any non-U.S. jurisdiction). In the event any term or condition of this Agreement or any other Loan Document requires any Organizational Document to be certified by a secretary of state or similar governmental official, the reference to any such "Organizational Document" shall only be to a document of a type customarily certified by such governmental official.

"Other Connection Taxes" has the meaning specified in Section 2.15(a).

"Other Taxes" has the meaning specified in Section 2.15(a).

"Outbound License Agreement" means, individually or collectively as the context requires, the agreements listed in Items 1 through and including 5 of Schedule 4.23(b)(ii).

"Participant Register" has the meaning specified in Section 10.6(h)(ii).

"Partnered Assets" means (a) [**], (b) [**], and (c) any Products that are the subject of any Specified Transaction after such Specified Transaction is entered into.

"Patent" means any patent or patent application, including any continuation, continuation-in-part, division, provisional or any substitute applications, any patent issued with respect to any of the foregoing patent applications, any certificate, reissue, reexamination, renewal or patent term extension or adjustment (including any supplementary protection certificate) of any such patent or other governmental actions which extend the duration or any of the subject matter of a patent, and any substitution patent, confirmation patent or registration patent or patent of addition based on any such patent, and all foreign counterparts of any of the foregoing.

"PATRIOT Act" has the meaning specified in Section 4.29.

"Payment Office" means Administrative Agent's office located at 2100 McKinney Avenue, Suite 1500, Dallas, Texas 75201 or such other office or offices of Administrative Agent as may be designated in writing from time to time by Administrative Agent and Company.

"PBGC" means the Pension Benefit Guaranty Corporation or any successor thereto.

"Pension Plan" means any Employee Benefit Plan, other than a Multiemployer Plan, which is subject to Section 412 of the Internal Revenue Code, Section 302 of ERISA or Title IV of ERISA.

"Perfection Certificate" means that certain Perfection Certificate, dated as of the Closing Date.

"Permitted Acquisition" means any acquisition by Company or its wholly owned Subsidiaries, whether by purchase, merger, in-licensing or otherwise, of all or substantially all of the assets of, all of the Capital Stock of, or a business line or unit or a division of, or Patents, or similar or related Intellectual Property rights of, any Person; provided,

(a) immediately prior to, and after giving effect thereto, no Default or Event of Default shall have occurred and be continuing or would result therefrom;

(b) all transactions in connection therewith shall be consummated, in all material respects, in accordance with all applicable laws and in conformity with all applicable and material Governmental Authorizations;

(c) in the case of the acquisition of Capital Stock, all of the Capital Stock (except for any such securities in the nature of directors' qualifying shares required pursuant to applicable law) acquired or otherwise issued by such Person or any newly formed Guarantor Subsidiary in connection with such acquisition shall be owned [**]% by a Loan Party, and Company shall have taken, or caused to be taken, as of the date such Person becomes a Subsidiary, each of the actions required to be taken as of such date as set forth in Section 5.10, Section 5.11 and/or Section 5.12, as applicable;

(d) Borrower and its Subsidiaries shall be in compliance with the covenant set forth in Section 6.8 on a pro forma basis after giving effect to such acquisition as of the last day of the Fiscal Quarter most recently ended;

(e) to the extent the Market Capitalization Milestone is not satisfied, in the case of an acquisition with total consideration in excess of $[**], and solely to the extent reasonably available to the Company, the Company shall have delivered to Administrative Agent at least [**] (or such shorter period as agreed to by Administrative Agent in writing) prior to such proposed acquisition such information and documents that Administrative Agent may reasonably request, including, without limitation, financial information with respect to such acquired assets, to the extent such financial information is available, and drafts of the respective acquisition agreements related thereto;

(f) any Person or assets or division as acquired in such Permitted Acquisition shall be in the same business or lines of business in which Company and/or its Subsidiaries are engaged as of the Closing Date (or in lines of business reasonably related or incidental thereto, or such other lines of business as may be consented to by Administrative Agent (such consent not to be unreasonably withheld or delayed));

(g) the acquisition shall have been approved by the Board of Directors or other governing body or controlling Person of the Person acquired or the Person from whom such assets or division is acquired or a court of competent jurisdiction; and

(h) the assets being acquired (other than a de minimis amount of assets in relation to the assets being acquired) are located within [**] or the Person whose Equity Interests are being acquired is organized in a jurisdiction located within [**];

(i) the total consideration (excluding any portion thereof paid with Common Stock of the Company or with proceeds of a substantially concurrent (and in no event more than [**] before or after such acquisition) issuance of Common Stock) paid or payable in connection with (x) an individual acquisition shall not exceed $[**] and (y) all such acquisitions consummated since the Closing Date shall not exceed $[**]; and

(j) all such assets so acquired shall be subject to the mandatory prepayment obligations set forth in Section 2.10(h) and Section 2.10(i).

"Permitted Convertible Indebtedness" means any Indebtedness of Borrower that is convertible based on a fixed conversion rate (subject to customary anti-dilution adjustments, "make-whole" increases and other customary changes thereto) into shares of Common Stock of Borrower (or other securities or property following a merger event or other change of the Common Stock of Borrower), cash or any combination thereof (with the amount of such cash or such combination determined by reference to the market price of such Common Stock or such other securities); provided that (a) at the time such Indebtedness is incurred, no Default or Event of Default has occurred and is continuing or would occur as a result of such incurrence, (b) all necessary corporate, company, shareholder or similar actions shall be taken and consents obtained in connection with the issuance of such Indebtedness, (c) the issuance of such Indebtedness shall be consummated in compliance with all applicable Requirements of Law, and (d) the documentation evidencing such Indebtedness shall have been delivered to Administrative Agent and shall be on customary terms for similar convertible transactions in the public markets (as determined by Borrower in good faith) but in all cases including all of the following terms: (i) it shall not have a cash pay interest rate that exceeds [**]% per annum, (ii) it shall be (and shall remain at all times) unsecured to the Obligations, (iii) it shall not have a maturity (and shall not have any scheduled amortization of principal) prior to the date that is [**] after the Term Loan Maturity Date in effect at the time such Indebtedness is incurred, (iv) if it has any negative covenants, such covenants (including covenants relating to incurrence of Indebtedness), shall not be more restrictive than those set forth herein, (v) it shall have no restrictions on Borrower's or its Subsidiaries' ability to grant liens securing the Obligations, (vi) it shall not prohibit the incurrence of the Obligations, (vii) it is not guaranteed by any Subsidiary and (viii) any cross-default or cross-acceleration event of default (each howsoever defined) provision contained therein that relates to indebtedness or other payment obligations of the Company (or any of its Subsidiaries) (such indebtedness or other payment obligations a "Cross-Default Reference Obligation") contains a cure period of at least [**] (after written notice to the issuer of such Indebtedness by the trustee or to such issuer and such trustee by holders of at least [**]% (or any other applicable percentage) in the aggregate principal amount of such Indebtedness then outstanding) before a default, event of default, acceleration or other event or condition under such Cross-Default Reference Obligation results in an event of default under such cross-default or cross-acceleration provision.

"Permitted Equity Derivative" means any forward purchase, accelerated share repurchase, call option, warrant or other derivative transactions in respect of Borrower's Common Stock; provided, that (w) the terms, conditions and covenants of each such transaction shall be customary for transactions of such type, as determined by Borrower in good faith, (x) such transaction may, at the option of Borrower, be settled in Common Stock of Borrower, (y) such transaction is entered into contemporaneously and otherwise in connection with the issuance of Permitted Convertible Indebtedness or the Restricted Junior Payments in respect of such transaction are otherwise permitted pursuant to Section 6.5(f), and (z) such transaction shall be classified in Borrower's stockholders' equity under FASB ASC 815-40 or any successor provision.

"Permitted Fazirsiran Reduction" means [**].

"Permitted Indebtedness" means:

(a) the Obligations;

(b) to the extent constituting Indebtedness, Permitted Intercompany Investments; provided, that such Indebtedness shall be unsecured and, to the extent such Indebtedness is owed by a Loan Party to a Subsidiary that is not a Loan Party, the parties thereto are party to an Intercompany Subordination Agreement;

(c) Indebtedness incurred by Borrower or any of its Subsidiaries arising from agreements providing for indemnification or from guaranties or letters of credit, surety bonds or performance bonds securing the performance of Company or any such Subsidiary pursuant to such agreements, in connection with Permitted Acquisitions or Asset Sales permitted hereunder;

(d) Indebtedness which may be deemed to exist pursuant to any guaranties, performance, surety, statutory, appeal or similar obligations incurred in the ordinary course of business and Indebtedness constituting guaranties in the ordinary course of business of the obligations of suppliers, customers, franchisees and licensees of Borrower and its Subsidiaries;

(e) Indebtedness incurred in the ordinary course of business in connection with workers' compensation, unemployment insurance and other types of social security, or to secure the performance of tenders, statutory obligations, surety and appeal bonds, bids, leases, government contracts, trade contracts, performance and return of money bonds and other similar obligations;

(f) (i) Indebtedness in respect of netting services, overdraft protections and otherwise in connection with deposit accounts; and (ii) Indebtedness arising from the honoring by a bank or other financial institution of a check, draft or similar instrument inadvertently (except in the case of daylight overdrafts) drawn against insufficient funds in the ordinary course of business; provided, however, that such Indebtedness is extinguished within [**] of incurrence;

(g) Indebtedness described in Schedule 6.1, and any Permitted Refinancing Indebtedness in respect of such Indebtedness;

(h) Indebtedness in an aggregate amount outstanding not to exceed at any time, together with the aggregate amount of Indebtedness incurred pursuant to clause (m) below, $[**] with respect to (i) Capital Leases and (ii) purchase money Indebtedness (including any Indebtedness acquired in connection with a Permitted Acquisition); provided that any such Indebtedness shall be secured only by the asset subject to such Capital Lease or by the asset acquired in connection with the incurrence of such Indebtedness;

(i) guaranties with respect to Indebtedness of Borrower or any of its Subsidiaries, to the extent that the Person that is obligated under such guaranty could have incurred such underlying Indebtedness to the extent such guaranties are not prohibited by Section 6.7; provided that, if the Indebtedness being guaranteed is subordinated to the Obligations, such guaranty shall be subordinated to the Obligations on terms at least as favorable to the Secured Parties as those contained in the subordination of such Indebtedness;

(j) unsecured Indebtedness of Borrower owing to former employees, officers, or directors (or any spouses, ex-spouses, or estates of any of the foregoing) incurred in connection with the repurchase by Borrower of the Capital Stock of Borrower that has been issued to such Persons, so long as (i) no Default or Event of Default has occurred and is continuing or would result from the incurrence of such Indebtedness, (ii) the aggregate outstanding principal amount of all such Indebtedness incurred

pursuant to this clause (j) does not exceed $[**], and (iii) such Indebtedness is subordinated to the Obligations on terms and conditions reasonably acceptable to Administrative Agent;

(k) Indebtedness owed to any Person providing property, casualty, liability, or other insurance to the Loan Parties, so long as the amount of such Indebtedness is not in excess of the amount of the unpaid cost of, and shall be incurred only to defer the cost of, such insurance for the period in which such Indebtedness is incurred and such Indebtedness is outstanding only during such period;

(l) contingent liabilities in respect of any indemnification obligation, adjustment of purchase price, deferred purchase price and compensation, or other similar arrangements incurred by such Person in connection with the consummation of one or more Permitted Acquisitions, any Investment permitted hereunder or any license, transfer or other Asset Sale permitted hereunder;

(m) Indebtedness of a Person whose assets or Capital Stock are acquired by Borrower or any of its Subsidiaries in a Permitted Acquisition in an aggregate amount not to exceed, together with the aggregate amount of Indebtedness incurred pursuant to clause (h) above, $[**] at any one time outstanding; provided, that such Indebtedness (i) was in existence prior to the date of such Permitted Acquisition, (ii) is either purchase money Indebtedness or a Capital Lease with respect to equipment or mortgage financing with respect to a facility or other Indebtedness reasonably satisfactory to the Administrative Agent, and (iii) was not incurred in connection with, or in contemplation of, such Permitted Acquisition;

(n) Permitted Convertible Indebtedness and any Permitted Refinancing Indebtedness in respect thereof in an aggregate outstanding principal amount not to exceed the greater of $[**] and [**]% of the aggregate market capitalization of the Company (based on the closing price of the Common Stock on the trading date immediately prior to the incurrence of such Indebtedness); provided that, any such Indebtedness incurred pursuant to this clause (n) shall not exceed $[**] in the aggregate at any time;

(o) Indebtedness consisting of obligations in respect of letters of credit, bank guarantees, surety bonds or performance bonds in an aggregate outstanding principal amount not to exceed $[**];

(p) [reserved];

(q) Indebtedness owed to any financial institution in respect of purchasing or debit card programs, credit card programs and related liabilities arising from ordinary course treasury, depository or cash management services, including any payments in connection with the termination thereof;

(r) Indebtedness consisting of take-or-pay obligations contained in supply arrangements in the ordinary course of business;

(s) customer deposits and advance payments received in the ordinary course of business from customers for goods purchased in the ordinary course of business;

(t) Indebtedness incurred in connection with bankers' acceptances, discounted bills of exchange, warehouse receipts or similar facilities or the discounting or factoring of receivables for collection purposes, in each case incurred or undertaken in the ordinary course of business;

(u) guarantees incurred in the ordinary course of business in respect of obligations to suppliers, customers, franchisees, lessors, licensees, sub-licensees and distribution partners;

(v) to the extent constituting Indebtedness, obligations under a Permitted Royalty Transaction; provided that with respect to any Permitted Royalty Transaction entered into after the Closing Date (i), prior to entering into a Permitted Royalty Transaction, the Borrower shall provide written notice to the Lenders of any process run by or on behalf of the Borrower involving a Royalty Monetization Transaction and to negotiate in good faith with the Lenders should the Lenders elect to submit a bid for such Royalty Monetization Transaction; provided that the Borrower shall in no way be precluded from soliciting other bids and conducting contemporaneous negotiations with other third party bidders for such Royalty Monetization Transaction;

(w) [reserved];

(x) obligations under any Hedging Agreement;

(y) any Permitted Equity Derivatives;

(z) other Indebtedness of Borrower and its Subsidiaries, which is unsecured in an aggregate amount not to exceed at any time $[**]; and

(aa) ordinary course tenant improvement loans relating to leased property.

For purposes of determining compliance with any Dollar-denominated restriction on the incurrence of Indebtedness, the Dollar equivalent principal amount of Indebtedness denominated in a foreign currency shall be calculated based on the relevant currency exchange rate in effect on the date such Indebtedness was incurred, in the case of term debt, or first committed, in the case of revolving credit debt.

"Permitted Intercompany Investments" means Investments by (a) a Loan Party to or in another Loan Party, (b) a Subsidiary that is not a Loan Party to or in another Subsidiary that is not a Loan Party; provided that no Intellectual Property Rights; provided, that, no Product or Intellectual Property Rights with respect to any Product shall be assigned, transferred, contributed, licensed, sublicensed, or otherwise disposed by any Loan Party to a Subsidiary that is not a Loan Party pursuant to this clause (b) except for Registrations required to be transferred to satisfy regulatory requirements in jurisdictions outside the United States, and non-exclusive licenses required to permit such Subsidiary to operate and/or run clinical trials in the ordinary course of business, (c) a Subsidiary that is not a Loan Party to or in a Loan Party, so long as, in the case of a loan or an advance, such Subsidiary that is not a Loan Party subordinates the obligations owed by the Loan Party to the Obligations pursuant to an Intercompany Subordination Agreement and (d) a Loan Party to a subsidiary that is not a Loan Party; provided that, with respect to this clause (d), (i) the aggregate outstanding amount of such Investments does not exceed $[**] in the aggregate outstanding at any time, (ii) Company and its Subsidiaries shall be in compliance with the covenant set forth in Section 6.8 on a pro forma basis after giving effect to such Investment and (iii) in the event such Subsidiary becomes a Loan Party, such Investment is deemed to occur under clause (a) above upon such Subsidiary becoming a Loan Party; provided, further, that, no Product or Intellectual Property Rights with respect to any Product shall be assigned, transferred, contributed, licensed, sublicensed, or otherwise disposed by any Loan Party to a Subsidiary that is not a Loan Party pursuant to this clause (d) except for Registrations required to be transferred to satisfy regulatory requirements in jurisdictions outside the United States, and non-exclusive licenses required to permit such Subsidiary to operate and/or run clinical trials in the ordinary course of business.

"Permitted Investments" means:

(a) Investments in Cash and cash equivalents (including Cash Equivalents);

(b) equity Investments owned as of the Closing Date in any Subsidiary and equity Investments owned after the Closing Date in any Subsidiary as a result of the formation of a Subsidiary to the extent otherwise permitted hereunder;

(c) Permitted Intercompany Investments;

(d) loans and advances to employees of Borrower and its Subsidiaries (i) made in the ordinary course of business and described on Schedule 6.6, and (ii) any refinancings of such loans after the Closing Date in an aggregate amount not to exceed $[**] at any time outstanding;

(e) Permitted Acquisitions;

(f) Investments described in Schedule 6.7 as of the Closing Date;

(g) any Investments consisting of extensions of credit in the nature of accounts receivable or notes receivable arising from the grant of trade credit in the ordinary course of business or received in compromise or resolution of (i) obligations of trade creditors or customers that were incurred in the ordinary course of business of Borrower or any of its Subsidiaries, including pursuant to any plan of reorganization or similar arrangement upon the bankruptcy or insolvency of any trade creditor or customer or (ii) litigation, arbitration or other disputes;

(h) Investments in negotiable instruments deposited or to be deposited for collection in the ordinary course of business;

(i) Investments in the ordinary course of business consisting of customary trade arrangements with customers;

(j) advances made in connection with purchases of goods or services in the ordinary course of business;

(k) Investments held by a Person acquired in a Permitted Acquisition to the extent that such Investments were not made in contemplation of or in connection with such Permitted Acquisition and were in existence on the date of such Permitted Acquisition;

(l) so long as no Event of Default has occurred and is continuing or would result therefrom, Investments in Joint Ventures; provided that, the aggregate amount of all such Investments in Joint Ventures shall not exceed $[**];

(m) Permitted Equity Derivatives;

(n) Investments (including debt obligations) received in connection with the bankruptcy or reorganization of suppliers and customers and in settlement of delinquent obligations of, and other disputes with, customers and suppliers arising in the ordinary course of business;

(o) Investments in Hedging Agreements;

(p) any Investment of the non-cash consideration received from an Asset Sale that was made pursuant to and in compliance with this Agreement;

(q) Investments consisting of earnest money deposits made by Borrower or its Subsidiaries in connection with any letter of intent or other agreement in respect of any Investment permitted by this Agreement;

(r) [reserved];

(s) guarantees of operating leases or of other obligations, in each case, that do not constitute Indebtedness, and are entered into by Borrower or any Subsidiary in the ordinary course of business;

(t) Investments consisting of the redemption, purchase, repurchase or retirement of any Capital Stock of Borrower permitted by this Agreement;

(u) [reserved]; and

(v) so long as no Event of Default has occurred and is continuing or would result therefrom, other Investments in Cash in an aggregate amount outstanding not to exceed $[**].

"Permitted Liens" means:

(a) Liens in favor of Administrative Agent for the benefit of Secured Parties granted pursuant to any Loan Document;

(b) Liens for Taxes (i) not yet due and payable or (ii) if obligations with respect to such Taxes are being contested in good faith by appropriate proceedings promptly instituted and diligently conducted and adequate reserves required by GAAP have been made;

(c) statutory Liens of landlords, banks (and rights of set off), of carriers, warehousemen, mechanics, repairmen, workmen and materialmen, and other Liens imposed by law (other than any such Lien imposed pursuant to Section 401(a)(29) or 412(n) of the Internal Revenue Code or by ERISA), in each case incurred in the ordinary course of business for amounts not yet overdue;

(d) Liens incurred in the ordinary course of business in connection with workers' compensation, unemployment insurance and other types of social security, or to secure the performance of tenders, statutory obligations, surety and appeal bonds, bids, leases, government contracts, trade contracts, performance and return of money bonds and other similar obligations (exclusive of obligations for the payment of borrowed money or other Indebtedness), so long as no foreclosure, sale or similar proceedings have been commenced with respect to any portion of the Collateral on account thereof;

(e) easements, rights of way, restrictions, encroachments, and other minor defects or irregularities in title, in each case which do not and will not interfere in any material respect with the ordinary conduct of the business of Borrower or any of its Subsidiaries;

(f) any interest or title of a lessor or sublessor under any lease of real estate permitted hereunder;

(g) Liens solely on any cash earnest money deposits made by Borrower or any of its Subsidiaries in connection with any letter of intent or purchase agreement permitted hereunder;

(h) purported Liens evidenced by the filing of precautionary UCC financing statements relating solely to operating leases of personal property entered into in the ordinary course of business;

(i) Liens in favor of customs and revenue authorities arising as a matter of law to secure payment of customs duties in connection with the importation of goods;

(j) any zoning or similar law or right reserved to or vested in any governmental office or agency to control or regulate the use of any real property;

(k) Liens described in Schedule 6.2; provided that any such Lien shall only secure the Indebtedness that it secures on the Closing Date and any Permitted Refinancing Indebtedness in respect thereof;

(l) Liens securing Capital Leases or purchase money Indebtedness permitted pursuant to clause (h) of the definition of Permitted Indebtedness; provided, any such Lien shall encumber only the asset subject to such Capital Lease or the asset acquired with the proceeds of such Indebtedness;

(m) Liens granted in the ordinary course of business on the unearned portion of insurance premiums securing the financing of insurance premiums to the extent the financing is permitted under the definition of Permitted Indebtedness;

(n) Liens assumed by Borrower and its Subsidiaries in connection with a Permitted Acquisition that secure Indebtedness permitted by clause (m) of the definition of Permitted Indebtedness;

(o) Liens solely on any cash and Cash Equivalents (and related segregated Deposit Accounts or Securities Accounts) securing Indebtedness permitted pursuant to clause (o) of the definition of Permitted Indebtedness, and (ii) Liens on cash deposits not exceeding $[**] in the aggregate securing Indebtedness permitted pursuant to clause (q) of the definition of Permitted Indebtedness;

(p) [reserved];

(q) Liens in favor of vendors or suppliers of such Person in the ordinary course of business to the extent encumbering property purchased from or provided by such vendors or suppliers and the proceeds thereof;

(r) Liens securing any judgments, writs or warrants of attachment or similar process not constituting an Event of Default under Section 8.1(h);

(s) Liens that are contractual rights of setoff relating to purchase orders entered into with customers, vendors or suppliers of such Person in the ordinary course of business;

(t) to the extent constituting Liens, licenses and sublicenses pursuant to Asset Sales permitted under Sections 6.9(b)(xi), (b)(xvii), (b)(xviii), (b)(xix), and non-exclusive licenses permitted under Section 6.9(b)(xx);

(u) bankers' Liens, rights of setoff and other similar Liens existing solely with respect to cash and Cash Equivalents on deposit in one or more accounts maintained by Borrower or its Subsidiaries, in each case granted in the ordinary course of business in favor of the bank or banks with which such accounts are maintained, securing amounts owing to such bank with respect to cash management and operating account arrangements, including those involving pooled accounts and netting

arrangements, as part of a bank's standard term and conditions; provided, that, unless such Liens are non-consensual and arise by operation of law, in no case shall any such Liens secure (either directly or indirectly) the repayment of any Indebtedness;

(v) Liens (i) of a collection bank arising under Section 4-210 of the UCC, or any comparable or successor provision, on items in the course of collection; and (ii) in favor of banking or other financial institutions or entities, or electronic payment service providers, arising as a matter of law encumbering deposits (including the right of set-off) and which are within the general parameters customary in the banking or finance industry;

(w) Permitted Security Interests (as defined below) granted pursuant to any Permitted Royalty Transaction;

(x) Liens on specific items of inventory or other goods and proceeds of the Borrower or a Subsidiary securing such Person's obligations in respect of bankers' acceptances or letters of credit entered into in the ordinary course of business issued or created for the account of such Person to facilitate the purchase, shipment or storage of such inventory or other goods;

(y) Liens arising from, or from UCC financing statement filings regarding, operating leases entered into by the Borrower or its Subsidiaries in the ordinary course of business or consistent with industry practice;

(z) Liens on inventory arising out of conditional sale, title retention, consignment or similar arrangements with customers or suppliers, in each case to the extent entered into in the ordinary course of business or consistent with industry practice;

(aa) any encumbrance or restriction, including any put and call arrangements, related to Capital Stock in any Joint Venture set forth in the operating or organizational documents of such Joint Venture or any related joint venture, shareholders' or similar agreement;

(bb) Liens on insurance policies and the proceeds thereof securing the financing of the premiums with respect thereto;

(cc) [reserved];

(dd) [reserved];

(ee) [reserved];

(ff) Liens of a collecting bank arising in the ordinary course of business under Section 4-208 of the UCC in effect in the relevant jurisdiction covering only the items being collected upon; and

(gg) other Liens incurred in the ordinary course of business of Borrower or any Subsidiary of Borrower with respect to obligations that do not exceed, together with Liens described in clause (b) above, $[**] in the aggregate at any one time outstanding; provided, that, such Lien shall not be on Product Intellectual Property Rights, Platform Intellectual Property Rights or Registrations.

Notwithstanding anything to the contrary contained in this Agreement or in any other Loan Document, no Liens on any Product (other than inventory), Intellectual Property Rights relating to any Product or Registrations relating to any Product shall be permitted under this Agreement (other than non-consensual

Liens constituting "Permitted Liens" and Liens described in clauses (a), (t) and (w) above).

"Permitted Plozasiran Agreement" means any agreement with respect to a Permitted Royalty Transaction with respect to Plozasiran, subject to the prepayment obligations required by Section 2.10(g).

"Permitted Product Agreement" means a Product Agreement that grants a license or sublicense of any rights under any Product Intellectual Property Rights, Platform Intellectual Property Rights, Registrations, Regulatory Documentation, or Collateral that allows the Licensee to research, develop, Commercialize, manufacture, distribute or otherwise utilize a Product in any Core Market or Non-Core Market; provided that, any such Product Agreement (i) [**], (ii) permits the disclosure of royalty, development, commercialization and similar reports, and copies of any written notices (other than filings, submissions, reports, notices, correspondence and other documentation related to routine patent prosecution in the ordinary course and any materials that would be deemed privileged in connection with patent litigation) furnished to or by any the Loan Parties pursuant to such Product Agreement, to the Administrative Agent and the Lenders in accordance with Section 5.1(e), and (iii) [**]; provided that, if requested by Borrower, the Administrative Agent shall enter into [**], in form and substance reasonably satisfactory to the Administrative Agent, in connection with the entry by Borrower or any Subsidiary into any Permitted Product Agreement.

"Permitted Product Transaction" means the grant of a license or sublicense or any other disposition of any rights under any Product Intellectual Property Rights, Platform Intellectual Property Rights, Registrations, Regulatory Documentation, or Collateral pursuant to a Permitted Product Agreement.

"Permitted Reduction" means a Reduction taken by a counterparty to a Permitted Product Agreement, including any such agreement for a Partnered Asset, against any payment of any Royalties, Milestones, Profit Share Amounts or Joint Venture Proceeds pursuant to the express terms of such Permitted Product Agreement, excluding any amount owing from the Borrower or any of its Subsidiaries to the counterparty of such Permitted Product Agreement in respect of any right of such counterparty against the Borrower or any of its Subsidiaries arising from or in connection with such Permitted Product Agreement (other than an obligation owing from the Borrower or any of its Subsidiaries to such counterparty due to any overpayment of Royalties, Milestones, Profit Share Amounts or Joint Venture Proceeds by such counterparty).

"Permitted Refinancing Indebtedness" means any Indebtedness of Borrower or any of its Subsidiaries issued in exchange for, or the net proceeds of which are used to renew, refund, refinance, replace, defease or discharge other Indebtedness of Borrower or any of its Subsidiaries; provided that:

(a) the principal amount (or accreted value, if applicable) of such Permitted Refinancing Indebtedness does not exceed the principal amount (or accreted value, if applicable) of the Indebtedness renewed, refunded, refinanced, replaced, defeased or discharged (plus all accrued interest on the Indebtedness and the amount of all fees and expenses, including premiums, incurred in connection therewith);

(b) such Permitted Refinancing Indebtedness (i) has a final maturity date later than the final maturity date of, and has a Weighted Average Life to Maturity equal to or greater than the Weighted Average Life to Maturity of, the Indebtedness being renewed, refunded, refinanced, replaced, defeased or discharged or (ii) has a final maturity date later than the final maturity date of, and has a Weighted Average Life to Maturity equal to or greater than the Weighted Average Life to Maturity of, the Term Loans;

(c) if the Indebtedness being renewed, refunded, refinanced, replaced, defeased or discharged is subordinated in right of payment to the Obligations, such Permitted Refinancing Indebtedness is subordinated in right of payment to, the Obligations on terms at least as favorable to Administrative Agent and the Lenders as those contained in the documentation governing the Indebtedness being renewed, refunded, refinanced, replaced, defeased or discharged;

(d) such Indebtedness is incurred either by Borrower or by the Subsidiary who is the obligor on the Indebtedness being renewed, refunded, refinanced, replaced, defeased or discharged; and

(e) in the case of Permitted Convertible Indebtedness, such Indebtedness complies with the terms set forth in the proviso of the definition of Permitted Convertible Indebtedness.

"Permitted Reinvestment Purposes" has the meaning specified in Section 2.10(b)(ii).

"Permitted Royalty Transaction" means (a) the Royalty Monetization Transaction pursuant to the RPI Agreement as in effect on November 9, 2022 (as amended, supplemented or otherwise modified from time to time in a manner not adverse to the Lenders, it being understood that any amendment, supplement or modification that would (i) adversely affect the amount or timing of the payment of the RPI Milestones or (ii) sell any additional Royalties, Milestones or other payments with respect to any Product would be adverse to Lenders) and (b) any Royalty Monetization Transaction involving the sale by Borrower to any third party of up to a [**]% Royalty entitlement or [**]% Product Revenues entitlement (in the aggregate), in each case, on net sales of Plozasiran, including the grant of a Permitted Security Interest to such third party in connection with such Permitted Royalty Transaction.

"Permitted Security Interest" means, solely in connection with a Permitted Royalty Transaction under clause (b) of such defined term, (a) a first priority security interest on the Royalties or Product Revenues sold to a third party pursuant to a Permitted Royalty Transaction, and (b) with respect to a sale of Product Revenues, a second priority security interest (subordinated in all respects to the Administrative Agent's first priority security interest pursuant to an intercreditor agreement reasonably acceptable to the Administrative Agent) on the Plozasiran Product Intellectual Property Rights, in each case granted by the Borrower to a buyer of such Royalties or Product Revenues in connection with such Permitted Royalty Transaction solely to secure the payment of such Royalties or Product Revenues.

"Permitted Zodasiran Agreement" means any Permitted Product Agreement with respect to Zodasiran entered into between the Borrower or any of its Subsidiaries with another Person solely with respect to any research, development, manufacture, use, marketing, Commercialization and/or distribution arrangements with respect to Zodasiran and/or the granting of any exclusive licenses in any territory with respect to Zodasiran subject to any prepayments required by Section 2.10(f); provided that, such transaction must be consummated on or prior to August 7, 2026.

"Person" means and includes natural persons, corporations, companies, limited partnerships, general partnerships, limited liability companies, limited liability partnerships, joint stock companies, Joint Ventures, associations, companies, trusts, banks, trust companies, land trusts, business trusts or other organizations, whether or not legal entities, and Governmental Authorities.

"Personal Information" means any information that identifies or can be used to identify a natural person, including any information defined as "personal data," "personally identifiable information," "personal information," "protected health information," or "nonpublic personal information" under applicable Data Protection Laws.

"Pipeline Asset Monetization" means, with respect to any Pipeline Product (excluding, for the avoidance of doubt, any Material Product), (i) the sale, assignment, conveyance, transfer, or other disposition for value of Capital Stock pursuant to any Joint Venture that relates solely to one or more Pipeline Products in a specific territory (including worldwide), (ii) the license or sublicense to a third party for value of any Pipeline Product in a specific territory (including worldwide) pursuant to a Permitted Product Agreement, and/or or (iii) the sale, assignment, conveyance, transfer, or other disposition for value of all or substantially all of the Pipeline Assets for such Pipeline Product required to develop, manufacture and Commercialize such Pipeline Product in a specific territory (including worldwide); provided that (A) solely in case of (iii) above, such transactions do not include or otherwise relate to any tangible or intangible assets used or held for use in the development, manufacture or Commercialization of any Material Product, and (B) in each case (i), (ii) and (iii) above, all amounts received by Borrower and its Subsidiaries in respect of such territory (a "Monetized Territory") shall be subject to the mandatory prepayments set forth in Section 2.10(h) (it being understood, for the avoidance of doubt, that any amounts generated by Borrower and its Subsidiaries from the development, manufacture and Commercialization by the Loan Parties of such Pipeline Product outside such Monetized Territory shall be subject to the mandatory prepayments set forth in Section 2.10(i)).

"Pipeline Assets" shall mean, with respect to a Pipeline Product, on a territory-by-territory basis, the Product Intellectual Property Rights, Regulatory Documentation, and other tangible and intangible assets exclusively relating to such Pipeline Product in a territory, in each case, solely to the extent such tangible and intangible assets are both (x) required to develop and Commercialize such Pipeline Product, and (y) are not related to or otherwise useful for the development, manufacture or Commercialization of any other Product (other than such Pipeline Product in such territory). For the avoidance of doubt, Pipeline Assets specifically exclude all Platform Intellectual Property Rights and all other tangible and intangible assets that are related to or otherwise useful for the development, manufacture, use or Commercialization of any Product other than such Pipeline Product and specifically shall not include real property, plant, equipment, inventory and other tangible assets of Borrower, any of its subsidiaries or Affiliates or any deposit accounts, cash and cash equivalents, investment property, and instruments of Borrower, any of its subsidiaries and Affiliates.

"Pipeline Percentage" has the meaning specified in Section 2.10(h).

"Pipeline Product" means any Product, other than Material Products, being researched, developed, manufactured or Commercialized by the Borrower, any of its Subsidiaries, or any Licensees from time to time, including any Product acquired after the Closing Date of this Agreement, regardless of form, including, for the avoidance of doubt, any Product that was the subject of a Specified Transaction as of the Closing Date that is not consummated within the time period set forth in subsection (c) of the definition of "Specified Transaction".

"Platform Intellectual Property Rights" means any and all (a) Platform Technology, (b) Platform Patents, and (c) Intellectual Property Rights other than Platform Technology and Platform Patents owned by or exclusively licensed to, or purported to be owned by or exclusively licensed to, Borrower or its Subsidiaries relating to the Platform Technology (but excluding all Product Intellectual Property Rights) or that, absent a valid license or other rights under such other Intellectual Property Rights, would be infringed or misappropriated by the research, development, manufacture, use or Commercialization of the Platform Technology, including the Platform Patents and such other Intellectual Property Rights listed on Schedule 4.23(c)(ii).

"Platform Patents" means the U.S. and foreign Patents and pending Patent applications owned or Controlled by the Borrower or any of its Subsidiaries, now or in the future, that claim or otherwise cover generally the Platform Technology, including the making, using or selling of RNAi Molecules generally

and do not specifically claim or otherwise cover solely the making, using or selling of only a specific Product. "Platform Patents" include the Patents listed on Schedule 4.23(c)(ii).

"Platform Technology" means all Know-How owned or Controlled by the Borrower and its Subsidiaries, now or in the future, that relates generally to the composition of matter, formulation, form, or methods of use, delivery or manufacture of RNAi Molecules regardless of gene target and do not specifically relate to the composition of matter, formulation, form, or methods of use, delivery or manufacture solely of a specific Product.

"Pledge and Security Agreement" means the Pledge and Security Agreement executed by Grantors in favor of Administrative Agent for the benefit of the Secured Parties, in form and substance reasonably satisfactory to Administrative Agent, as amended, amended and restated, supplemented or otherwise modified from time to time.

"Plozasiran" means the pharmaceutical product candidate having the chemical structure set forth on Schedule 1.1(a), including all forms (including salt forms), presentations, strengths, doses, and formulations (including any method of delivery), either alone or as a Combination Product, and including any other licensed products licensed or sublicensed to a third party under any Permitted Plozasiran Agreement.

"Prime Rate" means the rate of interest quoted in The Wall Street Journal, Money Rates Section as the Prime Rate (currently defined as the base rate on corporate loans posted by at least 75% of the nation's thirty (30) largest banks), as in effect from time to time. The Prime Rate is a reference rate and does not necessarily represent the lowest or best rate actually charged to any customer. The Administrative Agent or any other Lender may make commercial loans or other loans at rates of interest at, above or below the Prime Rate.

"Principal Office" means Administrative Agent's "Principal Office" as set forth on Appendix B, or such other office as such Person may from time to time designate in writing to Company and each Lender.

"Pro Rata Share" means, with respect to:

(a) (i) a Lender's obligation to make the Initial Term Loan, the percentage obtained by dividing (A) such Lender's Initial Term Loan Commitment by (B) the Total Initial Term Loan Commitment, (ii) a Lender's obligation to make a Delayed Draw Term Loan, the percentage obtained by dividing (A) such Lender's Delayed Draw Term Loan Commitment by (B) the aggregate amount of the Lenders' Delayed Draw Term Loan Commitments and (iii) a Lender's right to make an Incremental Term Loan, the percentage obtained by dividing (A) such Lender's outstanding Term Loans and unfunded Delayed Draw Term Loan Commitments by (B) the aggregate amount of all of the Lenders' outstanding Term Loans and unfunded Delayed Draw Term Loan Commitments;

(b) a Lender's right to receive payments of interest, fees and principal with respect to a Term Loan, the percentage obtained by dividing (i) the aggregate unpaid principal amount of such Lender's portion of the Term Loan, by (ii) the aggregate unpaid principal amount of the Term Loan; and

(c) all other matters, the percentage obtained by dividing (i) the sum of such Lender's Delayed Draw Term Loan Commitment and the unpaid principal amount of such Lender's portion of the Term Loan, by (ii) the sum of the Total Delayed Draw Term Loan Commitment and the aggregate unpaid principal amount of the Term Loan.

"Product" means any product or product candidate being researched, developed, manufactured, or Commercialized by the Borrower, its Subsidiaries or any Licensees on or after the Closing Date, including but not limited to Zodasiran, any Pipeline Product, any Partnered Assets, and Plozasiran, including all forms (including salt forms), presentations, strengths, dosages and formulations (including any method of delivery), but excluding any third party product manufactured by Borrower or such Subsidiary solely on a contract manufacturing basis for such third party that is not a Licensee under a License Agreement.

"Product Agreement" means any agreement or Joint Venture entered into between Company or any of its Subsidiaries with another Person that includes any research, development, manufacturing, marketing, Commercialization and/or distribution arrangements, the granting of a license or sublicense of, or covenant not to assert, any rights under any Product Intellectual Property Rights, Platform Intellectual Property Rights, Registrations, Regulatory Documentation, or Collateral. For the avoidance of doubt, the License Agreements and the RPI Agreement are "Product Agreements".

"Product Intellectual Property Rights" means, on a Product-by-Product basis, any and all Product Patents and other Intellectual Property Rights owned by or exclusively licensed to, or purported to be owned by or exclusively licensed to, Borrower or its Subsidiaries that (a) are necessary and used exclusively in the research, development, manufacture, use or Commercialization of such Product and (b) are not necessary or used in the research, development, manufacture, use or Commercialization of any other Product, including, for each Partnered Asset, the Patents, registered and applied for Copyrights, and registered and applied for Trademarks constituting such Intellectual Property Rights listed on Schedule 4.23(c)(i).

"Product Patents" means, on a Product-by-Product basis, the U.S. and foreign Patents and pending Patent applications (other than Platform Patents) that are owned or Controlled by the Borrower or any of its Subsidiaries, now or in the future, that claim or otherwise cover solely the composition of matter, formulation, form, or method of use, delivery or manufacture of such specific Product (and no other Product), including the making, using, or selling of such specific Product, and are necessary to the research, development, manufacture, use or Commercialization of such Specific Product. "Product Patents" include the Patents listed on Schedule 4.23(c)(i).

"Product Revenue" means, for any period, (a) the consolidated gross revenues of the Borrower and its Subsidiaries generated solely through the commercial sale of Products to third parties by the Borrower and its Subsidiaries or any of its or their Licensees during such period, less, without duplication, any Permitted Deductions, and (b) the consolidated gross revenues of the Borrower and its Subsidiaries generated solely through the commercial supply of products to Licensees and distributors calculated at the applicable transfer price, all, in respect of clauses (a) and (b), as determined in accordance with GAAP and calculated on a basis consistent with the applicable financial statements of the Borrower or its Subsidiaries. For purposes of determining Product Revenue, a "sale" shall not include transfers or dispositions of such Product for pre-clinical or clinical purposes or as samples or for charitable, promotional, manufacturing, testing, qualification or regulatory purposes, in each case, to the extent at or below the Borrower's or its Subsidiaries' cost of goods therefor. Product Revenue shall not include sales or transfers between or among the Borrower or its Affiliates, or its or their Licensees.

If any Product is sold as a Combination Product in any country, then Product Revenue for such Combination Product will be calculated by the Combination Product Calculation (replacing each instance of "Global Net Sales" thereunder with "Product Revenue," mutatis mutandis).

"Product Revenue Report" has the meaning set forth in Section 5.1(t).

"Profit Share Amount" means with respect to any Permitted Product Agreement that includes a profit sharing or profit and loss sharing arrangement in a particular territory (a "Profit Share Territory"),

for a particular Fiscal Quarter, the amount equal to the Loan Parties' percentage of the gross profits generated from all sales of Products made in the Profit Share Territory in such Fiscal Quarter (including any Sublicense Revenue), regardless of whether such sales are made by a Loan Party, any counterparty or any Licensees under such Permitted Product Agreement; provided, however, that notwithstanding the foregoing, in the case of Fazirsiran, the Profit Share Amount shall be amount equal to [**]% of (a) Net Sales (as defined in the Fazirsiran License Agreement) of Products (as defined in the Fazirsiran License Agreement), regardless of whether such sales are made by a Loan Party or any counterparty under the Fazirsiran License Agreement, and (b) Sublicense Revenue in the Profit-Share Territory (each term, as defined in the Fazirsiran License Agreement).

"Profit Share Territory" has (a) with respect to Fazirsiran, the meaning assigned to that term in the Fazirsiran License Agreement, and (b) with respect to all other Products, the meaning assigned to such term in the definition of Profit Share Amount.

"Projections" has the meaning specified in Section 4.8.

"Protective Advances" has the meaning specified in Section 9.11.

"Public Health Laws" means all Requirements of Law relating to the procurement, development, clinical and non-clinical evaluation, product approval or licensure, manufacture, production, analysis, distribution, dispensing, importation, exportation, use, handling, quality, sale, labeling, promotion, clinical trial registration or post market requirements of any drug, biologic or other medical product (including, without limitation, any ingredient or component of the foregoing products) subject to regulation under the FDA Laws and the Public Health Service Act (42 U.S.C. § 201 et seq.), as well as comparable applicable foreign laws, and including without limitation the regulations promulgated by the FDA at Title 21 of the Code of Federal Regulations and all applicable regulations promulgated by the National Institutes of Health ("NIH") and codified at Title 42 of the Code of Federal Regulations, and guidance, compliance, guides, and other policies issued by the FDA, the NIH and other comparable Governmental Authorities.

"Qualified Capital Stock" means, with respect to any Person, all Capital Stock of such Person that is not Disqualified Capital Stock.

"Qualified Cash" means, as of any date of determination, (x) prior to the date that is [**] after the Closing Date (or such later date as agreed in writing by the Administrative Agent in its reasonable discretion), the amount of unrestricted Cash and Cash Equivalents (other than restrictions created by the Collateral Documents) of the Loan Parties that is in Deposit Accounts or Securities Accounts located in the United States and (y) on and after the date that is [**] after the Closing Date (or such later date as agreed in writing by the Administrative Agent in its reasonable discretion), the amount of unrestricted Cash and Cash Equivalents (other than restrictions created by the Collateral Documents) of the Loan Parties that is in Deposit Accounts or Securities Accounts located in the United States, or any combination thereof and, in each case subject to a first priority perfected security interest (including in the case of Deposit Accounts and Securities Accounts located in the United States, subject to a Control Agreement).

"Qualified Entity" means any entity that (a) is a pharmaceutical and/or biologics company with global annual revenue for its most recently ended fiscal year that is equal to or greater than $[**] and (b) [**].

"Real Estate Asset" means, at any time of determination, any Real Property owned by a Loan Party, but only to the extent such Real Property constitutes Collateral and is encumbered by a Mortgage pursuant to the terms of this Agreement.

"Real Property" means, collectively, all right, title and interest (including any leasehold, mineral or other estate) in and to any and all parcels of or interests in real property owned, leased or operated by any person.

"Recipient" has the meaning assigned to such term in Section 10.20.

"Reduction" means any set-off, counterclaim, credit, reduction or deduction, whether by contract or otherwise, taken against Royalties, Milestones, Sublicense Revenues, Profit Share Amounts or Joint Venture Proceeds.

"Register" has the meaning specified in Section 2.3(b).

"Registrations" shall mean authorizations, approvals, licenses, permits, certificates, registrations, listings, certificates, or exemptions of or issued by any Governmental Authority (including marketing approvals, investigational new drug applications or clinical trial applications, product recertifications, manufacturing approvals and authorizations, pricing and reimbursement approvals, labeling approvals or their foreign equivalent) that are required for the research, development, manufacture, commercialization, distribution, import, export, marketing, storage, transportation, pricing, Governmental Authority reimbursement, use and sale of Products.

"Regulation D" means Regulation D of the Board of Governors of the Federal Reserve System, as in effect from time to time.

"Regulatory Action" means any administrative or regulatory action, proceeding or investigation, warning letter, untitled letter, other notice of violation letter, recall, seizure, injunction or complaint for injunction, Section 305 notice or other similar written communication, consent order or consent decree, issued under the Public Health Laws by the FDA, the U.S. Department of Health and Human Services, the U.S. Department of Justice, or any comparable Governmental Authority in any other regulatory jurisdiction, including any inspectional observations recorded on a Form FDA 483, any Establishment Inspection Report, and any written request from FDA for a regulatory meeting.

"Regulatory Documentation" means all (a) Registrations, (b) written correspondence and reports submitted to or received from Governmental Authorities (including minutes and official contact reports relating to any communications with any Governmental Authority) and all supporting documents with respect thereto, including all advertising and promotion documents, adverse event files, and complaint files, and (c) non-clinical and clinical data, research protocols, and data contained or relied upon in any of the foregoing, in each case ((a), (b), and (c)) relating to any Product.

"Reinvestment Amounts" has the meaning specified in Section 2.10(b)(ii).

"Related Fund" means, with respect to any Lender that is an investment fund or an Affiliate of an investment fund, any other Person that makes, purchases, holds or otherwise invests in commercial loans and that is managed, administered or advised by the same investment advisor as such Lender or by an Affiliate of such investment advisor.

"Release" means any release, spill, emission, leaking, pumping, pouring, injection, escaping, deposit, disposal, discharge, dispersal, dumping, leaching or migration of any Hazardous Material into the indoor or outdoor environment (including the abandonment or disposal of any barrels, containers or other closed receptacles containing any Hazardous Material), including the movement of any Hazardous Material through the air, soil, surface water or groundwater.

"Remedial Action" means all actions taken to (a) correct or address any actual or threatened non-compliance with Environmental Law, (b) clean up, remove, remediate, contain, treat, monitor, assess, evaluate or in any other way address Hazardous Materials in the indoor or outdoor environment, (c) prevent or minimize a Release or threatened Release of Hazardous Materials so they do not migrate or endanger or threaten to endanger public health or welfare or the indoor or outdoor environment, (d) perform pre-remedial studies and investigations and post-remedial operation and maintenance activities; or (e) perform any other actions authorized or required by Environmental Law or Governmental Authority.

"Replacement Lender" has the meaning specified in Section 2.18.

"Required Lenders" means Lenders whose Pro Rata Share (calculated in accordance with clause (c) of the definition thereof) aggregate at least 50.1%.

"Required Milestone Cash Amount" means (a) at all times when the Market Capitalization Milestone is satisfied, $[**] or (b) at any time when the Market Capitalization Milestone is not satisfied and remains unsatisfied for a period of [**], $[**]; provided, that, if the Market Capitalization Milestone is unsatisfied for a period of [**], the Required Milestone Cash Amount shall remain at $[**] until such time as the Market Capitalization Milestone is satisfied for a period of [**].

"Requirements of Law" means, with respect to any Person, collectively, the common law and all federal, state, provincial, local, foreign, multinational or international laws, statutes, codes, treaties, standards, rules and regulations, guidelines, ordinances, orders, judgments, writs, injunctions, decrees (including administrative or judicial precedents or authorities) and the interpretation or administration thereof by, and other determinations, directives, requirements or requests of, any Governmental Authority, in each case that are applicable to or binding upon such Person or any of its property or to which such Person or any of its property is subject.

"Restricted Junior Payment" means (a) any dividend or other distribution, direct or indirect, on account of any shares of any class of Capital Stock of Borrower now or hereafter outstanding, except a dividend payable solely in shares of Capital Stock to the holders of that class, together with any payment or distribution pursuant to a "plan of division" under the Delaware Limited Liability Act or any comparable transaction under any similar law, (b) any redemption, retirement, sinking fund or similar payment, purchase or other acquisition for value, direct or indirect, of any shares of any class of Capital Stock of Borrower or any of its Subsidiaries that is not a Loan Party now or hereafter outstanding, (c) any payment made to retire, or to obtain the surrender of, any outstanding warrants, options or other rights to acquire shares of any class of Capital Stock of Borrower or any of its Subsidiaries that is not a Loan Party now or hereafter outstanding, and (d) any payment or prepayment of principal of, premium, if any, or interest on, or redemption, purchase, retirement, defeasance (including in substance or legal defeasance), sinking fund or similar payment with respect to, any subordinated Indebtedness.

"Restricted License" means any Product Agreement entered into after the Closing Date that (i) cannot be collaterally assigned to secure the Obligations, or otherwise contains provisions that restrict or penalize the granting of a security interest in or Lien securing the Obligations on such Product Agreement or the related Product Intellectual Property Rights, (ii) restricts the assignment of such Product Agreement upon the sale or other disposition of all or substantially all of the assets to which such Product Agreement relates (other than customary provisions requiring the assumption by the applicable purchaser of all obligations under such Product Agreement), or (iii) does not permit the disclosure of information to be provided thereunder to Administrative Agent and the Lenders, any purchaser or prospective purchaser in a foreclosure or other transfer of all or any portion of the Collateral (subject to customary confidentiality obligations); provided a Product Agreement shall not be a "Restricted License" by virtue of clause (iii) if

Borrower and/or the applicable Subsidiary has used commercially reasonable efforts to remove or not include any such restriction.

"RNAi Molecule" means a molecule comprising an exogenous double-stranded oligonucleotide (i.e., RNA or modified variants thereof) comprising a nucleotide sequence designed to inhibit the expression of a gene using the RNA interference mechanism.

"Royalties" means (i) any and all royalty payments received by or on behalf of Borrower or its Subsidiaries under any Permitted Product Agreement with respect to a Product, (ii) any and all payments received by Borrower or its Subsidiaries in lieu of such payments described in the foregoing clause (i) under the applicable Permitted Product Agreement, (iii) any and all interest payments received by or on behalf of Borrower or its Subsidiaries under a Permitted Product Agreement assessed on any payments or amounts described in the foregoing clauses (i) and (ii), and (iv) without duplication of any payment actually made under clauses (i), (ii) and (iii), any and all "proceeds" recoverable or recovered with respect to any of the foregoing.

"Royalty Monetization Transaction" means any monetization transaction involving the sale, transfer, option or collateralization of (i) any monetary payments (contingent or otherwise) payable to Borrower or its Subsidiaries by a counterparty under a Product Agreement (including any Royalties, Milestones and Profit Share Amounts payable thereunder), or (ii) any Product Revenues, in each case whether in whole or in part, in each case (i) and (ii) including but not limited to sales of royalty streams, royalty bonds and other royalty financings, synthetic royalty and revenue interest transactions (including but not limited to clinical trial funding arrangements), and hybrid monetization transactions.

"Royalty Reports" means any royalty reports, net sales reports or other similar reports deliverable by a counterparty pursuant to any Permitted Product Agreement.

"RPI Agreement" means that certain Royalty Purchase Agreement by and between Borrower and Royalty Pharma Investments 2019 ICAV, dated as of November 9, 2022.

"RPI Milestones" means the "Additional Purchase Price Payments" payable to Borrower pursuant to Section 2.1(b) of the RPI Agreement.

"S&P" means Standard & Poor's Ratings Group, a division of The McGraw Hill Corporation.

"Sanctioned Entity" means (a) a country or territory or a government of a country or territory, (b) an agency of the government of a country or territory, (c) an organization directly or indirectly controlled by a country or territory or its government, or (d) a Person resident in or determined to be resident in a country or territory, in each case of clauses (a) through (d) that is a target of Sanctions, including a target of any country or territory sanctions program administered and enforced by OFAC.

"Sanctioned Person" means, at any time (a) any Person named on the list of Specially Designated Nationals and Blocked Persons maintained by OFAC, OFAC's consolidated Non-SDN list or any other Sanctions-related list maintained by any Governmental Authority, (b) a Person or legal entity that is a target of Sanctions, (c) any Person operating, organized or resident in a Sanctioned Entity, or (d) any Person directly or indirectly owned or controlled (individually or in the aggregate) by or acting on behalf of any such Person or Persons described in clauses (a) through (c) above.

"Sanctions" means individually and collectively, respectively, any and all economic sanctions, trade sanctions, financial sanctions, sectoral sanctions, secondary sanctions, trade embargoes anti-terrorism laws and other sanctions laws, regulations or embargoes, including those imposed, administered or enforced

from time to time by: (a) the United States of America, including those administered by OFAC, the U.S. Department of State, the U.S. Department of Commerce, or through any existing or future executive order, (b) the United Nations Security Council, (c) the European Union or any European Union member state, (d) His Majesty's Treasury of the United Kingdom, or (e) any other Governmental Authority with jurisdiction over any Lender or any Loan Party or any of their respective Subsidiaries or Affiliates.

"Secured Parties" has the meaning assigned to that term in the Pledge and Security Agreement.

"Securities Account" means a securities account (as defined in the UCC).

"Securities Act" means the Securities Act of 1933.

"Solvency Certificate" means a Solvency Certificate substantially in the form of Exhibit E.

"Solvent" means, with respect to any Loan Party, that as of the date of determination, both (a)(i) the sum of such Loan Party's debt (including contingent liabilities) does not exceed the present fair saleable value of such Loan Party's present assets, (ii) such Loan Party's capital is not unreasonably small in relation to its business as contemplated on the Closing Date and reflected in the transactions contemplated by the Projections, and (iii) such Loan Party has not incurred and does not intend to incur, or believe (nor should it reasonably believe) that it will incur, debts beyond its ability to pay such debts as they become due (whether at maturity or otherwise) and (b) such Person is "solvent" within the meaning given that term and similar terms under applicable laws relating to fraudulent transfers and conveyances. For purposes of this definition, the amount of any contingent liability at any time shall be computed as the amount that, in light of all of the facts and circumstances existing at such time, represents the amount that can reasonably be expected to become an actual or matured liability (irrespective of whether such contingent liabilities meet the criteria for accrual under Statement of Financial Accounting Standard No. 5).

"Specified Jurisdictions" means, as of any date of determination, the United States and the jurisdiction of organization or formation of a Loan Party.

"Specified Transactions" means, with respect to any Pipeline Assets (other than Plozasiran), any Pipeline Asset Monetization transaction that is under negotiation prior to the Closing Date if (a) the transaction and all material economic terms thereof are identified by the Borrower to the Administrative Agent in writing prior to the Closing Date , (b) prior to entering into such transaction the Borrower shall have delivered to the Administrative Agent the final term sheet for such transaction, the terms of which shall be no less favorable to the Borrower than the terms previously disclosed to the Administrative Agent by the Borrower, and (c) [**].

"Sublicence Revenue" means any amounts (other than Royalties and Milestones) payable to Borrower or its Subsidiaries by a counterparty under a Product Agreement based on sublicenses granted by such counterparty to a Sublicensee under such Product Agreement as such amounts are defined under the equivalent definition included in such Product Agreement; provided that, for clarity, in the case of Fazirsiran, the term "Sublicense Revenue" shall have the meaning set forth in the Fazirsiran License Agreement.

"Subsidiary" means, with respect to any Person, any corporation, company, partnership, limited liability company, association, joint venture or other business entity of which more than 50% of the total voting power of shares of stock, shares, or other ownership interests entitled (without regard to the occurrence of any contingency) to vote in the election of the Person or Persons (whether directors, managers, trustees or other Persons performing similar functions) having the power to direct or cause the direction of the management and policies thereof is at the time owned or controlled, directly or indirectly,

by that Person or one or more of the other Subsidiaries of that Person or a combination thereof; provided, in determining the percentage of ownership interests of any Person controlled by another Person, no ownership interest in the nature of a "qualifying share" of the former Person shall be deemed to be outstanding. Notwithstanding anything to the contrary, for purposes of the Agreement, Visirna and its Subsidiaries and Calando Pharmaceuticals, Inc. shall be deemed not to be a Subsidiary of the Borrower or any Loan Party.

"Survey" means a survey of any Real Property (and all improvements thereon) which is (a) (i) prepared by a surveyor or engineer licensed to perform surveys in the jurisdiction where such Real Property is located, (ii) dated (or redated) not earlier than six months prior to the date of delivery thereof unless there shall have occurred within six months prior to such date of delivery any material exterior construction on the site of such Real Property or any easement, right of way or other interest in the Real Property has been granted or become effective through operation of law or otherwise with respect to such Real Property which, in either case, can be depicted on a survey, in which events, as applicable, such survey shall be dated (or redated) after the completion of such construction or if such construction shall not have been completed as of such date of delivery, not earlier than [**] prior to such date of delivery, or after the grant or effectiveness of any such easement, right of way or other interest in the Real Property, (iii) certified by the surveyor (in a manner reasonably acceptable to Administrative Agent) to the Administrative Agent, and the Title Company, (iv) complying in all respects with the minimum detail requirements of the American Land Title Association as such requirements are in effect on the date of preparation of such survey and (v) sufficient for the Title Company to remove all standard survey exceptions from the title insurance policy relating to such Real Property and issue the endorsements of the type required hereunder.

"Tax" means any present or future tax, levy, impost, duty, assessment, charge, fee, deduction or withholding (including backup withholding) or other charge imposed by any Governmental Authority, and any interest, penalties, additions to tax or other liabilities with respect thereto.

"Term Loan" means, collectively, the Initial Term Loan and each Delayed Draw Term Loan.

"Term Loan Commitment" means, collectively, the Initial Term Loan Commitment and the Delayed Draw Term Loan Commitments.

"Term Loan Maturity Date" means the earlier of (a) August 7, 2031 and (b) the date that the Term Loan shall become due and payable in full hereunder, whether by acceleration or otherwise; provided, that, if such date is not a Business Day, the Term Loan Maturity Date shall be the immediately preceding Business Day.

"Terminated Lender" has the meaning specified in Section 2.18.

"Termination Date" means the date all Obligations (other than contingent obligations with respect to which no claim has been made) are paid in full and the expiration or termination of the Commitments of the Lenders under this Agreement.

"Test Date" has the meaning specified in the definition of Excluded Subsidiary.

"Threshold Amount" means $[**].

"Title Company" has the meaning specified in Section 5.11.

"Title Policy" has the meaning specified in Section 5.11.

"Total Delayed Draw Term Loan Commitment" means the sum of the amounts of the Lenders' Delayed Draw Term Loan Commitments.

"Total Initial Term Loan Commitment" means the sum of the amounts of the Lenders' Initial Term Loan Commitments.

"Trademarks" has the meaning ascribed to such term in the definition of "Intellectual Property Rights."

"True Up Payment" has the meaning specified in the Fee Letter.

"U.S." or "United States" means the United States of America (including all possessions and territories thereof).

"U.S. Tax Compliance Certificate" has the meaning specified in Section 2.15(d)(i)(B)(3).

"UCC" means the Uniform Commercial Code (or any similar or equivalent legislation) as in effect in any applicable jurisdiction.

"Unpaid Interest" shall mean interest that is unpaid, including by the funding of a Delayed Draw Term Loan, or is otherwise not capitalized.

"Visirna" means Visirna Therapeutics Inc.

"VISIRNA JV Products" means the RNAi Molecules that are the subject of that certain License Agreement dated April 25, 2022, between Company and Visirna Therapeutics, Inc. and collectively are defined therein as the "Licensed Compounds" and "Licensed Products", including [**], in the "Licensee Territory" as defined therein, and further including all forms (including salt forms), presentations, strengths, doses, and formulations (including any method of delivery), either alone or as a Combination Product[**].

"Visirna JV Documents" means that certain (i) License Agreement by and between Arrowhead Pharmaceuticals, Inc., a Delaware corporation and Visirna Therapeutics, Inc. dated as of April 25, 2022 (the "Visirna License Agreement"), (ii) Share Purchase Agreement by and among Visirna Therapeutics, Inc., Arrowhead Pharmaceuticals, Inc., Vivo Capital Fund IX (Cayman), L.P., and Vivo Innovation Fund II Holdings, L.P. entered into on April 25, 2022, (iii) Shareholders Agreement between Visirna Therapeutics, Inc., Arrowhead Pharmaceuticals, Inc., Vivo Capital Fund IX (Cayman), L.P., Vivo Innovation Fund II Holdings, L.P., and the other parties thereto from time to time, entered into as of April 25, 2022, (iv) Amended and Restated Memorandum of Association of Visirna Therapeutics, Inc., adopted by a special resolution passed on April 25, 2022, (v) Letter re: Management Rights from Visirna Therapeutics, Inc. to Vivo Capital Fund IX (Cayman), L.P. and Vivo Innovation Fund II Holdings, L.P., dated as of April 25, 2022, and (vi) Clinical Trial Collaboration Agreement by and between Visirna Therapeutics, Inc. and Arrowhead Pharmaceuticals, Inc. entered into as of May 9, 2024.

"Visirna License Agreement" has the meaning set forth in the definition of "Visirna JV Documents".

"Weighted Average Life to Maturity" means, when applied to any Indebtedness at any date, the number of years obtained by dividing:

(a) the sum of the products obtained by multiplying (i) the amount of each then remaining installment, sinking fund, serial maturity or other required payments of principal, including payment at final

maturity, in respect of the Indebtedness, by (ii) the number of years (calculated to the nearest one-twelfth) that will elapse between such date and the making of such payment; by

(b) the then outstanding principal amount of such Indebtedness.

"Wisconsin Facility" has the meaning specified in the definition of Material Real Property.

"Yield Maintenance Premium" has the meaning specified in the Fee Letter.

"Zodasiran" means the pharmaceutical product candidate having the chemical structure set forth on Schedule 1.1(a), including all forms (including salt forms), presentations, strengths, doses, and formulations (including any method of delivery), either alone or as a Combination Product, and including all other products licensed or sublicensed to a third party under any Permitted Zodasiran Agreement.

"Zodasiran Upfront Payment" has the meaning specified in Section 6.9(b)(xix).

"Zodasiran Upfront Payment Balance" has the meaning specified in Section 2.10(f).

Section 1.2 Accounting and Other Terms.

(a) Except as otherwise expressly provided herein, all accounting terms not otherwise defined herein shall have the meanings assigned to them in conformity with GAAP. Financial statements and other information required to be delivered by Borrower to Lenders pursuant to Sections 5.1(b) and 5.1(c) shall be prepared in accordance with GAAP as in effect at the time of such preparation. Subject to the foregoing, calculations in connection with the definitions, covenants and other provisions hereof shall utilize accounting principles and policies in conformity with those used to prepare the Historical Financial Statements. Notwithstanding the foregoing, for purposes of determining compliance with any covenant (including the computation of any financial covenant) contained herein, (i) Indebtedness of Borrower and its Subsidiaries shall be deemed to be carried at 100% of the outstanding principal amount thereof, and the effects of FASB ASC 825 and FASB ASC 470 20 on financial liabilities shall be disregarded, (ii) with respect to the accounting for leases as either operating leases or capital leases and the impact of such accounting in accordance with FASB ASC 840 on the definitions and covenants herein, GAAP as in effect on December 31, 2018 shall be applied and (iii) with respect to revenue recognition and the impact of such accounting in accordance with FASB ASC 606 on the definitions and covenants herein, GAAP as in effect on December 31, 2017 shall be applied.

(b) All terms used in this Agreement which are defined in Article 8 or Article 9 of the UCC as in effect from time to time in the State of New York and which are not otherwise defined herein shall have the same meanings herein as set forth therein, provided that terms used herein which are defined in the UCC as in effect in the State of New York on the date hereof shall continue to have the same meaning notwithstanding any replacement or amendment of such statute except as Administrative Agent may otherwise determine.

(c) For purposes of determining compliance with any incurrence or expenditure tests set forth in this Agreement, any amounts so incurred or expended (to the extent incurred or expended in a currency other than Dollars ($)) shall be converted into Dollars on the basis of the exchange rates (as shown on the Bloomberg currency page for such currency or, if the same does not provide such exchange rate, by reference to such other recognized and publicly available service for displaying exchange rates as may be reasonably selected by Administrative Agent or, in the event no such service is available, on such other basis as is reasonably satisfactory to Administrative Agent) as in effect on the date of such incurrence or expenditure under any provision of any such Section that has an aggregate Dollar limitation provided for

therein (and to the extent the respective incurrence or expenditure test regulates the aggregate amount outstanding at any time and it is expressed in terms of Dollars, all outstanding amounts originally incurred or spent in currencies other than Dollars shall be converted into Dollars on the basis of the exchange rates (as shown on the Bloomberg currency page for such currency or, if the same does not provide such exchange rate, by reference to such other recognized and publicly available service for displaying exchange rates as may be reasonably selected by Administrative Agent or, in the event no such service is available, on such other basis as is reasonably satisfactory to Administrative Agent) as in effect on the date of any new incurrence or expenditures made under any provision of any such Section that regulates the Dollar amount outstanding at any time).

Section 1.3 Interpretation, Etc. Any of the terms defined herein may, unless the context otherwise requires, be used in the singular or the plural, depending on the reference. Whenever the context may require, any pronoun shall include the corresponding masculine, feminine, and neuter forms. The word "will" shall be construed to have the same meaning and effect as the word "shall." References herein to any Section, Appendix, Schedule or Exhibit shall be to a Section, an Appendix, a Schedule or an Exhibit, as the case may be, hereof unless otherwise specifically provided. The use herein of the word "include" or "including," when following any general statement, term or matter, shall not be construed to limit such statement, term or matter to the specific items or matters set forth immediately following such word or to similar items or matters, whether or not no limiting language (such as "without limitation" or "but not limited to" or words of similar import) is used with reference thereto, but rather shall be deemed to refer to all other items or matters that fall within the broadest possible scope of such general statement, term or matter. The words "asset" and "property" shall be construed to have the same meaning and effect and to refer to any right or interest in or to assets and properties of any kind whatsoever, whether real, personal or mixed and whether tangible or intangible. Any reference herein or in any other Loan Document to the satisfaction, repayment, or payment in full of the Obligations or Guaranteed Obligations shall mean (a) the payment or repayment in full in immediately available funds of (i) the principal amount of, and interest accrued and unpaid with respect to, all outstanding Loans, together with the payment of any premium applicable to the repayment of the Loans, including any MOIC or Yield Maintenance Premium, (ii) all costs, expenses, or indemnities payable pursuant to Section 10.2 or Section 10.3 of this Agreement that have accrued and are unpaid regardless of whether demand has been made therefor, and (iii) all fees, charges (including loan fees, service fees, professional fees, and expense reimbursement) and other Obligations that have accrued hereunder or under any other Loan Document and are unpaid, (b) the receipt by Administrative Agent of cash collateral in order to secure any other contingent Obligations for which a claim or demand for payment has been made on or prior to such time or in respect of matters or circumstances known to the Administrative Agent or a Lender at such time that are reasonably expected to result in any loss, cost, damage, or expense (including attorneys' fees and legal expenses), such cash collateral to be in such amount as the Administrative Agent reasonably determines is appropriate to secure such contingent Obligations, and (c) the termination of all of the Term Loan Commitments. Notwithstanding anything in this Agreement to the contrary, (A) the Dodd-Frank Wall Street Reform and Consumer Protection Act and all requests, rules, guidelines or directives thereunder or issued in connection therewith and (B) all requests, rules, guidelines or directives concerning capital adequacy promulgated by the Bank for International Settlements, the Basel Committee on Banking Supervision (or any successor or similar authority) or the United States or foreign regulatory authorities shall, in each case, be deemed to be enacted, adopted, issued, phased in or effective after the date of this Agreement regardless of the date enacted, adopted, issued, phased in or effective. Unless the context requires otherwise (a) any definition of or reference to any Loan Document, agreement, instrument or other document herein shall be construed as referring to such agreement, instrument or other document as from time to time amended, supplemented or otherwise modified (subject to any restrictions on such amendments, supplements or modifications set forth in any Loan Document), (b) any reference to any law or regulation shall (i) include all statutory and regulatory provisions consolidating, amending, replacing or interpreting or supplementing such law or regulation, and (ii) unless otherwise specified, refer to such law or regulation as amended, modified or

supplemented from time to time, (c) any reference herein to any Person shall be construed to included such Person's successors and permitted assigns and (d) any reference to "on behalf of" with respect to any payments to the Borrower, any Loan Party or any Subsidiary of the Borrower, shall mean a payment made to any agent or representative of such Person (and not, for the avoidance of doubt, the counterparty to any contract or agreement). This Section 1.3 shall apply, mutatis mutandis, to all Loan Documents.

Section 1.4 Time References. Unless otherwise indicated herein, all references to time of day refer to Eastern Standard Time or Eastern daylight saving time, as in effect in New York City on such day. For purposes of the computation of a period of time from a specified date to a later specified date, the word "from" means "from and including" and the words "to" and "until" each means "to but excluding"; provided, however, that with respect to a computation of fees or interest payable to Administrative Agent or any Lender, such period shall in any event consist of at least one full day. Whenever any action or delivery to be taken or made under this Agreement or any other Loan Document shall be stated to be due on a day other than a Business Day, such action or delivery shall be deemed to be due on the next succeeding Business Day; provided, however, that any notices relating to any defaults, Events of Default or remedial actions associated therewith shall be deemed to have been received and/or to occur immediately upon receipt by the intended recipient.

Section 1.5 Certain Matters of Construction. References in this Agreement to "determination" by Administrative Agent include good faith estimates by Administrative Agent (in the case of quantitative determinations) and good faith beliefs by Administrative Agent (in the case of qualitative determinations). A Default or Event of Default shall be deemed to exist at all times during the period commencing on the date that such Default or Event of Default occurs to the date on which such Default or Event of Default is waived in writing pursuant to this Agreement or, in the case of a Default, is cured within any period of cure expressly provided for in this Agreement; and an Event of Default shall "continue" or be "continuing" until such Event of Default has been waived in writing by the Required Lenders. Any Lien referred to in this Agreement or any other Loan Document as having been created in favor of Administrative Agent, any agreement entered into by Administrative Agent pursuant to this Agreement or any other Loan Document, any payment made by or to or funds received by Administrative Agent pursuant to or as contemplated by this Agreement or any other Loan Document, or any act taken or omitted to be taken by Administrative Agent, shall, unless otherwise expressly provided, be created, entered into, made or received, or taken or omitted, for the benefit or account of Administrative Agent and the Lenders. Wherever the phrase "to the knowledge of any Loan Party" or words of similar import relating to the knowledge or the awareness of any Loan Party are used in this Agreement or any other Loan Document, such phrase shall mean and refer to (i) the actual knowledge of a senior officer of any Loan Party or (ii) the knowledge that a senior officer would have obtained if such officer had engaged in good faith and diligent performance of such officer's duties, including the making of such reasonably specific inquiries as may be necessary of the employees or agents of such Loan Party and a good faith attempt to ascertain the existence or accuracy of the matter to which such phrase relates. All covenants hereunder shall be given independent effect so that if a particular action or condition is not permitted by any of such covenants, the fact that it would be permitted by an exception to, or otherwise within the limitations of, another covenant shall not avoid the occurrence of a default if such action is taken or condition exists. In addition, all representations and warranties hereunder shall be given independent effect so that if a particular representation or warranty proves to be incorrect or is breached, the fact that another representation or warranty concerning the same or similar subject matter is correct or is not breached will not affect the incorrectness of a breach of a representation or warranty hereunder.

ARTICLE II

LOANS

Section 2.1 Term Loans.

(a) Initial Term Loans; Delayed Draw Term Loans; Incremental Term Loans. Subject to the terms and conditions hereof:

(i) each Lender severally agrees to make, on the Closing Date, an Initial Term Loan to Company in an amount equal to such Lender's Initial Term Loan Commitment;

(ii) each Lender severally agrees to make, after the Closing Date and at any time prior to the Delayed Draw Commitment Termination Date, one or more Initial Delayed Draw Term Loans to Company in an aggregate principal amount not to exceed such Lender's Delayed Draw Term Loan Commitment; and

(iii) at the option of the Borrower, and subject to the approval of the Lenders in their sole discretion, each Lender may, severally and not jointly, make Incremental Term Loans to the Borrower in an aggregate amount not to exceed $100,000,000.

The Company may make only one borrowing under the Initial Term Loan Commitment, which shall be on the Closing Date. Any amount borrowed under this Section 2.1(a) and subsequently repaid or prepaid may not be reborrowed. Subject to Section 2.9 and 2.10, all amounts owed hereunder with respect to the Initial Term Loan and the Delayed Draw Term Loan shall be paid in full no later than the Term Loan Maturity Date. Each Lender's Initial Term Loan Commitment shall terminate immediately and without further action on the Closing Date, after giving effect to the funding of such Initial Term Loans on the Closing Date. Each Lender's Delayed Draw Term Loan Commitment shall be permanently reduced immediately and without further action upon the funding of each Delayed Draw Term Loan after the Closing Date in an amount equal to such Lender's Pro Rata Share (calculated in accordance with clause (b) of the definition thereof) of such funded Delayed Draw Term Loan on such Credit Date. Each Lender's Delayed Draw Term Loan Commitment shall terminate immediately and without further action on the Delayed Draw Commitment Termination Date; provided that, if at any time, the Total Delayed Draw Term Loan Commitment exceeds the amount of necessary to pay interest on the Term Loans through the Term Loan Maturity Date, the Administrative Agent shall be entitled to reduce the Total Delayed Draw Term Loan Commitment and the Delayed Draw Term Loan Commitment of each Lender on a quarterly basis upon notice to the Borrower and the Lenders without further action.

(b) Borrowing Mechanics for Term Loans.

(i) Company shall deliver to Administrative Agent a fully executed Funding Notice no later than three Business Days prior to the Closing Date (or such shorter period permitted by Administrative Agent), with respect to Term Loans made on the Closing Date. No Funding Notice shall be required to be executed in connection with the Initial Delayed Draw Term Loans and to the extent required by any Lender, the Administrative Agent shall provide any notice required of funding of Initial Delayed Draw Term Loans as described in the next sentence. Promptly upon receipt by Administrative Agent of any such Funding Notice and/or within 1 Business Day (or such earlier date required by any Lender) of the date an interest payment is due, Administrative Agent shall notify each Lender of the proposed borrowing. Administrative Agent and Lenders (A) may act without liability upon the basis of written or facsimile notice believed by Administrative Agent in good faith to be from Company (or from any Authorized Officer thereof designated in writing purportedly from Company to Administrative Agent),

(B) shall be entitled to rely conclusively on any Authorized Officer's authority to request a Term Loan on behalf of Company until Administrative Agent receives written notice to the contrary, and (C) shall have no duty to verify the authenticity of the signature appearing on any written Funding Notice.

(ii) Each Lender shall make its applicable Term Loan available to Administrative Agent not later than 12:00 p.m. on the applicable Credit Date, by wire transfer of same day funds in Dollars, at Administrative Agent's Principal Office. Upon satisfaction or waiver of the conditions precedent specified herein, Administrative Agent shall make the proceeds of the applicable Term Loans available to Company on the applicable Credit Date by causing an amount of same day funds in Dollars equal to the proceeds of all such Loans received by Administrative Agent from Lenders to be wired to the account of Company at Administrative Agent's Principal Office or to such other account as may be designated in writing to Administrative Agent by Company in the applicable Funding Notice.

(iii) During the Delayed Draw Commitment Period, drawings under the Delayed Draw Term Loan Commitments shall (A) not be made more than once in any Fiscal Quarter on each Interest Payment Date and (B) be applied solely to pay interest on the Loans. The Administrative Agent shall provide notice to the Borrower that the Initial Delayed Draw Term Loans have been funded.

(iv) With respect to any Funding Notice requesting Incremental Term Loans, (i) the Administrative Agent shall promptly forward such Funding Notice to each Lender and (ii) each Lender shall, within fifteen (15) Business Days of receipt of such Funding Notice, elect or decline to commit, on the applicable Credit Date, to provide its Pro Rata Share of such Term Loans. During such fifteen (15) Business Day period, the Borrower shall provide to the Administrative Agent, for distribution to the Lenders, such information as reasonably requested by the Lenders, including, without limitation any information related to the use of funds of such Incremental Term Loans. The making of any Incremental Term Loans will be subject to entering into an amendment to this Agreement that is reasonably acceptable to the Borrower and the Administrative Agent.

(c) Pro Rata Shares; Availability of Funds.

(i) Pro Rata Shares. All Loans (other than the Incremental Term Loans) shall be made by Lenders simultaneously and proportionately to their respective Pro Rata Shares, it being understood that no Lender shall be responsible for any default by any other Lender in such other Lender's obligation to make a Loan requested hereunder nor shall any Term Loan Commitment of any Lender be increased or decreased as a result of a default by any other Lender in such other Lender's obligation to make a Loan requested hereunder or purchase a participation required hereby.

(ii) Availability of Funds. Unless Administrative Agent shall have been notified by any Lender in writing prior to the applicable Credit Date that such Lender does not intend to make available to Administrative Agent the amount of such Lender's Loan requested on such Credit Date, Administrative Agent may assume that such Lender has made such amount available to Administrative Agent on such Credit Date and Administrative Agent may, in its reasonable discretion, but shall not be obligated to, make available to Company a corresponding amount on such Credit Date. If such corresponding amount is not in fact made available to Administrative Agent by such Lender, Administrative Agent shall be entitled to recover such corresponding amount on demand from such Lender together with interest thereon, for each day from such Credit Date until the date such amount is paid to Administrative Agent, at the customary rate set by Administrative Agent for the correction of errors among banks for three Business Days and thereafter at the Prime Rate. If such Lender does not pay such corresponding amount forthwith upon Administrative Agent's demand therefor, Administrative Agent shall promptly notify Company and Company shall immediately pay such corresponding amount to Administrative Agent together with interest thereon, for each day from such Credit Date until the date such amount is paid to

Administrative Agent, at 15% per annum. Nothing in this Section 2.1(c)(ii) shall be deemed to relieve any Lender from its obligation to fulfill its Term Loan Commitments hereunder or to prejudice any rights that Company may have against any Lender as a result of any default by such Lender hereunder.

Section 2.2 Use of Proceeds. The proceeds of the Term Loans shall be applied by Company to fund working capital, capital expenditures and general corporate purposes of Borrower and its Subsidiaries. The proceeds of the Initial Delayed Draw Term Loans made after the Closing Date shall be applied by Company solely to pay interest on the Loans. The Incremental Term Loans made after the Closing Date shall be applied by Company in a manner as agreed upon between the Company and the Administrative Agent. No portion of the proceeds of the Term Loan shall be used in any manner that causes or might cause such Credit Extension or the application of such proceeds to violate Regulation T, Regulation U or Regulation X of the Board of Governors of the Federal Reserve System or any other regulation thereof or to violate the Exchange Act.

Section 2.3 Evidence of Debt; Register; Lenders' Books and Records; Notes.

(a) Lenders' Evidence of Debt. Each Lender shall maintain on its internal records an account or accounts evidencing the Obligations of Company to such Lender, including the amounts of the Term Loans made by it and each repayment and prepayment in respect thereof. Any such recordation shall be conclusive and binding on Company, absent manifest error; provided, that the failure to make any such recordation, or any error in such recordation, shall not affect Company's Obligations in respect of any Term Loans; and provided further, in the event of any inconsistency between the Register and any Lender's records, the recordations in the Register shall govern.

(b) Register. Administrative Agent shall maintain at its Principal Office a register for the recordation of the names and addresses of Lenders and the principal amount of the Term Loans (and stated interest therein) of each Lender from time to time (the "Register"). The Register shall be available for inspection by Company at any reasonable time and from time to time upon reasonable prior written notice. Administrative Agent shall record in the Register the Term Loans (and stated interest thereon), and each repayment or prepayment in respect of the principal amount of the Term Loans, and any such recordation shall be conclusive and binding on Company and each Lender, absent manifest error; provided, failure to make any such recordation, or any error in such recordation, shall not affect Company's Obligations in respect of any Term Loan. Company hereby designates the entity serving as Administrative Agent to serve as Company's non-fiduciary agent solely for purposes of maintaining the Register as provided in this Section 2.3, and Company hereby agrees that, to the extent such entity serves in such capacity, the entity serving as Administrative Agent and its officers, directors, employees, agents and affiliates shall constitute "Indemnitees."

(c) Notes. If so requested by any Lender by written notice to Company (with a copy to Administrative Agent) at least two Business Days prior to the Closing Date, or at any time thereafter, Company shall execute and deliver to such Lender (and/or, if applicable and if so specified in such notice, to any Person who is an assignee of such Lender pursuant to Section 10.6) on the Closing Date (or, if such notice is delivered after the Closing Date, promptly after Company's receipt of such notice) a Note or Notes.

Section 2.4 Interest.

(a) Except as otherwise set forth herein, each Loan shall bear interest at the rate of 15.00% per annum on the unpaid principal amount thereof from the date made through repayment (whether by acceleration or otherwise) thereof.

(b) Interest payable hereunder shall be computed on the basis of a 360 day year, in each case for the actual number of days elapsed in the period during which it accrues. In computing interest on any Loan, the date of the making of such Loan applicable to such Loan, and the date of payment of such Loan shall be excluded; provided, if a Loan is repaid on the same day on which it is made, one day's interest shall be paid on that Loan.

(c) Except as otherwise set forth herein, interest on each Term Loan shall be payable in arrears (i) on each Interest Payment Date and (ii) on the Term Loan Maturity Date; provided that, (A) interest accrued pursuant to Section 2.6 shall be payable on demand and (B) in the event of any repayment or prepayment of any Term Loan, accrued interest and any additional amounts payable pursuant to the terms of the Fee Letter shall be payable on the date of such repayment or prepayment.

Section 2.5 [Reserved].

Section 2.6 Default Interest. Upon the occurrence and during the continuance of an Event of Default under Sections 8.1(a), (f) or (g), and after notice from the Administrative Agent acting at the direction of the Required Lenders, after the occurrence and during the continuance of any other Event of Default retroactive to the date of occurrence of such Event of Default, the principal amount of all Term Loans outstanding and, to the extent permitted by applicable law, any interest payments on the Term Loans or any fees or other amounts owed hereunder (including any MOIC or Yield Maintenance Premium), shall thereafter bear interest (including post petition interest in any proceeding under the Bankruptcy Code or other applicable bankruptcy laws) payable on demand at a rate that is [**]% per annum in excess of the interest rate otherwise payable hereunder with respect to the Term Loans (the "Default Rate"). All interest payable at the Default Rate shall be payable in cash on demand. Payment or acceptance of the Default Rate of interest provided for in this Section 2.6 is not a permitted alternative to timely payment and shall not constitute a waiver of any Default or Event of Default or otherwise prejudice or limit any rights or remedies of Administrative Agent or any Lender.

Section 2.7 Fees.

(a) Company agrees to pay to Administrative Agent all fees payable by it in the Fee Letter in the amounts and at the times specified therein.

(b) All fees referred to in Section 2.7(a) shall be calculated on the basis of a 360 day year and the actual number of days elapsed.

Section 2.8 Repayment of Term Loans. The principal amounts of the Term Loans shall be repaid, together with all other amounts owed hereunder with respect thereto, in full in cash no later than the Term Loan Maturity Date.

Section 2.9 Voluntary Prepayments and Commitment Reductions.

(a) Voluntary Prepayments.

(i) Subject to the terms of the Fee Letter, Company may prepay at any time the Term Loan on any Business Day in whole or in part, in an aggregate minimum amount of $1,000,000 (or the remaining balance of the Term Loans if less) and integral multiples of $1,000,000 in excess of that amount.

(ii) All such prepayments shall be made (A) upon not less than three (3) Business Days' prior written notice given to Administrative Agent by 10:00 a.m. on the date required (and

Administrative Agent will promptly transmit such or original notice by facsimile or email to each Lender). Upon the giving of any such notice, the principal amount of the Term Loans specified in such notice shall become due and payable on the prepayment date specified therein; provided, that any notice of prepayment may be conditioned upon the effectiveness of other credit facilities or any other financing, disposition, sale or other transaction. Any such voluntary prepayment shall be applied as specified in Section 2.11(a) with respect to the Term Loans.

(b) Voluntary Commitment Reductions.

(i) Company may, upon not less than three Business Days' prior written notice confirmed in writing to Administrative Agent (which written notice Administrative Agent will promptly transmit by facsimile or email to each applicable Lender), at any time and from time to time terminate in whole or permanently reduce in part any unused portion of the Delayed Draw Term Loan Commitments; provided, any such partial reduction of the Delayed Draw Term Loan Commitments shall be in an aggregate minimum amount of $1,000,000 (or the remaining balance of the Commitments if less) and integral multiples of $1,000,000 in excess of that amount.

(i) Company's notice to Administrative Agent shall designate the date (which shall be a Business Day) of such termination or reduction and the amount of any partial reduction, and such termination or reduction of the Delayed Draw Term Loan Commitments shall be effective on the date specified in Company's notice and shall reduce the Delayed Draw Term Loan of each Lender proportionately to its Pro Rata Share thereof; provided, that any notice of termination or reduction may be conditioned upon the effectiveness of other credit facilities or any other financing, disposition, sale or other transaction.

(ii) In addition to the foregoing, the Administrative Agent may, at any time and from time to time, reduce the Total Delayed Draw Term Loan Commitment (and the Delayed Draw Term Loan Commitment of each Lender) to an amount which remains sufficient to pay all interest for the remaining term of the Agreement, calculated as of the date of any such reduction.

Section 2.10 Mandatory Prepayments.

(a) [Reserved].

(b) Insurance/Condemnation Proceeds. No later than the [**] following the date of receipt by any Loan Party of any Net Proceeds from insurance payment or any condemnation, taking or other casualty event in excess of $[**] in the aggregate in any Fiscal Year, Company shall prepay the Term Loan as set forth in Section 2.11(a) in an aggregate amount equal to such Net Proceeds in excess of $[**]; provided, (i) so long as no Default or Event of Default shall have occurred and be continuing, (ii) Company has delivered Administrative Agent prior written notice of Company's intention to apply such Net Proceeds (the "Reinvestment Amounts") to the costs of research, development, manufacturing, Commercialization, license, purchase, or other acquisition or investment of or in other assets or Products used or useful in the business of the Loan Parties, including working capital, capital expenditures and Permitted Acquisitions (the "Permitted Reinvestment Purposes"), (iii) the monies are held in a Deposit Account or Securities Account in which the Administrative Agent has a perfected first-priority security interest, and (iv) the Loan Parties complete such cost payment, reinvestment or purchase within [**] after the initial receipt of such monies, the Loan Parties shall have the option to apply such Reinvestment Amounts to any Permitted Reinvestment Purposes in an aggregate amount not to exceed (1) $[**] in respect of any individual event and (2) $[**] in the aggregate during the term of this Agreement; provided, that if any such Net Proceeds are no longer intended to be or cannot be so reinvested during the applicable [**] period, an amount equal to any such Net Proceeds shall be applied within [**] after Borrower reasonably determines that such Net

Proceeds are no longer intended to be or cannot be so reinvested to the prepayment of the Term Loans as set forth in Section 2.11(a).

(c) Issuance of Debt. On the date of receipt by Borrower or any of its Subsidiaries of any Cash proceeds from the incurrence of any Indebtedness of Borrower or any of its Subsidiaries (other than with respect to any Indebtedness permitted to be incurred pursuant to Section 6.1), Company shall prepay the Loans in an aggregate amount equal to [**]% of such proceeds, net of underwriting discounts and commissions and other reasonable costs and expenses associated therewith, in each case, paid to non-Affiliates, including reasonable legal fees and expenses.

(d) Extraordinary Receipts. On the date of receipt by or on behalf of any Loan Party of any Net Proceeds from any Extraordinary Receipts in excess of $[**] in the aggregate in any Fiscal Year, the Borrower shall prepay the Term Loan as set forth in Section 2.11(a) in the amount of such Extraordinary Receipts in excess of $[**]; provided, (i) so long as no Default or Event of Default shall have occurred and be continuing, (ii) the Borrower has delivered Administrative Agent prior written notice of the Borrower's intention to apply the Reinvestment Amounts to Permitted Reinvestment Purposes, (iii) the monies are held in a Deposit Account or Securities Account in which the Administrative Agent has a perfected first-priority security interest, and (iv) the Loan Parties complete such purchase within [**] after the initial receipt of such monies, the Borrower shall have the option to apply such Reinvestment Amounts to any Permitted Reinvestment Purpose in an aggregate amount not to exceed (A) $[**] in respect of any individual Extraordinary Receipt and (B) $[**] in the aggregate for all Extraordinary Receipts during the term of this Agreement; provided, that if any such Net Proceeds are no longer intended to be or cannot be so reinvested during the applicable [**] period, an amount equal to any such Net Proceeds shall be applied within [**] after Borrower reasonably determines that such Net Proceeds are no longer intended to be or cannot be so reinvested to the prepayment of the Term Loans as set forth in Section 2.11(a).

(e) Partnered Assets. No later than [**] following the date of receipt of any Joint Venture Proceeds or consideration for the Capital Stock of a Joint Venture by or on behalf of any Loan Party, or with respect to Product Revenue, Royalties, Milestones and Profit Share Amounts, [**] following the last day of each Fiscal Quarter, the Borrower shall prepay the Term Loan as set forth in Section 2.11(a) in an amount equal to:

(x) [**]% of (i) Product Revenues (excluding sales of Product by a Licensee), (ii) Joint Venture Proceeds, and (iii) any Profit Share Amounts, in each case generated or received by the Loan Parties in respect of the Partnered Assets (other than amounts set forth in clause (y));

(y) [**]% of any Royalties and Milestones;

in the case of clauses (x) and (y), to the extent attributable to the research, development, manufacture and/or Commercialization of any Partnered Asset (including any Pipeline Asset after it becomes subject to a consummated Specified Transaction described in Section 6.9(b)(xviii)); provided that, with respect to Fazirsiran, on a Fiscal Quarter-by-Fiscal Quarter basis, in each case (x) and (y) above, Borrower shall prepay the Term Loan in an amount equal to the *lesser* of (A) [**], and (B) [**]. For the avoidance of doubt, any Fazirsiran Payment Shortfall Amount that is not prepaid in a Fiscal Quarter shall be carried over to the subsequent Fiscal Quarter unless the Fazirsiran Payment Shortfall Amount is zero); and

provided further that, with respect to Olpasiran, the prepayments with respect to Royalties in (y) shall, with respect to Royalties that were sold to RPI under the RPI Agreement, instead include [**]% of all RPI Milestones, if any, received by the Loan Parties, and the other amounts in (x) and (y) shall remain as set forth above; and

(z) [**]% of the Net Proceeds received in connection with the sale, liquidation or disposition of any Capital Stock of a Joint Venture.

(f) Zodasiran. In connection with the development, manufacture and/or Commercialization of Zodasiran by or on behalf of Borrower, its Subsidiaries, and their respective Licensees (including under any Permitted Zodasiran Agreement described in Section 6.9(b)(xix)), subject to Section 2.10(f)(A) below, the Borrower shall prepay the Term Loan as set forth in Section 2.11(a) in an amount equal to (x) [**]% of any Royalties and Milestones under any Permitted Zodasiran Agreement, (y) [**]% of (i) Product Revenues (excluding sales of Product by a Licensee), (ii) Joint Venture Proceeds, and (iii) Profit Share Amounts, in each case (y)(i)-(iii), generated or received by or on behalf of the Loan Parties in respect of the Zodasiran (other than amounts set forth in subclause (z) of this Section 2.10(f)) and (z) [**]% of any Zodasiran Upfront Payment (provided that the prepayment amount under this item (z) shall not exceed $[**] or if the Permitted Zodasiran Agreement is effected after [**] after the Closing Date and prior to [**] the Closing Date, $[**]), which, (A) with respect to subclause (x) of this Section 2.10(f), shall be payable within [**] after receipt thereof by or on behalf of the Borrower or any of its Subsidiaries and (B) with respect to subclause (y) of this Section 2.10(f), shall be payable within [**] following the last day of each Fiscal Quarter, and (C) with respect to subclause (z) of this Section 2.10(f), shall be payable as follows: (1) if the Market Capitalization Milestone is not satisfied on the date of receipt thereof, within [**] following the date of receipt thereof by or on behalf of any Loan Party and (2) if the Market Capitalization Milestone is satisfied on the date of receipt thereof by any Loan Party and remains satisfied while there is a Zodasiran Upfront Payment Balance outstanding, the Zodasiran Upfront Payment shall be paid in four equal installments (any outstanding balances owed at any time, the "Zodasiran Upfront Payment Balance") as follows: (a) the first installment shall be payable within [**] after receipt of such Zodasiran Upfront Payment by or on behalf of the Borrower or any of its Subsidiaries, (b) the second installment shall be payable on the date that is [**] of the receipt of such Zodasiran Upfront Payment by or on behalf of the Borrower or any of its Subsidiaries, (c) the third installment shall be payable on the date that is [**] of the receipt of such Zodasiran Upfront Payment by or on behalf of the Borrower or any of its Subsidiaries, and (d) the fourth installment shall be payable on the date that is the [**] of the receipt of such Zodasiran Upfront Payment by or on behalf of the Borrower or any of its Subsidiaries; provided that, if at any time the Market Capitalization Milestone is not satisfied while there is a Zodasiran Upfront Payment Balance outstanding, the entire Zodasiran Upfront Payment Balance shall become due and payable immediately.

(g) Plozasiran. In connection with the Commercialization of Plozasiran by Borrower and its Subsidiaries, Borrower shall prepay the Term Loan as set forth in Section 2.11(a) in an amount equal to [**]% of Global Net Sales of Plozasiran in such Fiscal Quarter, which shall be payable within [**] following the last day of each Fiscal Quarter.

(h) Pipeline Assets. (A) No later than [**] following the date of receipt by any Loan Party of any Net Proceeds from any Pipeline Asset Monetization (including, for the avoidance of doubt, any Pipeline Asset Monetization with respect to a Product that was the subject of a Specified Transaction as of the Closing Date but that is not consummated within the time period set forth in subsection (c) of the definition of "Specified Transaction") that, together with all Net Proceeds from such Pipeline Asset Monetization received by all Loan Parties since the Closing Date, are in excess of (x) $[**] individually for each Product included in such Pipeline Asset Monetization transaction or (y) $[**] in the aggregate for all Products in all Pipeline Asset Monetization transactions, Company shall prepay the Term Loan as set forth in Section 2.11(a) in an amount equal to (i) [**]% of such Net Proceeds (the "Pipeline Percentage"); provided that, (A) if, on the closing date of such Pipeline Asset Monetization, (1) the Company has Qualified Cash in excess of $[**] and (2) prior to the date that is the [**] the Closing Date, the Lenders have earned and been paid (without (a) receipt of the True Up Payment or (b) including any optional prepayment pursuant to Section 2.9(a)(i) in such calculation) an amount equal to or greater than a MOIC of [**] times the principal amount of the Initial Term Loan but less than a MOIC of [**] times the principal

amount of the Initial Term Loan, the Pipeline Percentage shall be reduced to [**]% of such Net Proceeds and (B) if, on the date of closing of such Pipeline Asset Monetization, the Company has Qualified Cash in excess of $[**], the Lenders have earned and been paid (without (a) receipt of the True Up Payment or (b) including any optional prepayment pursuant to Section 2.9(a)(i) in such calculation) an amount equal to or greater than a MOIC of [**] times the principal amount of the Initial Term Loan, the Pipeline Percentage shall be reduced to [**]% of such Net Proceeds. For the avoidance of doubt, any Asset Sale of Plozasiran, any Asset Sale of Zodasiran and any upfront fee received in connection with a Specified Transaction shall not be subject to this Section 2.10(h).

(i) Other Products. (A) With respect to any Product (excluding (i) Plozasiran, (ii) Zodasiran, (iii) any Partnered Asset and (iv) any amounts received in connection with transactions for which prepayments are required to be made and are made pursuant to Section 2.10(e) through (h) above and clause (j) below), no later than [**] following the last day of each Fiscal Quarter following the Closing Date (or if later, within [**] following the end of the month during which the relevant payments are received), Company shall prepay the Term Loan as set forth in Section 2.11(a) in an amount equal to [**]% of Global Net Sales of such Product for such Fiscal Quarter. (B) With respect to third party products manufactured by the Loan Parties solely on a contract manufacturing basis for a third party that is not a Licensee, an amount equal to [**]% of net revenue received by a Loan Party in connection with such manufacture within [**] following the end of the calendar month in which such net revenue is received.

(j) Royalty Reductions and Milestone Reductions. If a counterparty to the Takeda License Agreement exercises any Reduction against any payment of any Royalties, Milestones, Sublicense Revenue, Profit Share Amounts or Joint Venture Proceeds, other than for a Permitted Reduction, Borrower shall promptly (and in any event within [**] following receipt of the royalty report or other report affected by such Reduction) make a true-up payment to the Administrative Agent such that the Administrative Agent receives the full amount of the Royalties, Milestones, Sublicense Revenue, Profit Share Amounts and Joint Venture Proceeds that would have been payable to the Administrative Agent had such Reduction not occurred.

(k) Prepayment Certificate. Concurrently with any prepayment of the Term Loan pursuant to Section 2.10(a) through Section 2.10(j), Company shall deliver to Administrative Agent a certificate of an Authorized Officer demonstrating the calculation of the amount of the applicable proceeds and compensation owing to Lenders pursuant to the Fee Letter, if any, as the case may be. In the event that Company shall subsequently determine that the actual amount received exceeded the amount set forth in such certificate, Company shall promptly make an additional prepayment of the Loans, and Company shall concurrently therewith deliver to Administrative Agent a certificate of an Authorized Officer demonstrating the derivation of such excess.

Section 2.11 Application of Prepayments.

(a) Application of Prepayments of Term Loans. (i) Any prepayment of the Term Loan pursuant to Section 2.9 and (ii) so long as no Application Event has occurred and is continuing, any mandatory prepayment of any Loan pursuant to Section 2.10, in each case, shall be applied as follows:

first, (i) if the prepayment will not result in a full prepayment of all outstanding Term Loans, ratably to prepay the principal of the Term Loan and (ii) if the prepayment will result in a full prepayment of all outstanding Term Loans, ratably to prepay the principal of the Term Loans, together with any fees payable under the Fee Letter relating to such prepayment, until paid in full;

second, to prepay accrued and Unpaid Interest on the Term Loan;

(b) [Reserved].

(c) At any time an Application Event has occurred and is continuing, all payments shall be applied pursuant to Section 2.12(f). Nothing contained herein shall modify the provisions of Section 2.12(b) regarding the requirement that all prepayments be accompanied by accrued interest and fees on the principal amount being prepaid to the date of such prepayment and the applicable MOIC or Yield Maintenance Premium, or any requirement otherwise contained herein to pay all other amounts as the same become due and payable.

Section 2.12 General Provisions Regarding Payments.

(a) All payments by Company of principal, interest, fees and other Obligations shall be made in Dollars in immediately available funds, without defense, recoupment, setoff or counterclaim, free of any restriction or condition, and delivered to Administrative Agent, for the account of Lenders, not later than 3:00 p.m. (New York City time) on the date such payment is due and payable to Administrative Agent's Account. Funds received by Administrative Agent after that time on such due date shall be deemed to have been paid by Company on the next Business Day.

(b) All payments in respect of the principal amount of any Term Loan shall be accompanied by payment of accrued interest on the principal amount being repaid or prepaid, the MOIC, the Yield Maintenance Premium and all commitment fees and other amounts payable with respect to the principal amount being repaid or prepaid.

(c) Administrative Agent shall promptly distribute to each Lender at such address as such Lender shall indicate in writing, such Lender's applicable Pro Rata Share of all payments and prepayments of principal and interest due hereunder, together with all other amounts due with respect thereto, including, without limitation, all fees payable with respect thereto, to the extent received by Administrative Agent.

(d) Whenever any payment to be made hereunder shall be stated to be due on a day that is not a Business Day, such payment shall be made on the next succeeding Business Day and such extension of time shall be included in the computation of the payment of interest hereunder or of the commitment fees hereunder.

(e) Administrative Agent shall deem any payment by or on behalf of Company hereunder that is not made in same day funds prior to 3:00 p.m. to be a non-conforming payment. Any such payment shall not be deemed to have been received by Administrative Agent until the later of (i) the time such funds become available funds, and (ii) the applicable next Business Day. Administrative Agent shall give prompt notice to Company and each applicable Lender (confirmed in writing) if any payment is non-conforming. Interest shall continue to accrue on any principal as to which a non-conforming payment is made until such funds become available funds (but in no event less than the period from the date of such payment to the next succeeding applicable Business Day) at the Default Rate determined pursuant to Section 2.6 from the date such amount was due and payable until the date such amount is paid in full.

(f) At any time an Application Event has occurred and is continuing, or the maturity of the Obligations shall have been accelerated pursuant to Section 8.2, all payments or proceeds received by Administrative Agent hereunder or under any Collateral Document in respect of any of the Obligations, including, but not limited to all proceeds received by Administrative Agent in respect of any sale, any collection from, or other realization upon all or any part of the Collateral, shall be applied in full or in part as follows:

first, ratably to pay the Obligations in respect of any fees (other than any Yield Maintenance Premium), expense reimbursements, indemnities and other amounts then due and payable to Administrative Agent until paid in full;

second, ratably to pay interest then due and payable in respect of Protective Advances until paid in full;

third, ratably to pay principal of Protective Advances then due and payable until paid in full;

fourth, ratably to pay the Obligations in respect of any fees (other than any Yield Maintenance Premium) and indemnities then due and payable to the Lenders with a Term Loan Commitment until paid in full;

fifth, ratably to pay interest then due and payable in respect of the Term Loan until paid in full;

sixth, ratably to pay the principal of the Term Loan until paid in full;

seventh, ratably to pay the Obligations in respect of any Yield Maintenance Premium then due and payable to the Lenders with a Term Loan until paid in full; and

eighth, to the ratable payment of all other Obligations then due and payable until paid in full.

(g) For purposes of Section 2.12(f) (other than clause eighth of Section 2.12(f)), "paid in full" means payment in cash of all amounts owing under the Loan Documents according to the terms thereof, including loan fees, service fees, professional fees, interest (and specifically including interest accrued after the commencement of any Insolvency Proceeding), default interest, interest on interest, and expense reimbursements, whether or not same would be or is allowed or disallowed in whole or in part in any Insolvency Proceeding, except to the extent that default or overdue interest (but not any other interest) and loan fees, each arising from or related to a default, are disallowed in any Insolvency Proceeding; provided, however, that for purposes of clause eighth of Section 2.12(f), "paid in full" means payment in cash of all amounts owing under the Loan Documents according to the terms thereof, including loan fees, service fees, professional fees, interest (and specifically including interest accrued after the commencement of any Insolvency Proceeding), default interest, interest on interest, and expense reimbursements, whether or not the same would be or is allowed or disallowed in whole or in part in any Insolvency Proceeding.

(h) In the event of a direct conflict between the priority provisions of Section 2.12(f) and other provisions contained in any other Loan Document, it is the intention of the parties hereto that both such priority provisions in such documents shall be read together and construed, to the fullest extent possible, to be in concert with each other. In the event of any actual, irreconcilable conflict that cannot be resolved as aforesaid, the terms and provisions of Section 2.12(f) shall control and govern.

(i) The Lenders and Company hereby authorize Administrative Agent to, and Administrative Agent may, from time to time during the continuance of an Event of Default, charge the Loan Account with any amount due and payable by Company under any Loan Document to the extent not paid when due. Each of the Lenders and Company agrees that Administrative Agent shall have the right to make such charges whether or not any of the conditions precedent in Section 3.2 have been satisfied. Any amount charged to the Loan Account shall be deemed a Loan hereunder made by the Lenders to Company, funded by Administrative Agent on behalf of the Lenders and subject to Section 2.2. The Lenders and

Company confirm that any charges which Administrative Agent may so make to the Loan Account as herein provided will be made as an accommodation to Company and solely at Administrative Agent's discretion, provided that Administrative Agent shall from time to time upon the request of Administrative Agent, charge the Loan Account of Company with any amount due and payable under any Loan Document. The Administrative Agent shall provide a reasonably detailed invoice for any amounts charged to the Loan Account (unless such charge is made at the Company's request) promptly upon request by the Company.

Section 2.13 Ratable Sharing. Lenders hereby agree among themselves that, except as otherwise provided in the Collateral Documents with respect to amounts realized from the exercise of rights with respect to Liens on the Collateral, if any of them shall, whether by voluntary payment (other than a voluntary prepayment of Term Loans made and applied in accordance with the terms hereof), through the exercise of any right of set off or banker's lien, by counterclaim or cross action or by the enforcement of any right under the Loan Documents or otherwise, or as adequate protection of a deposit treated as cash collateral under the Bankruptcy Code, receive payment or reduction of a proportion of the aggregate amount of principal, interest, fees and other amounts then due and owing to such Lender hereunder or under the other Loan Documents (collectively, the "Aggregate Amounts Due" to such Lender) which is greater than the proportion received by any other Lender in respect of the Aggregate Amounts Due to such other Lender having Term Loans, then the Lender receiving such proportionately greater payment shall (a) notify Administrative Agent and each other Lender of the receipt of such payment and (b) apply a portion of such payment to purchase participations (which it shall be deemed to have purchased from each seller of a participation simultaneously upon the receipt by such seller of its portion of such payment) in the Aggregate Amounts Due to the other Lenders so that all such recoveries of Aggregate Amounts Due shall be shared by all Lenders having Term Loans in proportion to the Aggregate Amounts Due to them; provided, if all or part of such proportionately greater payment received by such purchasing Lender is thereafter recovered from such Lender upon the bankruptcy or reorganization of Company or otherwise, those purchases shall be rescinded and the purchase prices paid for such participations shall be returned to such purchasing Lender ratably to the extent of such recovery, but without interest. Company expressly consents to the foregoing arrangement and agrees that any holder of a participation so purchased may exercise any and all rights of banker's lien, set off or counterclaim with respect to any and all monies owing by Company to that holder with respect thereto as fully as if that holder were owed the amount of the participation held by that holder.

Section 2.14 Increased Costs; Capital Adequacy.

(a) Compensation For Increased Costs and Taxes. Subject to the provisions of Section 2.15 (which shall be controlling with respect to the matters covered thereby), in the event that Administrative Agent or any Lender shall determine (which determination shall, absent manifest error, be final and conclusive and binding upon all parties hereto) that any law, treaty or governmental rule, regulation or order, or any change therein or in the interpretation, administration or application thereof (including the introduction of any new law, treaty or governmental rule, regulation or order), or any determination of a court or Governmental Authority, in each case that becomes effective after the date hereof, or compliance by Administrative Agent or such Lender with any guideline, request or directive issued or made after the date hereof by any central bank or other governmental or quasi-Governmental Authority (whether or not having the force of law): (i) subjects Administrative Agent or such Lender (or its applicable lending office) to any additional Tax (other than (A) Indemnified Taxes, (B) Taxes described in clauses (ii) through (iv) of the definition of Excluded Taxes and (C) Connection Income Taxes) with respect to this Agreement or any of the other Loan Documents or any of its obligations hereunder or thereunder or any payments to Administrative Agent or such Lender (or its applicable lending office) of principal, interest, fees or any other amount payable hereunder; (ii) imposes, modifies or holds applicable any reserve (including any marginal, emergency, supplemental, special or other reserve), special deposit, compulsory loan, FDIC insurance or similar requirement against assets held by, or deposits or other liabilities in or for the account of, or advances or loans by, or other credit extended by, or any other

acquisition of funds by, any office of Administrative Agent or such Lender; or (iii) imposes any other condition (other than with respect to Taxes) on or affecting Administrative agent or such Lender (or its applicable lending office) or its obligations hereunder; and the result of any of the foregoing is to increase the cost to Administrative Agent or such Lender of agreeing to make, making or maintaining Loans hereunder or to reduce any amount received or receivable by Administrative Agent or such Lender (or its applicable lending office) with respect thereto; then, in any such case, Company shall promptly pay to Administrative Agent or such Lender, upon receipt of the statement referred to in the next sentence, such additional amount or amounts (in the form of an increased rate of, or a different method of calculating, interest or otherwise as Administrative Agent or such Lender in its reasonable discretion shall determine) as may be necessary to compensate Administrative Agent or such Lender for any such increased cost or reduction in amounts received or receivable hereunder. Administrative Agent or such Lender shall deliver to Company (with a copy to Administrative Agent, if applicable) a written statement, setting forth in reasonable detail the basis for calculating the additional amounts owed to Administrative Agent or such Lender under this Section 2.14(a), which statement shall be conclusive and binding upon all parties hereto absent manifest error.

(b) Capital Adequacy Adjustment. In the event that any Lender shall have determined that the adoption, effectiveness, phase in or applicability after the Closing Date of any law, rule or regulation (or any provision thereof) regarding capital adequacy, or any change therein or in the interpretation or administration thereof by any Governmental Authority, central bank or comparable agency charged with the interpretation or administration thereof, or compliance by any Lender (or its applicable lending office) with any guideline, request or directive regarding capital adequacy (whether or not having the force of law) of any such Governmental Authority, central bank or comparable agency, has or would have the effect of reducing the rate of return on the capital of such Lender or any corporation controlling such Lender as a consequence of, or with reference to, such Lender's Term Loans or other obligations hereunder with respect to the Term Loan to a level below that which such Lender or such controlling corporation could have achieved but for such adoption, effectiveness, phase in, applicability, change or compliance (taking into consideration the policies of such Lender or such controlling corporation with regard to capital adequacy), then from time to time, within [**] after receipt by Company from such Lender of the statement referred to in the next sentence, Company shall pay to such Lender such additional amount or amounts as will compensate such Lender or such controlling corporation on an after tax basis for such reduction. Such Lender shall deliver to Company (with a copy to Administrative Agent) a written statement, setting forth in reasonable detail the basis for calculating the additional amounts owed to Lender under this Section 2.14(b), which statement shall be conclusive and binding upon all parties hereto absent manifest error.

Section 2.15 Taxes; Withholding, Etc.

(a) Withholding of Taxes. All sums payable by any Loan Party hereunder and under the other Loan Documents shall (except to the extent required by law) be paid free and clear of, and without any deduction or withholding on account of, any Tax, other than (i) Taxes imposed on or measured by the recipient's net income (however denominated), branch profits Taxes and franchise Taxes imposed on the recipient, in each case, (A) by the jurisdiction (or any political subdivision thereof) under the laws of which such recipient is organized or in which its principal office is located or, in the case of any Lender, in which its applicable lending office is located or (B) as the result of any other present or former connection between such recipient and the jurisdiction imposing such Tax (other than connections arising from such recipient having executed, delivered, become a party to, performed its obligations under, received payments under, received or perfected a security interest under, engaged in any other transaction pursuant to or enforced any Loan Document) (all such Taxes described in clause (B), "Other Connection Taxes"), (ii) in the case of a Lender, U.S. federal withholding Taxes imposed on amounts payable to or for the account of such Lender with respect to an applicable interest in a Loan or commitment hereunder pursuant to a law in effect on the date on which (x) such Lender acquires such interest in the Loan or commitment hereunder (other than

pursuant to an assignment request by the Borrower under Section 2.18) or (y) such Lender changes its lending office, except in each case to the extent that, pursuant to this Section 2.15, amounts with respect to such Taxes were payable either to such Lender's assignor immediately before such Lender became a party hereto or to such Lender immediately before it changed its lending office, (iii) Taxes attributable to such Lender's failure to comply with Section 2.15(d) and (iv) any withholding Taxes imposed under FATCA (all such Taxes described in clauses (i) through (iv), collectively or individually, "Excluded Taxes"). If any Loan Party or any other Person is required by law to make any deduction or withholding on account of any Tax from any sum paid or payable by any Loan Party to Administrative Agent or any Lender under any of the Loan Documents: (1) Company shall notify Administrative Agent of any such requirement or any change in any such requirement as soon as Company becomes aware of it; (2) Company shall timely pay the full amount of any such Tax to the relevant Governmental Authority before the date on which penalties attach thereto, such payment to be made (if the liability to pay is imposed on any Loan Party) for its own account or (if that liability is imposed on Administrative Agent or such Lender, as the case may be) on behalf of and in the name of Administrative Agent or such Lender; (3) if such Tax is an Indemnified Tax, then the sum payable by such Loan Party shall be increased to the extent necessary to ensure that, after the making of that deduction, withholding or payment (including any such deductions, withholdings or payments applicable to additional sums payable under this Section 2.15), Administrative Agent or such Lender, as the case may be, receives on the due date a net sum equal to what it would have received had no such deduction, withholding or payment been required or made; and (4) within [**] after paying any sum from which it is required by law to make any deduction or withholding, Company shall deliver to Administrative Agent the original or a certified copy of a receipt issued by such Governmental Authority evidencing such deduction, withholding or payment, a copy of the return reporting such withholding, deduction or payment, or other evidence satisfactory to Administrative Agent of such deduction, withholding or payment and of the remittance thereof to the relevant Governmental Authority.

(b) Other Taxes. The Loan Parties shall pay to the relevant Governmental Authorities (or, at the option of Administrative Agent, timely reimburse it for the payment of) any present or future stamp, court, documentary, intangible, recording, filing or similar Taxes or any other excise or property Taxes that arise from any payment made hereunder or from the execution, delivery, performance, enforcement or registration of, from the receipt or perfection of a security interest under, or otherwise with respect to, this Agreement or any other Loan Document, except any such Taxes that are Other Connection Taxes imposed with respect to an assignment (other than an assignment made pursuant to Section 2.18) ("Other Taxes"). Within [**] after paying any such Other Taxes, each Loan Party shall deliver to Administrative Agent the original or a certified copy of a receipt issued by such Governmental Authority evidencing such payment, a copy of the return reporting such payment, or other evidence satisfactory to Administrative Agent that such Other Taxes have been paid to the relevant Governmental Authority.

(c) Tax Indemnification.

(i) The Loan Parties hereby jointly and severally indemnify and agree to hold Administrative Agent and any Lender harmless from and against the full amount of all Indemnified Taxes (including, without limitation, Indemnified Taxes imposed or asserted on or attributable to any amounts payable under this Section 2.15) payable or paid by such Person or required to be withheld or deducted from a payment to such Person and any reasonable expenses arising therefrom or with respect thereto, whether or not such Indemnified Taxes were correctly or legally imposed or asserted by the relevant Governmental Authority. Such indemnification shall be paid within [**] from the date on which Administrative Agent or Lender makes written demand therefor. A certificate as to the amount of such payment or liability delivered to Borrower by a Lender (with a copy to Administrative Agent), or by Administrative Agent on its own behalf or on behalf of a Lender, shall be conclusive absent manifest error.

(ii) Each Lender shall severally indemnify Administrative Agent, within [**] after demand therefor, for (i) any Indemnified Taxes attributable to such Lender (but only to the extent that the Loan Parties have not already indemnified Administrative Agent for such Indemnified Taxes and without limiting the obligation of the Loan Parties to do so), (ii) any Taxes attributable to such Lender's failure to comply with the provisions of Section 10.6(h)(ii) relating to the maintenance of a Participant Register and (iii) any Excluded Taxes attributable to such Lender, in each case, that are payable or paid by Administrative Agent in connection with any Loan Document, and any reasonable expenses arising therefrom or with respect thereto, whether or not such Taxes were correctly or legally imposed or asserted by the relevant Governmental Authority. A certificate as to the amount of such payment or liability delivered to any Lender by Administrative Agent shall be conclusive absent manifest error. Each Lender hereby authorizes Administrative Agent to set off and apply any and all amounts at any time owing to such Lender under any Loan Document or otherwise payable by Administrative Agent to the Lender from any other source against any amount due to Administrative Agent under this paragraph.

(d) Evidence of Exemption From Withholding Tax.

(i) Any Lender that is entitled to an exemption from or reduction of withholding Tax with respect to payments made under any Loan Document shall deliver to Borrower and Administrative Agent, at the time or times reasonably requested by Borrower or the Administrative Agent, such properly completed and executed documentation reasonably requested by Borrower or Administrative Agent as will permit such payments to be made without withholding or at a reduced rate of withholding. In addition, any Lender, if reasonably requested by Borrower or Administrative Agent, shall deliver such other documentation prescribed by applicable law or reasonably requested by Borrower or Administrative Agent as will enable Borrower or Administrative Agent to determine whether or not such Lender is subject to backup withholding or information reporting requirements. Notwithstanding anything to the contrary in the preceding two sentences, the completion, execution and submission of such documentation (other than such documentation set forth in Section 2.15(d)(i)(A), (i)(B) and (i)(D)) shall not be required if in the Lender's reasonable judgment such completion, execution or submission would subject such Lender to any material unreimbursed cost or expense or would materially prejudice the legal or commercial position of such Lender. Without limiting the generality of the foregoing, in the event that Borrower is a U.S. Person:

(A) any Lender that is a U.S. Person shall deliver to Borrower and Administrative Agent on or about the date on which such Lender becomes a Lender under this Agreement (and from time to time thereafter upon the reasonable request of Borrower or Administrative Agent), executed copies of IRS Form W-9 certifying that such Lender is exempt from U.S. federal backup withholding tax;

(B) any Foreign Lender shall, to the extent it is legally entitled to do so, deliver to Borrower and Administrative Agent (in such number of copies as shall be requested by the recipient) on or about the date on which such Foreign Lender becomes a Lender under this Agreement (and from time to time thereafter upon the reasonable request of Borrower or Administrative Agent), whichever of the following is applicable:

(1) in the case of a Foreign Lender claiming the benefits of an income tax treaty to which the United States is a party (x) with respect to payments of interest under any Loan Document, executed copies of IRS Form W-8BEN or IRS Form W-8BEN-E establishing an exemption from, or reduction of, U.S. federal withholding Tax pursuant to the "interest" article of such tax treaty and (y) with respect to any other applicable payments under any Loan Document, IRS Form W-8BEN or IRS Form

W-8BEN-E establishing an exemption from, or reduction of, U.S. federal withholding Tax pursuant to the "business profits" or "other income" article of such tax treaty;

(2) executed copies of IRS Form W-8ECI;

(3) in the case of a Foreign Lender claiming the benefits of the exemption for portfolio interest under Section 881(c) of the Internal Revenue Code, (x) a certificate substantially in the form of Exhibit G-1 to the effect that such Foreign Lender is not a "bank" within the meaning of Section 881(c)(3)(A) of the Code, a "10 percent shareholder" of Borrower within the meaning of Section 871(h)(3)(B) of the Internal Revenue Code, or a "controlled foreign corporation" related to any Loan Party described in Section 881(c)(3)(C) of the Internal Revenue Code (a "U.S. Tax Compliance Certificate") and (y) executed copies of IRS Form W-8BEN or IRS Form W-8BEN-E; or

(4) to the extent a Foreign Lender is not the beneficial owner, executed copies of IRS Form W-8IMY, accompanied by IRS Form W-8ECI, IRS Form W-8BEN, IRS Form W-8BEN-E, a U.S. Tax Compliance Certificate substantially in the form of Exhibit G-2 or Exhibit G-3, IRS Form W-9, and/or other certification documents from each beneficial owner, as applicable; provided that if the Foreign Lender is a partnership and one or more direct or indirect partners of such Foreign Lender are claiming the portfolio interest exemption, such Foreign Lender may provide a U.S. Tax Compliance Certificate substantially in the form of Exhibit G-4 on behalf of each such direct and indirect partner;

(ii) any Foreign Lender shall, to the extent it is legally entitled to do so, deliver to Borrower and Administrative Agent (in such number of copies as shall be requested by the recipient) on or about the date on which such Foreign Lender becomes a Lender under this Agreement (and from time to time thereafter upon the reasonable request of Borrower or Administrative Agent), executed copies of any other form prescribed by applicable law as a basis for claiming exemption from or a reduction in U.S. federal withholding Tax, duly completed, together with such supplementary documentation as may be prescribed by applicable law to permit Borrower or Administrative Agent to determine the withholding or deduction required to be made; and

(iii) If a payment made to a Lender under any Loan Document would be subject to United States federal withholding Tax imposed by FATCA if such Lender were to fail to comply with the applicable reporting requirements of FATCA (including those contained in Section 1471(b) or 1472(b) of the Internal Revenue Code, as applicable), such Lender shall deliver to Company and Administrative Agent at the time or times prescribed by law and at such time or times reasonably requested by Company or Administrative Agent such documentation prescribed by applicable law (including as prescribed by Section 1471(b)(3)(C)(i) of the Internal Revenue Code) and such additional documentation reasonably requested by Company or Administrative Agent as may be necessary for Company and Administrative Agent to comply with their obligations under FATCA and to determine that such Lender has complied with such Lender's obligations under FATCA or to determine the amount to deduct and withhold from such payment. Solely for purposes of this Section 2.15(d)(i)(A), FATCA shall include any amendments made to FATCA after the date of this Agreement. Notwithstanding the above, a Lender shall not be required to deliver any form or other form of documentation pursuant to this Section 2.15(d)(i)(A) that such Lender is not legally able to deliver. Each Lender agrees that if any form or certification it previously delivered

expires or becomes obsolete or inaccurate in any respect, it shall update such form or certification or promptly notify Borrower and Administrative Agent of its legal inability to do so.

(e) Treatment of Certain Refunds. If any party determines, in its reasonable discretion exercised in good faith, that it has received a refund of any Taxes as to which it has been indemnified pursuant to this Section 2.15 (including by the payment of additional amounts pursuant to this Section 2.15), it shall pay to the indemnifying party an amount equal to such refund (but only to the extent of indemnity payments made under this Section with respect to the Taxes giving rise to such refund), net of all out-of-pocket expenses (including Taxes) of such indemnified party and without interest (other than any interest paid by the relevant Governmental Authority with respect to such refund). Such indemnifying party, upon the request of such indemnified party, shall repay to such indemnified party the amount paid over pursuant to this Section 2.15(e) (plus any penalties, interest or other charges imposed by the relevant Governmental Authority) in the event that such indemnified party is required to repay such refund to such Governmental Authority. Notwithstanding anything to the contrary in this Section 2.15(e), in no event will the indemnified party be required to pay any amount to an indemnifying party pursuant to this Section 2.15(e) the payment of which would place the indemnified party in a less favorable net after-Tax position than the indemnified party would have been in if the Tax subject to indemnification and giving rise to such refund had not been deducted, withheld or otherwise imposed and the indemnification payments or additional amounts with respect to such Tax had never been paid. This paragraph shall not be construed to require any indemnified party to make available its Tax returns (or any other information relating to its Taxes that it deems confidential) to the indemnifying party or any other Person.

(f) Survival. Each party's obligations under this Section 2.15 shall survive the resignation or replacement of Administrative Agent or any assignment of rights by, or the replacement of, a Lender, the termination of the Term Loans, and the repayment, satisfaction, or discharge of all obligations under any Loan Document.

Section 2.16 Obligation to Mitigate. Each Lender agrees that, as promptly as practicable after the officer of such Lender responsible for administering its Term Loans becomes aware of the occurrence of an event or the existence of a condition that would cause such Lender to become an Affected Lender or that would entitle such Lender to receive payments under Section 2.13, 2.14 or 2.15, it will (at the request of Borrower) use reasonable efforts to (a) make, issue, fund or maintain its Credit Extensions, including any Affected Loans, through another office of such Lender, or (b) take such other measures as such Lender may deem reasonable, if as a result thereof the circumstances which would cause such Lender to be an Affected Lender would cease to exist or the additional amounts which would otherwise be required to be paid to such Lender pursuant to Section 2.13, 2.14 or 2.15 would be reduced and if, as determined by such Lender in its reasonable discretion, the making, issuing, funding or maintaining of such Term Loans through such other office or in accordance with such other measures, as the case may be, would not otherwise adversely affect such Term Loans or the interests of such Lender; provided, such Lender will not be obligated to utilize such other office pursuant to this Section 2.16 unless Company agrees to pay all reasonable incremental expenses incurred by such Lender as a result of utilizing such other office as described above. A certificate as to the amount of any such expenses payable by Company pursuant to this Section 2.16 (setting forth in reasonable detail the basis for requesting such amount) submitted by such Lender to Company (with a copy to Administrative Agent) shall be conclusive absent manifest error.

Section 2.17 Defaulting Lenders. Anything contained herein to the contrary notwithstanding, in the event that any Lender violates any provision of Section 9.5(c), or, other than at the direction or request of any regulatory agency or authority, defaults (in each case, a "Defaulting Lender") in its obligation to fund (a "Funding Default") a Term Loan (in each case, a "Defaulted Loan"), then (a) during any Default Period with respect to such Defaulting Lender, such Defaulting Lender shall be deemed not to be a "Lender" for purposes of voting on any matters (including the granting of any consents or waivers) with respect to

any of the Loan Documents; and (b) to the extent permitted by applicable law, until such time as the Default Excess, if any, with respect to such Defaulting Lender shall have been reduced to zero, (i) any voluntary prepayment of the Term Loans shall, if Administrative Agent so directs at the time of making such voluntary prepayment, be applied to Term Loans of other Lenders as if such Defaulting Lender had no Term Loans outstanding and the outstanding Term Loans of such Defaulting Lender were zero, and (ii) any mandatory prepayment of the Term Loans shall, if Administrative Agent so directs at the time of making such mandatory prepayment, be applied to the Term Loans of other Lenders (but not to the Term Loans of such Defaulting Lender) as if such Defaulting Lender had funded all Defaulted Loans of such Defaulting Lender, it being understood and agreed that Company shall be entitled to retain any portion of any mandatory prepayment of the Term Loans that is not paid to such Defaulting Lender solely as a result of the operation of the provisions of this clause (b). No Term Loan Commitment of any Lender shall be increased or otherwise affected, and, except as otherwise expressly provided in this Section 2.17, performance by Company of its obligations hereunder and the other Loan Documents shall not be excused or otherwise modified as a result of any Funding Default or the operation of this Section 2.17. The rights and remedies against a Defaulting Lender under this Section 2.17 are in addition to other rights and remedies which Company may have against such Defaulting Lender with respect to any Funding Default and which Administrative Agent or any Lender may have against such Defaulting Lender with respect to any Funding Default or violation of Section 9.5(c).

Section 2.18 Removal or Replacement of a Lender. Anything contained herein to the contrary notwithstanding, in the event that: (a) (i) any Lender (an "Increased Cost Lender") shall give notice to Company that such Lender is an Affected Lender or that such Lender is entitled to receive payments under Section 2.14, 2.15 or 2.16, (ii) the circumstances which have caused such Lender to be an Affected Lender or which entitle such Lender to receive such payments shall remain in effect, and (iii) such Lender has declined or is unwilling to designate a different lending office in accordance with Section 2.16; or (b) (i) any Lender shall become a Defaulting Lender, (ii) the Default Period for such Defaulting Lender shall remain in effect, and (iii) such Defaulting Lender shall fail to cure the default as a result of which it has become a Defaulting Lender within five Business Days after Company's request that it cure such default; or (c) in connection with any proposed amendment, modification, termination, waiver or consent with respect to any of the provisions hereof as contemplated by Section 10.5(b), the consent of Administrative Agent and Required Lenders shall have been obtained but the consent of one or more of such other Lenders (each a "Non-Consenting Lender") whose consent is required shall not have been obtained; then, with respect to each such Increased Cost Lender, Defaulting Lender or Non-Consenting Lender (the "Terminated Lender"), Borrower may, by giving written notice to Company and any Terminated Lender of its election to do so, elect to cause such Terminated Lender (and such Terminated Lender hereby irrevocably agrees) to assign its outstanding Term Loans in full to one or more Eligible Assignees (each a "Replacement Lender") in accordance with the provisions of Section 10.6 and Terminated Lender shall pay any fees payable thereunder in connection with such assignment; provided, (1) on the date of such assignment, the Replacement Lender shall pay to Terminated Lender an amount equal to the sum of (A) an amount equal to the principal of, and all accrued interest on, all outstanding Loans of the Terminated Lender and (B) an amount equal to all accrued, but theretofore unpaid fees owing to such Terminated Lender pursuant to Section 2.7; (2) on the date of such assignment, Company shall pay any amounts payable to such Terminated Lender pursuant to Section 2.14 or 2.15; and (3) in the event such Terminated Lender is a Non-Consenting Lender, each Replacement Lender shall consent, at the time of such assignment, to each matter in respect of which such Terminated Lender was a Non-Consenting Lender. Upon the prepayment of all amounts owing to any Terminated Lender, such Terminated Lender shall no longer constitute a "Lender" for purposes hereof; provided, any rights of such Terminated Lender to indemnification hereunder shall survive as to such Terminated Lender. For the avoidance of doubt, all fees that would otherwise be due and payable to any Non-Consenting Lender, including, without limitation, any Yield Maintenance Premium, shall continue to be due and payable to such Non-Consenting Lender.

ARTICLE III

CONDITIONS PRECEDENT

Section 3.1 Closing Date. The effectivness of this Agreement is subject to the satisfaction, or waiver in accordance with Section 10.5, of the following conditions on or before the Closing Date:

(a) Loan Documents. Administrative Agent shall have received copies of each Loan Document duly executed and delivered by each applicable Loan Party for each Lender.

(b) Organizational Documents; Incumbency. Administrative Agent shall have received a Secretary's or Director's Certificate for each Loan Party attaching (i) copies of each Organizational Document of such Loan Party and, to the extent applicable, certified as of a recent date by the appropriate governmental official, each dated the Closing Date or a recent date prior thereto; (ii) signature and incumbency certificates of the officers or directors of such Person executing the Loan Documents to which it is a party; (iii) resolutions of the Board of Directors or similar governing body of such Loan Party approving and authorizing the execution, delivery and performance of this Agreement and the other Loan Documents to which it is a party or by which it or its assets may be bound as of the Closing Date, certified as of the Closing Date by its secretary, assistant secretary or a director as being in full force and effect without modification or amendment; (iv) a good standing certificate from the applicable Governmental Authority of such Loan Party's jurisdiction of incorporation, organization or formation and in each jurisdiction in which it is qualified as a foreign corporation or other entity to do business, each dated a recent date prior to the Closing Date; and (v) such other documents as Administrative Agent may reasonably request.

(c) Organizational and Capital Structure. The organizational structure and capital structure of Borrower and its Subsidiaries shall be as set forth on Schedule 4.2.

(d) Governmental Authorizations and Consents. Each Loan Party shall have obtained all Governmental Authorizations and all consents of other Persons, in each case that are necessary or advisable in connection with the transactions contemplated by the Loan Documents and each of the foregoing shall be in full force and effect and in form and substance reasonably satisfactory to Administrative Agent. All applicable waiting periods shall have expired without any action being taken or threatened by any competent authority which would restrain, prevent or otherwise impose adverse conditions on the transactions contemplated by the Loan Documents or the financing thereof and no action, request for stay, petition for review or rehearing, reconsideration, or appeal with respect to any of the foregoing shall be pending, and the time for any applicable agency to take action to set aside its consent on its own motion shall have expired.

(e) Personal Property Collateral. Administrative Agent shall have received:

(i) subject to Section 5.14, evidence reasonably satisfactory to Administrative Agent of the compliance by each Loan Party of their obligations under the Pledge and Security Agreement and the other Collateral Documents (including, without limitation, their obligations to authorize or execute, as the case may be, and deliver UCC financing statements, originals of Capital Stock (including stock certificates, if any, representing pledged Capital Stock along with appropriate endorsements), instruments and chattel paper, and any agreements governing deposit and/or securities accounts as provided therein), together with (A) appropriate financing statements on Form UCC-1 in form for filing in such office or offices as may be necessary or, in the opinion of Administrative Agent, desirable to perfect the security interests purported to be created by each Pledge and Security Agreement and each other Collateral

Document and (B) evidence satisfactory to Administrative Agent of the submission for filing of such UCC-1 financing statements;

(ii) a completed Perfection Certificate dated the Closing Date and executed by an Authorized Officer of each Loan Party, together with all attachments contemplated thereby, including (A) the results of a recent search, by a Person satisfactory to Administrative Agent, of all effective UCC financing statements (or equivalent filings) made with respect to any assets or property of any Loan Party in the jurisdictions specified in the Perfection Certificate, together with copies of all such filings disclosed by such search, and (B) UCC termination statements (or similar documents) duly executed by all applicable Persons for filing in all applicable jurisdictions as may be necessary to terminate any effective UCC financing statements (or equivalent filings) disclosed in such search (other than any such financing statements in respect of Permitted Liens); and

(iii) evidence that each Loan Party shall have taken or caused to be taken any other action, executed and delivered or caused to be executed and delivered any other agreement, document and instrument and made or caused to be made any other filing and recording reasonably required by Administrative Agent.

(f) Financial Statements; Projections. Lenders shall have received from Borrower (i) the Historical Financial Statements, (ii) pro forma consolidated balance sheets of Borrower and its Subsidiaries, which shall be based on the financial statements of Borrower and its Subsidiaries for the Fiscal Quarter ended March 31, 2024, and adjusted to reflect the transactions contemplated by the Loan Documents to occur on or prior to the Closing Date, which pro forma financial statements shall be in form and substance satisfactory to Administrative Agent, and (iii) the Projections.

(g) Evidence of Insurance. Administrative Agent shall have received a certificate from Company's insurance broker or other evidence satisfactory to it that all insurance required to be maintained pursuant to Section 5.5 is in full force and effect, together with, subject to Section 5.14, endorsements naming Administrative Agent, for the benefit of Secured Parties, as additional insured and loss payee thereunder to the extent required under Section 5.5, in each case, in form and substance reasonably satisfactory to Administrative Agent.

(h) Opinions of Counsel to Loan Parties. Lenders and, with respect to the opinions of counsel for the Loan Parties, their respective counsel shall have received executed copies of the favorable written opinions of Gibson Dunn & Crutcher LLP, counsel for the Loan Parties, as to such other matters as Administrative Agent may reasonably request, dated the Closing Date and otherwise in form and substance reasonably satisfactory to Administrative Agent (and each Loan Party hereby instructs such counsel to deliver such opinions to Administrative Agent and Lenders).

(i) Fees. Company shall have paid to Administrative Agent, the fees and expenses then due and payable pursuant to Section 2.7 and Section 10.2.

(j) Solvency Certificate. On the Closing Date, Administrative Agent shall have received a duly executed Solvency Certificate of the chief financial officer of Borrower, dated as of the Closing Date and addressed to Administrative Agent and Lenders, and in form, scope and substance satisfactory to Administrative Agent, certifying that after giving effect to the consummation of the transactions contemplated herein including the funding of the Initial Term Loan on the Closing Date, Borrower and its Subsidiaries are and will be Solvent.

(k) Closing Date Certificate. Company shall have delivered to Administrative Agent a duly executed Closing Date Certificate, together with all attachments thereto.

(l) No Litigation. There shall not exist any action, suit, investigation, litigation or proceeding or other legal or regulatory developments, pending or threatened in any court or before any arbitrator or Governmental Authority that, in the reasonable discretion of Administrative Agent, singly or in the aggregate, materially impairs the transactions contemplated by the Loan Documents or that would reasonably be expected to have a Material Adverse Effect.

(m) No Material Adverse Effect/Material Regulatory Liability. Since [**], no event, circumstance or change shall have occurred that has caused or evidences, either in any case or in the aggregate, a Material Adverse Effect or a Material Regulatory Liability.

(n) Bank Regulations. Administrative Agent shall have received all documentation and other information reasonably requested that is required by bank regulatory authorities under applicable "know-your-customer" and anti-money laundering rules and regulations, including the Patriot Act and the Beneficial Ownership Regulation, and all such documentation (including the Beneficial Ownership Certification) and other information shall be in form and substance reasonably satisfactory to Administrative Agent.

(o) Representations and Warranties. The representations and warranties contained herein and in each other Loan Document, certificate or other writing delivered to Administrative Agent or any Lender pursuant hereto or thereto on or prior to the date hereof shall be true and correct in all material respects (except that such materiality qualifier shall not be applicable to any representations or warranties that already are qualified or modified as to "materiality" or "Material Adverse Effect" in the text thereof, which representations and warranties shall be true and correct in all respects subject to such qualification) on and as the date hereof to the same extent as though made on and as of that date, except to the extent such representations and warranties specifically relate to an earlier date, in which case such representations and warranties shall have been true and correct in all material respects (except that such materiality qualifier shall not be applicable to any representations or warranties that already are qualified or modified as to "materiality" or "Material Adverse Effect" in the text thereof, which representations and warranties shall be true and correct in all respects subject to such qualification) on and as of such earlier date.

(p) No Default or Event of Default. No event shall have occurred and be continuing or would result from the consummation of the transactions contemplated herein that would constitute an Event of Default or a Default.

(q) No Contravention. The making of the Term Loan shall not contravene any law, rule or regulation applicable to Administrative Agent or any Lender.

(r) Registrations. All Registrations from the FDA, EMA and comparable Governmental Authorities in respect of the Products shall be valid and subsisting and in full force and effect.

(s) Security Interests. The Loan Documents shall create in favor of the Administrative Agent, for the benefit of the Secured Parties, a legal, valid and enforceable first priority security interest in the Collateral secured thereby (subject to Permitted Liens and Section 5.14) located in the United States to the extent permitted by law and subject to the perfection requirements set forth in the Pledge and Security Agreement.

(t) Sources and Uses. On or prior to the Closing Date, Company shall have delivered to Administrative Agent Company's reasonable best estimate of all sources and uses of Cash and other proceeds on the Closing Date.

(u) Funding Notice. Administrative Agent shall have received a fully executed and delivered Funding Notice as and when required by Section 2.1(b)(i).

Each Lender, by delivering its signature page to this Agreement and funding the Initial Term Loan on the Closing Date, shall be deemed to have acknowledged receipt of, and consented to and approved, each Loan Document and each other document or item required to be approved by or satisfactory to Administrative Agent, Required Lenders or Lenders, as applicable, on the Closing Date.

Section 3.2 Conditions to Each Credit Extension. The obligation of each Lender to make any Loan on any date following the Closing Date is subject to the satisfaction, or waiver in accordance with Section 10.5, of the following conditions precedent:

(a) with respect to any Delayed Draw Term Loans, on such Funding Date, at the time of the incurrence of such Delayed Draw Term Loan and also after giving effect thereto, no Event of Default under Sections 8.1(f) and (g) shall have occurred and be continuing; and

(b) with respect to any Incremental Term Loans, the funding of such Term Loan shall have been approved by each Lender in its sole and absolute discretion.

ARTICLE IV

REPRESENTATIONS AND WARRANTIES

In order to induce the Administrative Agent and Lenders to enter into this Agreement and to make each Credit Extension to be made thereby, each Loan Party represents and warrants to the Administrative Agent and Lender, on the Closing Date, that the following statements are true and correct:

Section 4.1 Organization; Requisite Power and Authority; Qualification. Each of Borrower and its Subsidiaries (a) is duly organized or incorporated, validly existing and in good standing under the laws of its jurisdiction of organization or incorporation as identified in Schedule 4.1, (b) has all requisite power and authority to own and operate its properties, to carry on its business as now conducted and as proposed to be conducted, enter into the Loan Documents to which it is a party and to carry out the transactions contemplated thereby and, in the case of Company, to make the borrowings hereunder, and (c) is qualified to do business and in good standing in every jurisdiction where its assets are located and wherever necessary to carry out its business and operations, except in jurisdictions where the failure to be so qualified or in good standing has not had, and would not be reasonably expected to have, a Material Adverse Effect.

Section 4.2 Capital Stock and Ownership. The Capital Stock of each of the Subsidiaries of the Borrower has been duly authorized and validly issued and is fully paid and non-assessable. Except as set forth on Schedule 4.2, as of the date hereof, there is no existing option, warrant, call, right, commitment or other agreement to which any Subsidiaries of the Borrower is a party requiring, and there is no membership interest or other Capital Stock of any Subsidiary of the Borrower outstanding which upon conversion or exchange would require, the issuance by any Subsidiaries of the Borrower of any additional membership interests or other Capital Stock of any Subsidiaries of the Borrower or other securities convertible into, exchangeable for or evidencing the right to subscribe for or purchase, a membership interest or other Capital Stock of any Subsidiaries of the Borrower. Schedule 4.2 correctly sets forth the ownership interest in each Subsidiary of Borrower and in their respective Subsidiaries.

Section 4.3 Due Authorization. The execution, delivery and performance of the Loan Documents and the consummation by each Loan Party of the transactions contemplated hereby and by the

other Loan Documents have been duly authorized by all necessary action on the part of each Loan Party that is a party thereto.

Section 4.4 No Conflict. The execution, delivery and performance by Loan Parties of the Loan Documents to which they are parties and the consummation of the transactions contemplated by the Loan Documents do not and will not (a) violate any provision of (i) any law or any governmental rule or regulation applicable to Borrower or any of its Subsidiaries, (ii) any of the Organizational Documents of Borrower or any of its Subsidiaries, or (iii) any order, judgment or decree of any court or other agency of government binding on Borrower or any of its Subsidiaries; (b) conflict with, result in a breach of or constitute (with due notice or lapse of time or both) a default under any Material Contract; (c) result in or require the creation or imposition of any Lien upon any of the properties or assets of Borrower or any of its Subsidiaries (other than any Liens created under any of the Loan Documents in favor of Administrative Agent, on behalf of Secured Parties); (d) result in any default, non-compliance, suspension revocation, impairment, forfeiture or non-renewal of any permit, license, authorization or approval applicable to its operations or any of its properties; or (e) require any approval of stockholders, members or partners or any approval or consent of any Person under any Material Contract, except for such approvals or consents which will be obtained on or before the Closing Date and disclosed in writing to Lenders.

Section 4.5 Governmental Consents. The execution, delivery and performance by Loan Parties of the Loan Documents to which they are parties and the consummation of the transactions contemplated by the Loan Documents do not and will not require any registration with, consent or approval of, or notice to, or other action to, with or by, any Governmental Authority except for filings and recordings with respect to applicable securities laws or the Collateral to be made, or otherwise delivered to Administrative Agent for filing and/or recordation, as of the Closing Date.

Section 4.6 Binding Obligation. Each Loan Document has been duly executed and delivered by each Loan Party that is a party thereto and is the legally valid and binding obligation of such Loan Party, enforceable against such Loan Party in accordance with its respective terms, except as may be limited by bankruptcy, insolvency, reorganization, moratorium or similar laws relating to or limiting creditors' rights generally or by equitable principles relating to enforceability or in the case of any Loan Document entered into by a Foreign Subsidiary that is a Loan Party, any applicable Foreign Legal Reservations.

Section 4.7 Historical Financial Statements. The Historical Financial Statements were prepared in conformity with GAAP and fairly present, in all material respects, the financial position, on a consolidated basis, of the Persons described in such financial statements as at the respective dates thereof and the results of operations and cash flows, on a consolidated basis, of the entities described therein for each of the periods then ended, subject, in the case of any such unaudited financial statements, to changes resulting from audit and normal year end adjustments and the absence of footnotes. As of the Closing Date, neither Borrower nor any of its Subsidiaries has any contingent liability or liability for taxes, long term lease or unusual forward or long term commitment that is not reflected in the Historical Financial Statements or the notes thereto and which in any such case is material in relation to the business, operations, properties, assets and, condition (financial condition or otherwise) of the Company and prospects of Borrower and any of its Subsidiaries taken as a whole.

Section 4.8 Projections. On and as of the Closing Date, the projections of Borrower and its Subsidiaries for the period of Fiscal Year [**] through and including Fiscal Year [**] including quarterly projections for each Fiscal Quarter during the period of the Fiscal Quarter ended [**] through and including the Fiscal Quarter ending [**], (the "Projections") are based on good faith estimates and assumptions made by the management of Borrower; provided, the Projections are not to be viewed as facts and that actual results during the period or periods covered by the Projections may differ from such Projections and that the differences may be material.

Section 4.9 No Material Adverse Effect. Since [**], no event, circumstance or change has occurred that has caused or evidences, either in any case or in the aggregate, a Material Adverse Effect.

Section 4.10 Adverse Proceedings, Etc. There are no Adverse Proceedings that (a) relate to any Loan Document or the transactions contemplated hereby or thereby or (b) individually or in the aggregate, would materially impair Administrative Agent's security interest in the Collateral, Borrower's and its Subsidiaries' respective rights, powers or remedies with respect to applicable Products or could otherwise reasonably be expected to have a Material Adverse Effect. Neither Borrower nor any of its Subsidiaries is subject to or in default with respect to any final judgments, writs, injunctions, decrees, rules, laws or regulations of any court or any federal, state, municipal or other governmental department, commission, board, bureau, agency or instrumentality, domestic or foreign except to the extent such default could not reasonably be expected to result in a Material Adverse Effect.

Section 4.11 Payment of Taxes. All federal, state and other material Tax returns and reports of Borrower and its Subsidiaries required to be filed by or with respect to any of them have been timely filed, and all federal Taxes and all other material Taxes due and payable upon Borrower and its Subsidiaries and upon or with respect to their respective properties, assets, income, businesses and franchises which are due and payable have been paid when due and payable, except for (a) unpaid Taxes in an aggregate amount at any one time not in excess of $[**] and (b) Taxes that are being contested in good faith by appropriate proceedings diligenctly conducted and for which adequate reserves are being maintained in accordance with GAAP.

Section 4.12 Properties, Title.

(a) Each of Borrower and its Subsidiaries has (i) good, sufficient, marketable and legal title to (in the case of fee interests in real property), (ii) valid leasehold interests in (in the case of leasehold interests in real or personal property), and (iii) good and valid title to (in the case of all other personal property), all of their respective properties and assets reflected in their respective Historical Financial Statements referred to in Section 4.7 and in the most recent financial statements delivered pursuant to Section 5.1, in each case except for (x) assets disposed of since the date of such financial statements in the ordinary course of business or as otherwise permitted under Section 6.9 or (y) defects in title or interests which would not, individually or in the aggregate, reasonably be expected to interfere with the Borrower or its applicable Subsidiary's ability to conduct its business as currently conducted or utilize such property for its intended purpose. All such properties and assets are in working order and condition, ordinary wear and tear excepted, and except as permitted by this Agreement, all such properties and assets are free and clear of Liens (other than Permitted Liens). As of the Closing Date, Schedule 4.12 contains a true, accurate and complete list of all Real Property owned or leased by Borrower and its Subsidiaries or where Collateral or books and records are located.

(b) With respect to the Real Property:

(i) there are no pending threatened condemnation proceedings relating to such Real Property;

(ii) each lease is in full force and effect and there are no defaults;

(iii) there are currently no options or rights of first refusal of any third party to purchase or lease such Real Property, or any portion thereof or interest therein; and

(iv) each Loan Party and each of its Subsidiaries has good record and marketable title in fee simple to, or valid leasehold interests in, all Real Property necessary or used in the Company's business, free and clear of all Liens other than Permitted Liens.

Section 4.13 Environmental Matters. Except as any such failure could not reasonably be expected to result in a Material Adverse Effect:

(a) No Environmental Claim has been asserted against any Loan Party or any predecessor in interest nor has any Loan Party received written notice of any threatened or pending Environmental Claim against Loan Party or any predecessor in interest.

(b) There has been no Release of Hazardous Materials and there are no Hazardous Materials present in violation of Environmental Law at each of the Real Property currently owned or operated by any Loan Party.

(c) The operation of the business of, and each of the Real Property owned or operated by, each Loan Party are in compliance with all Environmental Laws.

(d) Each Loan Party holds and is in compliance Governmental Authorizations required under any Environmental Laws in connection with the operations carried on by it and the Real Property owned or operated by it.

Section 4.14 No Defaults. Neither Borrower nor any of its Subsidiaries is in default in the performance, observance or fulfillment of any of the obligations, covenants or conditions contained in any of its Contractual Obligations, and no condition exists which, with the giving of notice or the lapse of time or both, could constitute such a default, except, in each case, where the consequences, direct or indirect, of such default or defaults, if any, could not reasonably be expected to have a Material Adverse Effect.

Section 4.15 Material Contracts.

(a) Schedule 4.15 contains a true, correct and complete list of all the Material Contracts in effect on the Closing Date, which, together with any updates provided pursuant to Section 5.1(l), all such Material Contracts are in full force and effect and no defaults currently exist thereunder (other than as described in Schedule 4.15 or in such updates).

(b) Except as described in Schedule 4.15, each Material Contract is a legal, valid and binding obligation of Borrower, its Subsidiaries and, to the knowledge of Borrower, each other party thereto, is enforceable in accordance with its terms and is in full force and effect, subject to bankruptcy, insolvency, fraudulent transfer, reorganization, moratorium and similar laws of general applicability relating to or affecting creditors' rights and to general equity principles. Except as disclosed to the Administrative Agent prior to the Closing Date, neither Borrower nor its Subsidiaries, nor to the knowledge of Borrower or its Subsidiaries, any other party to any Material Contract, is or was in material breach or default, under the terms of any Material Contract. No condition exists which, with the giving of notice or the lapse of time or both, would reasonably be expected to constitute a material breach or default by Borrower or any of its Subsidiaries or that could result in any material liability or loss of rights of Borrower or such Subsidiary or termination of such Material Contract.

Section 4.16 Governmental Regulation. Neither Borrower nor any of its Subsidiaries is subject to regulation under the Public Utility Holding Company Act of 2005, the Federal Power Act or the Investment Company Act of 1940 or under any other federal or state statute or regulation which may limit its ability to incur Indebtedness or which may otherwise render all or any portion of the Obligations

unenforceable. Neither Borrower nor any of its Subsidiaries is a "registered investment company" or a company "controlled" by a "registered investment company" or a "principal underwriter" of a "registered investment company" as such terms are defined in the Investment Company Act of 1940.

Section 4.17 Margin Stock. Neither Borrower nor any of its Subsidiaries is engaged principally, or as one of its important activities, in the business of extending credit for the purpose of purchasing or carrying any Margin Stock. No part of the proceeds of the Term Loans made to such Loan Party will be used to purchase or carry any such Margin Stock or to extend credit to others for the purpose of purchasing or carrying any such Margin Stock or for any purpose that violates, or is inconsistent with, the provisions of Regulation T, U or X of the Board of Governors of the Federal Reserve System or any similar regulation in any other jurisdiction.

Section 4.18 Employee Benefit Plans. No ERISA Event has occurred or is reasonably expected to occur that has resulted or could resaonably be expected to result in a Material Adverse Effect.

Section 4.19 Certain Fees. Except as disclosed to Administrative Agent prior to the Closing Date, no broker's or finder's fee or commission will be payable with respect hereto or any of the transactions contemplated hereby.

Section 4.20 Solvency. The Loan Parties and their Subsidiaries on a consolidated basis are, and upon the consummation of the transactions contemplated hereunder and the incurrence of the Credit Extension hereunder on the Closing Date, will be, Solvent.

Section 4.21 ERISA. The underlying assets of Borrower and its Subsidiaries do not constitute "plan assets" (within the meaning of 29 CFR § 2510.3-101 et seq., as modified by Section 3(42) of ERISA) of one or more Benefit Plans and the execution, delivery and performance of this Agreement and the other Loan Documents do not and will not constitute a non-exempt prohibited transaction under Section 406 of ERISA or Section 4975 of the Internal Revenue Code.

Section 4.22 Compliance with Statutes, Etc. Each of Borrower and its Subsidiaries is in compliance with (i) its Organizational Documents and (ii) all applicable laws, statutes, regulations and orders of, and all applicable restrictions imposed by, all Governmental Authorities, in respect of the conduct of its business and the ownership of its property, except such non-compliance that, individually or in the aggregate, could not reasonably be expected to result in a Material Adverse Effect.

Section 4.23 Intellectual Property.

(a) To the knowledge of the Loan Parties, each of Borrower and its Subsidiaries own, or hold licenses in, all Intellectual Property Rights it purports to own or in-license that are necessary to the conduct of its business as currently conducted and currently proposed to be conducted, including the discovery, development, manufacture, use and Commercialization of the Products. Except as set forth in the License Agreements identified or not required to be identified on Schedule 4.23(b), Borrower and its Subsidiaries have the exclusive right and license to research, develop, manufacture, use and Commercialize the Products and use the Platform Technology under the Product Intellectual Property Rights and Platform Intellectual Property Rights, the Registrations, and the Regulatory Documentation, except where the failure to have such exclusive rights and licenses would not reasonably be likely to result in a Material Adverse Effect.

(b) Schedule 4.23(b) sets forth a true, correct and complete listing, under separate headings, of all Contractual Obligations, whether written or oral (i) under which Borrower or its Subsidiaries is granted a license or other material right to use any Product Intellectual Property Rights or

Platform Intellectual Property Rights that any other Person owns or under which Borrower or its Subsidiaries owes any royalties or other payments to any Person, in each case, for the use of any such Intellectual Property Rights in the research, development, use, import or Commercialization of a Product (other than licenses received from contract research organizations (CROs), contract development and manufacturing organizations (CDMOs), contract manufacturing organizations (CMOs) or other service providers in the ordinary course of business), or (ii) under which Borrower or its Subsidiaries have granted any Person any right or interest in any Product Intellectual Property Rights, Platform Intellectual Property Rights, Registrations, and/or Regulatory Documentation (other than licenses given to contract research organizations (CROs), contract development and manufacturing organizations (CDMOs), contract manufacturing organizations (CMOs) or other service providers in the ordinary course of business), including co-existence agreements and covenants not to sue, except in each case of clauses (i) and (ii), Contractual Obligations relating solely to any Pipeline Product, where such Contractual Obligations are not material to the research, development, use, import or Commercialization of such Pipeline Product (collectively, "License Agreements") that are in effect as of the Effective Date. Upon written request by the Administrative Agent (but no more frequently than every Calendar Quarter), Borrower shall update Schedule 4.23(b) to list any new License Agreements entered into after the Effective Date (including, for the avoidance of doubt, any Permitted Zodasiran Agreement and any Permitted Plozasiran Agreement, if any). A true, correct and complete copy of each License Agreement has been provided to the Administrative Agent by the Borrower prior to the Closing Date. Neither the Borrower nor any of its Subsidiaries, on the one hand, nor the respective counterparty(ies) thereto has made or entered into any amendment, supplement or modification to, or granted any waiver under any provision of any License Agreement. Each License Agreement identified on Schedule 4.23(b) is a valid and binding obligation of Borrower and, to the knowledge of such Loan Party, the counterpart(ies) thereto, and, to the knowledge of such Loan Party, is enforceable against each counterparty thereto in accordance with its terms, except as may be limited by applicable Debtor Relief Laws or by general principles of equity (whether considered in a proceeding in equity or at law). Each License Agreement identified on Schedule 4.23(b) will continue to be legal, valid, binding, enforceable (except as such enforceability may be limited by applicable Debtor Relief Laws or by general principles of equity (whether considered in a proceeding in equity or at law)), and in full force and effect on identical terms, immediately following the consummation of the transactions contemplated by this Agreement. Borrower has not received any written notice in connection with any such License Agreement challenging the validity, enforceability or interpretation of any provision of such agreement. Borrower has not (A) given written notice to a counterparty of the termination of any such License Agreement (whether in whole or in part) or any written notice to a counterparty expressing any intention to terminate any such License Agreement or (B) received from a counterparty thereto any written notice of termination of any such License Agreement (whether in whole or in part) or any written notice from a counterparty stating its intention to terminate any such License Agreement. Except as set forth on Schedule 4.23(b), Borrower has not consented to any assignment by the counterparty to any License Agreement of any of its rights or obligations under any such License Agreement, and, to the knowledge of such Loan Party, the counterparty has not assigned any of its rights or obligations under any such License Agreement to any Person. Borrower has not notified in writing the respective counterparty to any License Agreement or any other Person of any claims for indemnification under any License Agreement nor has Borrower received any written claims for indemnification under any License Agreement. Borrower has not received any written notice from, or given any written notice to, any counterparty to any License Agreement alleging any infringement of any of the Patent rights licensed thereunder. To the knowledge of the Loan Parties, there are no sublicenses (excluding subcontracting) that have been granted by a Licensee under any License Agreement. Except as has been disclosed to the Administrative Agent prior to the Closing Date, there is and has been no breach or default under any provision of any License Agreement either by Borrower or, to the knowledge of Borrower, by the respective counterparty (or any predecessor thereof) thereto, and, to the knowledge of Borrower, there is no event that upon notice or the passage of time, or both, would reasonably be expected to give rise to any breach or default either by Borrower or by the respective counterparty to such agreement.

(c) Schedule 4.23(c) sets forth as of July 26, 2024 a true, correct and complete listing, including the owner and registration or application number, of (i) all the Product Intellectual Property Rights related to Zodasiran, Plozasiran and/or the Partnered Assets, and (ii) all Platform Intellectual Property Rights with respect to Material Products, in the case of (i) and (ii), that are U.S. (federal or state) and foreign (A) Patents, and identifies the owner of each such patent/application, (B) registered trademarks and trademark applications, (C) registered copyrights and copyright applications, (D) domain names, and (E) any other form of registered Product Intellectual Property Rights and Platform Intellectual Property Rights. Except as identified in Schedule 4.23(c): (1) the owner listed on Schedule 4.23(c) is the exclusive owner of such registration or application; (2) to the knowledge of such Loan Party, such registrations are valid, subsisting and enforceable; (3) none of such registrations or applications have lapsed or been abandoned, cancelled or expired, except for registrations or applications abandoned in the ordinary course of business; (5) Company has taken all reasonable steps to maintain such registrations or applications, including by timely filing fees and responses, except for registrations or applications abandoned in the ordinary course of business; and (5) to the knowledge of such Loan Party, each individual associated with the filing and prosecution of such registrations or applications, including the named inventors in the case of such Product Patents and Platform Patents, has complied in all material respects with all applicable duties of candor and good faith in dealing with any patent office, including the USPTO, in those jurisdictions where such duties exist. Company may update this list to add additional registrations or applications, so long as such amendment occurs by written notice to Administrative Agent, subject to Borrower's obligations and restrictions under this Agreement.

(d) Neither Borrower nor any of its Subsidiaries has received written notice of any threat of any, opposition, interference, reexamination, inter partes review, post-grant review, derivation or other post-grant proceeding, injunction, claim, suit, action, subpoena, hearing, inquiry, investigation (by the International Trade Commission or otherwise), complaint, arbitration, mediation, demand, decree or other dispute, disagreement, proceeding or claim (collectively, "Disputes") that challenges the validity, enforceability, infringement, ownership, or inventorship of any of the Product Intellectual Property Rights or Platform Intellectual Property Rights identified in Schedule 4.23(c), the Registrations and/or the Regulatory Documentation. Borrower and its Subsidiaries have not received any written notice that there is any, and, to their knowledge, there is no, Person who is or claims to be an inventor under any of the Product Patents or Platform Patents identified in Schedule 4.23(c) who is not a named inventor thereof.

(e) Neither the Borrower nor any of its Subsidiaries is party to any past or pending and neither the Borrower nor its Subsidiaries has, since July 26, 2014, received written notice of any threat of any action, suit, or proceeding, or any investigation or claim by any Person that claims or alleges that the discovery, development, manufacture, use or Commercialization of any Product, once marketed, or the use of any Platform Technology does or could infringe on any Patent or other intellectual property rights of any other Person or constitute misappropriation of any other Person's trade secrets or other intellectual property rights.

(f) Except as disclosed in Schedule 4.23(f), neither Borrower nor its Subsidiaries has entered into any Contractual Obligation (i) creating a Lien (other than a Permitted Lien under clauses (a), (t) and (w) of the definition thereof) on the Product Intellectual Property Rights, Platform Intellectual Property Rights, Registrations, Regulatory Documentation or License Agreements or any of its Royalties on, or proceeds from, sales of any Product, (ii) pursuant to which Borrower or its Subsidiaries has sold, transferred, assigned or pledged to any Person, Royalties on, or proceeds from, sales of any Product or use of any Platform Technology, or (iii) providing for Milestones or similar development-, commercialization- or intellectual property-related payments to any Person applicable (or that with further development and commercialization may become applicable) to any such Product or Platform Technology.

Section 4.24 Insurance. Each of Borrower and its Subsidiaries keeps its property adequately insured and maintains (a) insurance to such extent and against such risks, as is customary with companies in the same or similar businesses, (b) workmen's compensation insurance in the amount required by applicable law, (c) public liability insurance, which shall include product liability insurance, in the amount customary with companies in the same or similar business against claims for personal injury or death on properties owned, occupied or controlled by it, and (d) such other insurance as may be required by law or as may be reasonably required by Administrative Agent (including, without limitation, against larceny, embezzlement or other criminal misappropriation). Schedule 4.24 sets forth a list of all insurance maintained by each Loan Party on the Closing Date.

Section 4.25 Permits, Etc. Each Loan Party has, and is in compliance with, all permits, licenses, authorizations, approvals, entitlements, and accreditations required for such Person lawfully to own, lease, manage or operate, or to acquire, each business currently owned, leased, managed or operated, or to be acquired, by such Person, which, if not obtained, could not reasonably be expected to have a Material Adverse Effect. No condition exists or event has occurred which, in itself or with the giving of notice or lapse of time or both, would result in the suspension, revocation, impairment, forfeiture or non-renewal of any such permit, license, authorization, approval, entitlement or accreditation, and there is no claim that any thereof is not in full force and effect, except, in each case, to the extent any such condition, event or claim could not be reasonably be expected to have a Material Adverse Effect.

Section 4.26 Bank Accounts and Securities Accounts. Schedule 4.27 sets forth a complete and accurate list as of the Closing Date of all deposit, checking and other bank accounts, all securities and other accounts maintained with any broker dealer and all other similar accounts maintained by each Loan Party, together with a description thereof (i.e., the bank or broker dealer at which such deposit or other account is maintained and the account number and the purpose thereof).

Section 4.27 Security Interests. The Collateral Documents create in favor of Administrative Agent, for the benefit of Secured Parties, a legal, valid and enforceable security interest in the Collateral secured thereby. Upon the filing of the UCC-1 financing statements described in Section 3.1(e), the posssession by Administrative Agent of any certificated Capital Stock or instrument owned by such Loan Party, the recording of the Collateral Assignments for Security referred to in each Pledge and Security Agreement in the United States Patent and Trademark Office and the United States Copyright Office, as applicable, such security interests in and Liens on the Collateral granted thereby shall be perfected, first priority security interests, and no further recordings or filings are or will be required in connection with the creation, perfection or enforcement of such security interests and Liens, other than (a) the filing of continuation statements in accordance with applicable law, (b) the recording of the Collateral Assignments for Security pursuant to each Pledge and Security Agreement in the United States Patent and Trademark Office and the United States Copyright Office, as applicable, with respect to after-acquired U.S. patent and trademark applications and registrations and U.S. copyrights and (c) the recordation of appropriate evidence of the security interest in the appropriate foreign registry with respect to all foreign Intellectual Property.

Section 4.28 PATRIOT ACT and FCPA. To the extent applicable, each Loan Party is in compliance with (a) the laws, regulations and Executive Orders administered by OFAC, and (b) the Bank Secrecy Act, as amended by the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (USA PATRIOT Act) of 2001 (the "PATRIOT Act"). Neither the Loan Parties nor any of their officers, directors, employees, agents or shareholders acting on the Loan Parties' behalf shall use the proceeds of the Loans to make any payments, directly or indirectly (including through any third party intermediary), to any Foreign Official in violation of the United States Foreign Corrupt Practices Act of 1977 (the "FCPA"). None of the Loan Parties nor any Affiliates of any Loan Parties, is in violation of any Anti-Terrorism Law or engages in or conspires to engage in any transaction that evades or avoids, or has the purpose of evading or avoiding, or attempts to violate, any of

the Anti-Terrorism Laws. None of the Loan Parties, nor any Affiliates of any Loan Parties, or their respective agents acting or benefiting in any capacity in connection with the Loans or other transactions hereunder, is a Blocked Person. None of the Loan Parties, nor any of their agents acting in any capacity in connection with the Loans or other transactions contemplated hereunder (A) conducts any business or engages in making or receiving any contribution of funds, goods or services to or for the benefit of any Blocked Person, or (B) deals in, or otherwise engages in any transaction relating to, any property or interests in property blocked pursuant to any OFAC Sanctions Programs.

Section 4.29 Disclosure. No representation or warranty of any Loan Party contained in any Loan Document or in any other documents, certificates or written statements made or furnished to Lenders by or on behalf of Borrower or any of its Subsidiaries for use in connection with the transactions contemplated hereby, when taken as a whole, contains any untrue statement of a material fact or omits to state a material fact necessary in order to make the statements contained herein or therein not materially misleading in light of the circumstances in which the same were made. Any projections and pro forma financial information contained in such materials are based upon good faith estimates and assumptions believed by Company to be reasonable at the time made, it being recognized by Lenders that such projections as to future events are not to be viewed as facts and that actual results during the period or periods covered by any such projections may differ materially from the projected results. As of the Closing Date, there are no facts known (or which should upon the reasonable exercise of diligence be known) to Company (other than matters of a general economic nature) that, individually or in the aggregate, could have a material adverse impact on the transactions contemplated hereby or the Material Products that have not been disclosed herein or in such other documents, certificates and statements furnished to Lenders for use in connection with the transactions contemplated hereby. The information provided by the Loan Parties to Lenders in the Perfection Certificate (as supplemented in accordance with Section 5.1(n)) is true and correct in all material respects as of the date such Perfection Certificate was delivered.

Section 4.30 Use of Proceeds. The proceeds of the Term Loans shall be applied by Company to fund working capital, capital expenditures and general corporate purposes of Borrower and its Subsidiaries; provided that, Incremental Term Loans shall be used in a manner as agreed upon between the Company and the Administrative Agent. No portion of the proceeds of the Term Loan shall be used in any manner that causes or might cause such Credit Extension or the application of such proceeds to violate Regulation T, Regulation U or Regulation X of the Board of Governors of the Federal Reserve System or any other regulation thereof or to violate the Exchange Act.

Section 4.31 Regulatory Compliance.

(a) Each of Borrower and its Subsidiaries have all Registrations from the FDA, EMA, comparable foreign counterparts or any other Governmental Authority required to conduct their respective businesses as currently conducted, except where the failure to have all such Registrations would not reasonably be expected to, individually or in the aggregate, result in Material Regulatory Liabilities. Each of such Registrations is valid and subsisting in full force and effect, except where the failure to do so would not reasonably be expected to, individually or in the aggregate, result in Material Regulatory Liabilities. To the knowledge of the Loan Parties, neither FDA, EMA, nor any comparable Governmental Authority is considering limiting, suspending, or revoking such Registrations or changing the scope of the marketing authorization or the labeling of any Products subject to such Registrations. To the knowledge of the Loan Parties, there is no false or materially misleading information or significant omission in any Product application or other notification, submission or report to the FDA, EMA, or any comparable Governmental Authority that was not corrected by subsequent submission, and all such applications, notifications, submissions and reports provided Borrower and its Subsidiaries were true, complete, and correct in all material respects as of the date of submission to FDA, EMA, or any comparable Governmental Authority. Borrower and its Subsidiaries have not failed to fulfill and perform their obligations which are due under

each such Registration, and no event has occurred or condition or state of facts exists which would constitute a breach or default under any such Registration, in each case that would reasonably be expected to cause the revocation, termination or suspension or material limitation of any such Registration, including but not limited to any form of clinical hold order. To the knowledge of the Loan Parties, any third party that develops, researches, manufactures, commercializes, distributes, stores, tests, advertises, promotes, sells or markets Products pursuant to an agreement with Borrower or its Subsidiaries (a "Loan Party Partner") is in compliance with all Registrations from the FDA, EMA, and any comparable Governmental Authority insofar as they pertain to Products, and each such Loan Party Partner is, and since [**] has been, in compliance with applicable Public Health Laws, except, in each case, where the failure to so be in compliance would not reasonably be expected to, individually or in the aggregate, result in Material Regulatory Liabilities.

(b) Each of Borrower and its Subsidiaries is in compliance, and since [**] has been in compliance, with all Public Health Laws, except to the extent that any such non-compliance, individually or in the aggregate, could not reasonably be expected to result in Material Regulatory Liabilities.

(c) To the extent applicable, all products designed, developed, investigated, manufactured, prepared, assembled, packaged, tested, labeled, distributed, sold, marketed or delivered by Borrower or any of its Subsidiaries or, to the knowledge of the Loan Parties, service providers providing services to Borrower or any of its Subsidiaries, that are subject to the jurisdiction of the FDA, EMA, or any comparable Governmental Authority have, since [**], been and are being designed, developed, investigated, manufactured, prepared, assembled, packaged, tested, labeled, distributed, sold, marketed or delivered in compliance with the applicable Public Health Laws, except for such noncompliance that would not reasonably be expected to, individually or in the aggregate, result in Material Regulatory Liabilities. To the knowledge of Borrower and its Subsidiaries, there are no defects in the design or technology embodied in any Material Products that are reasonably expected to prevent the safe and effective performance of any such Material Product for its intended use (other than such limitations specified in the applicable package insert, investigator brochure or informed consent), except for such defects that would not reasonably be expected to, individually or in the aggregate, result in Material Regulatory Liabilities or other Liabilities. None of the Products has been the subject of any tort, products liability or warranty action against Borrower or its Subsidiaries or, to the Borrower's knowledge, any non-legal claim for clinical trial compensation by trial participants

(d) Neither Borrower nor any of its Subsidiaries is currently subject to any material obligation arising pursuant to a Regulatory Action and, to the knowledge of the Loan Parties, no such material obligation or Regulatory Action has been threatened or initiated by a Governmental Authority.

(e) (i) Neither Borrower nor any of its Subsidiaries has since [**] received any written notice or communication from the FDA, EMA, or any other Governmental Authority alleging material noncompliance with any Public Health Law and (ii) to the knowledge of the Loan Parties no Loan Party Partner has since [**] received any written notice or communication from the FDA, EMA, or any other Governmental Authority alleging material noncompliance with any Public Health Law, including without limitation any notice of inspectional observation, notice of adverse finding, notice of violation, warning letters, untitled letters or other notices from any Governmental Authority relating to such Loan Party Partner's work for Borrower or such Subsidiary. There have been no recalls, field notifications, market withdrawals, administrative detentions, warnings, "dear doctor" letters, investigator notices, safety alerts or any other notices of action relating to an actual or potential lack of safety, efficacy, or regulatory compliance of any Products ("Safety Notices") and no clinical hold orders issued by the FDA, EMA, or any other oversight authority with respect to an ongoing or anticipated clinical trial of any Product, and to the knowledge of the Loan Parties, there are no facts or circumstances that are reasonably likely to result in

(x) a Safety Notice or clinical hold order or (y) a termination or suspension of research, testing, distribution, manufacturing or commercialization of any Material Product.

Section 4.32 Government Contracts. Except as set forth on Schedule 4.34 as of the Closing Date hereof, neither Borrower nor any of its Subsidiaries is a party to any contract or agreement with any Governmental Authority and none of Borrower's or such Subsidiary's accounts receivables or other rights to receive payment are subject to the Federal Assignment of Claims Act (31 U.S.C. Section 3727) or any similar state, county or municipal law.

Section 4.33 Healthcare Regulatory Laws.

(a) None of Borrower and its Subsidiaries, nor, to their knowledge, any officer, director, managing employee or agent (as those terms are defined in 42 C.F.R. § 1001.1001) thereof, is a party to, or bound by, any written order, individual integrity agreement, corporate integrity agreement, deferred or non-prosecution agreement or other written agreement with any Governmental Authority concerning their compliance with Federal Health Care Program Laws.

(b) None of Borrower and its Subsidiaries, nor any officer, director, managing employee or agent (as those terms are defined in 42 C.F.R. § 1001.1001) thereof, nor to the knowledge of the Loan Parties, any Loan Party Partner: (i) has been, since [**], charged with or convicted of any criminal offense relating to the delivery of an item or service under any Federal Health Care Program; (ii) has had, since [**], a civil monetary penalty assessed against them under Section 1128A of the Social Security Act; (iii) has been listed on the U.S. General Services Administration published list of parties excluded from federal procurement programs and non-procurement programs; or (iv) to the knowledge of the Loan Parties, is the target or subject of any current or potential suit, claim, action, proceeding, arbitration, mediation, inquiry, subpoena or investigation relating to any of the foregoing or any Federal Health Care Program-related offense, or which could result in the imposition of material penalties or the debarment, suspension or exclusion from participation in any Federal Health Care Program. None of Borrower and its Subsidiaries, nor any officer, director, managing employee or agent (as those terms are defined in 42 C.F.R. § 1001.1001) thereof, nor any Loan Party Partner, has been debarred, excluded, disqualified or suspended from participation in any Federal Health Care Program or under any FDA Laws (including 21 U.S.C. § 335a).

(c) None of Borrower and its Subsidiaries, nor any officer, director, managing employee or agent (as those terms are defined in 42 C.F.R. § 1001.1001) thereof, nor to the knowledge of the Loan Parties, any Loan Party Partner, has, since [**], violated or engaged in any activity that is in violation of any Federal Health Care Program Laws or cause for false claims liability, civil penalties or mandatory or permissive exclusion from any Federal Health Care Program, except where the violation would not reasonably be expected to result, either individually or in the aggregate, in Material Regulatory Liabilities.

(d) To the knowledge of the Loan Parties, no person has filed or has threatened to file against Borrower or any of its Subsidiaries, an action relating to any FDA Law, Public Health Law or Federal Health Care Program Law under any whistleblower statute, including without limitation, the False Claims Act of 1863 (31 U.S.C. § 3729 et seq.).

Section 4.34 Data Protection. Each of Borrower and its Subsidiaries is operating, and since [**] has been operating in material compliance with: (i) applicable Data Protection Laws; (ii) applicable industry standards; (iii) contractual obligations to which Borrower or any Subsidiaries is bound; and (iv) all of Borrower and each of its Subsidiaries' internal privacy policies, in each case relating to privacy, data protection, consumer protection, consent or the collection, retention, protection, and use of Personal Information collected, used or maintained by Borrower or by third parties having access to the records of

Borrower and each of its Subsidiaries that contain any Personal Information, except as would not reasonably be expected to, individually or in the aggregate, result in a Material Adverse Effect. Each of Borrower and its Subsidiaries has adopted and published privacy notices and policies that accurately describe in all material respects the privacy practices of Borrower or any Subsidiary (as applicable), to any website, mobile application or other electronic platform and complied with those notices and policies (collectively, with each of Borrower and each of its Subsidiaries' internal privacy policies, the "Privacy Policies"). The execution, delivery and performance of this Agreement complies and will comply with all Data Protection Laws and Borrower's and each Subsidiary's Privacy Policies in each case in all material respects. Neither Borrower nor any Subsidiary, nor to the knowledge of the Loan Parties, any third party acting on behalf of Borrower or any Subsidiary, has experienced any material incidences in which Personal Information was or may have been stolen or improperly accessed, including any material breach of security or other material loss, unauthorized access, use or disclosure of Personal Information in the possession, custody or control of Borrower or any of its Subsidiaries or any third party acting on behalf of Borrower or any Subsidiary. Neither Borrower nor any Subsidiary, nor, to the knowledge of the Loan Parties, any third party acting on behalf of Borrower or any Subsidiary, has received any: (i) written, or to the knowledge of the Loan Parties, oral inquiry or complaint alleging material noncompliance with Data Protection Laws; (ii) written or, to the knowledge of the Loan Parties, oral claim for material compensation for loss or unauthorized collection, processing or disclosure of Data or other Personal Information; or (iii) written or, to the knowledge of the Loan Parties, oral notification of an application for rectification, erasure or destruction of material Data or other material Personal Information that is still outstanding.

Section 4.35 Customers and Suppliers. There exists no actual or threatened termination, cancellation or limitation of, or modification to or change in, the business relationship between (a) any of Company or its Subsidiaries, on the one hand, and any customer or any group thereof, on the other hand, whose agreements with any of Company or its Subsidiaries are individually or in the aggregate material to the business or operations of such Loan Party or any of its Subsidiaries, or (b) any of Company or its Subsidiaries, on the one hand, and any supplier or any group thereof, on the other hand, whose agreements with any of Company or its Subsidiaries are individually or in the aggregate material to the business or operations of Company or its Subsidiaries, in each case, that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Effect. There exists no present state of facts or circumstances that could give rise to or result in any such termination, cancellation, limitation, modification or change that, individually or in the aggregate, could reasonably be expected to result in a Material Adverse Effect.

ARTICLE V

AFFIRMATIVE COVENANTS

Each Loan Party covenants and agrees that, so long as any Commitment is in effect and until payment in full of all Obligations (other than any such contingent obligations or liabilities hereunder that by express terms thereof survive such payment in full of all Obligations), each Loan Party shall perform, and shall cause each of its Subsidiaries to perform, all covenants in this Article V.

Section 5.1 Financial Statements and Other Reports. Unless otherwise provided below, Borrower will deliver to Administrative Agent and Lenders:

(a) Cash Reports. Promptly, but in any event within [**], after the end of each fiscal month of Borrower where, if at any time during such month, the aggregate market capitalization of the Company (based on the closing price of the Common Stock on the date of such calculation) is less than $[**], a report of the current Cash and Cash Equivalent balances of the Loan Parties, which report shall identify unrestricted and restricted Cash and Cash Equivalents; provided that, if, at any time, the aggregate

market capitalization of the Company (based on the closing price of the Common Stock on the date of such calculation) is less than $[**], Administrative Agent may request at any time, and Borrower shall promptly provide, a report of at least [**]% of the current Cash and Cash Equivalent balances of the Loan Parties, which report shall identify unrestricted and restricted Cash and Cash Equivalents (or, if greater, all Cash and Cash Equivalent balances required to satisfy the covenant set forth in Section 6.8).

(b) Quarterly Financial Statements. Within [**] after the end of each Fiscal Quarter of each Fiscal Year (excluding the fourth Fiscal Quarter), the consolidated balance sheets of Borrower and its Subsidiaries as at the end of such Fiscal Quarter and the related consolidated statements of income, stockholders' equity and cash flows of Borrower and its Subsidiaries for such Fiscal Quarter and for the period from the beginning of the then current Fiscal Year to the end of such Fiscal Quarter, setting forth in each case in comparative form the corresponding figures for the corresponding periods of the previous Fiscal Year, all in reasonable detail, together with a Financial Officer Certification and a Narrative Report with respect thereto; provided that so long as the Borrower is a public filer with the SEC, upon written notice to the Administrative Agent, such [**] period (excluding with respect to the Narrative Report described in clause (b) of the definition thereof) may be extended in accordance with any grace periods provided by the SEC with respect to delivery of such financial statements described in this Section 5.1(b);

(c) Annual Financial Statements. Within [**] after the end of each Fiscal Year, (i) the consolidated balance sheets of Borrower and its Subsidiaries as at the end of such Fiscal Year and the related consolidated statements of income, stockholders' equity and cash flows of Borrower and its Subsidiaries for such Fiscal Year, setting forth in each case in comparative form the corresponding figures for the previous Fiscal Year, in reasonable detail, together with a Financial Officer Certification and Narrative Reports with respect thereto; and (ii) with respect to such consolidated financial statements a report thereon of KPMG LLP or other independent certified public accountants of recognized national standing selected by Borrower or that is otherwise reasonably satisfactory to Administrative Agent (which report shall be unqualified as to going concern and scope of audit, shall not contain any going concern emphasis of matter and shall state that such consolidated financial statements fairly present, in all material respects, the consolidated financial position of Borrower and its Subsidiaries as at the dates indicated and the results of their operations and their cash flows for the periods indicated in conformity with GAAP (other than any such exception, qualification or explanatory paragraph that is with respect to, or resulting from, the upcoming maturity of Indebtedness or any breach or potential breach of Section 6.8); provided that so long as the Borrower is a public filer with the SEC, upon written notice to the Administrative Agent, such [**] period (excluding with respect to the Narrative Report described in clause (b) of the definition thereof) may be extended in accordance with any grace periods provided by the SEC with respect to delivery of such financial statements described in this Section 5.1(c));

(d) Compliance Certificate. Together with each delivery of financial statements of Borrower and its Subsidiaries pursuant to Section 5.1(b) or Section 5.1(c), a duly executed and completed Compliance Certificate, together with evidence attached of the Cash balances contained in each Deposit Account of the Loan Parties;

(e) Royalty Reports; Notice of Disputes. Promptly (but in any event within [**]) after receipt by Borrower or any of its Subsidiaries, a copy of any Royalty Reports, material written communications to or from the counterparty under any License Agreement (other than filings, submissions, reports, notices, correspondence and other documentation related to routine patent prosecution in the ordinary course and any materials that would be deemed privileged in connection with patent litigation) or any written notices regarding the commencement of, or material developments in, any material third party disputes with respect to a Material Product, any Material Contract, any Product Intellectual Property Rights, any Platform Intellectual Property Rights or any Permitted Product Agreement.

(f) Notice of Default. Promptly (but in any event within [**]) upon any executive officer of Borrower obtaining knowledge (i) of any condition or event that constitutes a Default or an Event of Default or that notice has been given to Borrower with respect thereto; (ii) that any Person has given any notice to Borrower or any of its Subsidiaries or taken any other action with respect to any event or condition set forth in Section 8.1(b); or (iii) of the occurrence of any event or change that has caused or evidences or results in, in any case or in the aggregate, a Material Adverse Effect or Material Regulatory Liabilities, a certificate of its Authorized Officers specifying the nature and period of existence of such condition, event or change, or specifying the notice given and action taken by any such Person and the nature of such claimed Event of Default, Default, default, event or condition, and what action Company has taken, is taking and proposes to take with respect thereto;

(g) Notice of Litigation. (A) Promptly (but in any event within [**]) upon any executive officer of Company obtaining knowledge of (i) the institution of, or non-frivolous threat of, any Adverse Proceeding or (ii) any material development in any Adverse Proceeding that, in the case of either clause (i) or (ii) relates to the Products, a material portion of the Collateral or the Material Contracts and would reasonably be expected to result in Material Regulatory Liabilities or Material Adverse Effect, or which seeks to enjoin or otherwise prevent the consummation of, or to recover any damages or obtain relief as a result of, the transactions contemplated hereby, written notice thereof together with such other information as may be reasonably requested by the Administrative Agent and available to Company and (B) concurrently with the delivery of the Compliance Certificate required under Section 5.1(c), a summary report of (i) the institution of, or non-frivolous threat of, any Adverse Proceeding or (ii) any material development in any Adverse Proceeding that, in the case of either clause (i) or (ii), relates to the Material Products, a material portion of the Collateral or the Material Contracts, in each case occurring with respect to the fiscal quarter ended prior to the delivery of such Compliance Certificate;

(h) ERISA. Promptly (but in any event within [**]) upon becoming aware of the occurrence of or forthcoming occurrence of any ERISA Event that would reasonably be expected to result in a material Liability to a Loan Party, a written notice specifying the nature thereof, what action a Loan Party or any ERISA Affiliate has taken, is taking or proposes to take with respect thereto and, when known, any action taken or threatened by the Internal Revenue Service, the Department of Labor or the PBGC with respect thereto;

(i) Insurance Report. As soon as practicable and in any event by the last day of each Fiscal Year, a report in form and substance reasonably satisfactory to Administrative Agent outlining all material insurance coverage maintained as of the date of such report by Borrower and its Subsidiaries and all material insurance coverage planned to be maintained by Borrower and its Subsidiaries in the immediately succeeding Fiscal Year;

(j) Regulatory and Product Notices. Each Loan Party shall promptly (but in any event within [**]) after the receipt or occurrence thereof notify Administrative Agent of:

(i) any written notice received by Borrower or its Subsidiaries alleging potential or actual material violations of any Public Health Law by Borrower or its Subsidiaries, or any written notice from the FTC alleging potential unfair or anticompetitive business practices by Borrower or any of its Subsidiaries,

(ii) any written notice that the FDA (or international equivalent) is limiting, suspending or revoking any Registration (including, but not limited to, by the issuance of a clinical hold order),

(iii) any written notice that Borrower or its Subsidiaries has become subject to any Regulatory Action (other than any routine inspection or investigation in the ordinary course of business),

(iv) the exclusion or debarment from any governmental healthcare program or debarment or disqualification by FDA (or international equivalent) of Borrower or its Subsidiaries or its or their Authorized Officers,

(v) any written notice that a Borrower or any Subsidiary, or any of their Licensees (including Licensees under the Product Agreements or Material Contracts), is being investigated or is the subject of any allegation of potential or actual violations of any Federal Health Care Program Laws,

(vi) any written notice that any Product of Borrower or its Subsidiaries has been seized, withdrawn, recalled, detained, or subject to a suspension of manufacturing, or the commencement of any proceedings in the United States or any other jurisdiction seeking the withdrawal, recall, suspension, import detention, or seizure of any Product are pending or threatened in writing against Borrower or its Subsidiaries,

(vii) any change in the scope of marketing authorization or the labeling of the products of Borrower and its Subsidiaries under any Registrations (which may be satisfied by a press release issued by Borrower),

(viii) any other Regulatory Action threatened or initiated by a Governmental Authority in writing, or

(ix) any written notice by a Governmental Authority that, to the Borrower's knowledge, is considering or implementing such other Regulatory Action,

except, in each case of (i) through (ix) above, where such action would not reasonably be expected to have, either individually or in the aggregate, Material Regulatory Liabilities;

(k) Notice Regarding Material Contracts. Promptly (but in any event within [**]) (A) after a Loan Party or a Subsidiary of a Loan Party receives any notice (written or oral) of default or event of default under any Material Contracts, or (B) after Loan Party or a Subsidiary of a Loan Party receives or otherwise becomes aware of any dispute, litigation, purchase price adjustment (other than in accordance with the terms of such Material Contract), indemnity claim, exercise of rights of set-off or deduction (including any of the foregoing threatened in writing) under or with respect any Material Contract, in each case, reasonably expected to be in excess of $[**], and (ii) promptly (but in any event within [**]), after any new Material Contract (including any New License Agreement) is entered into, in each case of clauses (i) and (ii), furnish to Administrative Agent a written statement describing such event, with copies of such notices or new contracts together with all pertinent detail and information relating thereto in such Loan Party or Subsidiary of Loan Party's possession, custody or control and to the extent allowed to be delivered pursuant to its terms, and an explanation of any actions being taken with respect thereto. Borrower shall promptly provide Administrative Agent with written notice upon becoming aware of a counterparty's material breach of its obligations under any Material Contract;

(l) Information Regarding Collateral. Company will furnish to Administrative Agent prior written notice of any change (a) in any Loan Party's legal name, (b) in any Loan Party's identity or corporate structure, or (c) in any Loan Party's U.S. federal or other taxpayer identification number (if any). Company agrees not to effect or permit any change referred to in the preceding sentence unless all filings have been made under the UCC or otherwise that are required in order for Administrative Agent to continue

at all times following such change to have a valid, legal and perfected security interest in all the Collateral and for the Collateral at all times following such change to have a valid, legal and perfected security interest as contemplated in the Collateral Documents. Company also agrees promptly to notify Administrative Agent if any material portion of the Collateral is damaged or destroyed;

(m) Annual Collateral Verification. Each year, at the time of delivery of annual financial statements with respect to the preceding Fiscal Year pursuant to Section 5.1(c), Company shall deliver to Administrative Agent an Officer's Certificate (a) confirming that there has been no change in such information since the date of the Perfection Certificate delivered on the Closing Date or the date of the most recent certificate delivered pursuant to this Section 5.1(n) or identifying any such change and/or (b) identifying the UCC financing statements (including fixtures filings, as applicable) or other appropriate filings, recordings or registrations that must be made by the Administrative Agent to protect and perfect the security interests under the Collateral Documents during such [**] period;

(n) Products. Promptly, but in any event within [**] after the receipt by Borrower or any of its Subsidiaries or occurrence thereof, as applicable, notify Administrative Agent of:

(i) granting of any licenses or sublicenses under any Permitted Product Agreement received by Borrower;

(ii) amending an existing Permitted Product Agreement, or entering into any new Permitted Product Agreement;

(iii) any material written communications received from the FDA or other Governmental Authority that would reasonably be expected to result in a Material Adverse Effect;

in each case, to the extent related to a Material Product.

(o) Notices re Intellectual Property. Promptly (but in any event within [**]), deliver notice of material infringements of any material Intellectual Property Rights owned or licensed by such Loan Party or any of its Subsidiaries that are known to any Loan Party;

(p) Regulatory Documentation. Except pursuant to the Company's exercise of good faith business judgement to cease or limit the research or development of any such Product other than a Material Product, Company shall, either alone or through its Licensees (to the extent such Licensees have a sole control, responsibility and decision making rights over all regulatory submissions, filings and approvals for their respective Partnered Assets), be responsible for, and shall maintain, with respect to each Product, all submissions and filings for regulatory approval to and regulatory approvals granted by Governmental Authorities relating to such Products. Promptly following Administrative Agent's reasonable request from time to time, Company shall promptly provide to Administrative Agent copies of any and all material regulatory filings submitted to any such Governmental Authorities with respect such Products;

(q) Maintenance, Defense and Enforcement of Patents. Company shall take all commercially reasonable steps to maintain, defend and enforce all Patents within the Product Intellectual Property Rights and Platform Intellectual Property Rights, including by timely filing fees and responses with the United States Patent and Trademark Office or any applicable foreign counterpart (excluding any such Patents for which the Licensee under its applicable Product Agreement has been given sole or a first right to control of such maintenance, defense or enforcement and such Licensee has elected to exercise such right); provided that, for clarity, in no event shall the foregoing preclude Company from abandoning any such Patent so long as such determination is made pursuant to Company's exercise of its reasonable

business judgement, and Company shall provide prompt written notice to Administrative Agent of any material adverse occurrences with respect to any Product Patents or Platform Patents in each case necessary to the development, manufacture or Commercialization of the Material Products, and, upon Administrative Agent's request from time to time, shall promptly provide Administrative Agent with complete and correct copies of (i) any certification received by Company, its Subsidiaries, or any of their respective licensors or licensees pursuant to 21 U.S.C. § 355(j)(2)(A)(vii)(I), (II), (III) or (IV) relating to any Orange Book Patents, and (ii) other than to the extent (and only to the extent) reasonably deemed privileged based on advice of Company counsel, any pleadings, briefs, declarations, correspondence and other documents relating to any Dispute involving any of the Orange Book Patents;

(r) Other Information. (A) Promptly upon their becoming available and in any event within [**] of Borrower's receipt thereof, copies of all amendments, waivers, consents, notices of defaults and reservations of rights with respect to and received by Borrower or its Subsidiaries from any holder of its Indebtedness having a principal amount greater than the Threshold Amount, (B) promptly after submission to any Governmental Authority, all material documents, submissions and information furnished to such Governmental Authority in connection with any investigation of any Loan Party (other than a routine inquiry), and (C) such other information and data with respect to Borrower or any of its Subsidiaries as from time to time may be reasonably requested by Administrative Agent; provided that if such information is of the type otherwise described in the other clauses of this Section 5.1, the relevant limitations applicable in such other sections shall apply; and

(s) Product Revenue. From and after the First Commercial Sale of a Product in any country, for each Fiscal Quarter promptly, but in any event no later than [**] after the end of such, the Borrower shall provide to the Administrative Agent a report (a "Product Revenue Report") setting forth in reasonable detail with respect to each Product, (i) gross sales and Product Revenues for the applicable Fiscal Quarter and Fiscal Year to date, on a country-by-country basis (including all permitted deductions from gross sales used to determine Product Revenues in form and substance substantially similar to what the Company has delivered to the Administrative Agent prior to the Closing Date), (ii) the calculation of the Product Revenues payable to the Administrative Agent for the applicable Fiscal Quarter, identifying, on a Product-by-Product and country-by-country basis, the number of units of each Product sold by Borrower and its Subsidiaries, (iii) the foreign currency exchange rates used (which shall be rates of exchange determined in a manner consistent with the Borrower's method for calculating rates of exchange in the preparation of Borrower's annual financial statements in accordance with GAAP consistently applied) and (iv) a detailed itemization, on a Product by Product basis, of all Royalties, Milestones, Profit Share Amounts, Sublicense Revenue, Joint Venture Proceeds and all corresponding Permitted Reductions, as applicable, for such Fiscal Quarter and a calculation of all amounts owed to the Administrative Agent, on behalf of the Lenders, under this Agreement.

Notwithstanding the foregoing, the obligations in paragraphs (b), (c) and (s)(A) of this Section 5.1 may be satisfied with respect to financial information of Borrower and its Subsidiaries by furnishing Borrower's Form 10-K or 10-Q, as applicable, filed with the SEC; provided that, to the extent such information is in lieu of information required to be provided under Section 5.1(c), any such materials are accompanied by an auditor's report (which report shall be unqualified as to going concern and scope of audit, shall not contain any going concern emphasis of matter and shall state that such consolidated financial statements fairly present, in all material respects, the consolidated financial position of Borrower and its Subsidiaries as at the dates indicated and the results of their operations and their cash flows for the periods indicated in conformity with GAAP (other than any such exception, qualification or explanatory paragraph that is with respect to, or resulting from, the upcoming maturity of Indebtedness or any breach or potential breach of Section 6.8)). Further, notwithstanding anything to the contrary in this Section 5.1, neither Borrower nor any of its Subsidiaries will be required to disclose or permit the inspection or discussion of, any document, information or other matter (i) in respect of which disclosure (or their respective representatives or

contractors) is prohibited by Requirements of Law or any binding agreement or (ii) that is subject to attorney client or similar privilege or constitutes attorney work product, in each case based on the advice of counsel to Borrower.

Section 5.2 Existence. Except as otherwise permitted under Section 6.9, each Loan Party will, and will cause each of Borrower's Subsidiaries to, at all times preserve and keep in full force and effect its existence and all rights and Governmental Authorizations, qualifications, franchises, licenses and permits material to its business and to conduct its business in each jurisdiction in which its business is conducted; provided, no Loan Party or any of Borrower's Subsidiaries shall be required to preserve any such existence, right or Governmental Authorizations, qualifications, franchise, licenses and permits if such Person's Board of Directors (or similar governing body) or any senior officer of such Person shall determine that the preservation thereof is no longer desirable in the conduct of the business of such Person, and that the loss thereof is not disadvantageous in any material respect to such Person or to Lenders.

Section 5.3 Payment of Taxes and Claims. Each Loan Party will, and will cause each of Borrower's Subsidiaries to, file all Tax returns required to be filed by or with respect to Borrower or any of its Subsidiaries and timely pay all Taxes imposed upon or with respect to it or any of its properties, assets, income, businesses or franchises before any penalty or fine accrues thereon, and all claims (including claims for labor, services, materials and supplies) for sums that have become due and payable and that by law have or may become a Lien upon any of its properties or assets, prior to the time when any penalty or fine shall be incurred with respect thereto, except for (a) unpaid Taxes in an aggregate amount at any one time not in excess of $[**] and (b) Taxes that are being contested in good faith by appropriate proceedings diligently conducted and for which adequate reserves are being maintained in accordance with GAAP.

Section 5.4 Maintenance of Properties. Each Loan Party will, and will cause each of Borrower's Subsidiaries to (a) maintain or cause to be maintained in good repair, working order and condition, ordinary wear and tear excepted, all properties used or useful in the business of Borrower and its Subsidiaries and from time to time will make or cause to be made all appropriate repairs, renewals and replacements thereof, except to the extent any such failure to maintain could not reasonably be expected to have a Material Adverse Effect, and (b) comply at all times with the provisions of all material leases to which it is a party as lessee or under which it occupies property, so as to prevent any loss or forfeiture thereof or thereunder, except to the extent any such failure to comply could not reasonably be expected to have a Material Adverse Effect. Each Loan Party shall, and shall cause its Subsidiaries to, (A) maintain adequate administrative, physical, and technical security measures and procedures to protect the confidentiality, integrity, and security of the Loan Parties' data systems and the Loan Parties' data in all material respects, in all cases including from theft, corruption, loss or unauthorized use, access, interruption, deletion, or modification by any Person, and (B) keep all Loan Party data systems operational and maintain adequate backups and disaster recovery arrangements that are at least reasonable and at least consistent with, as protective as, and no less rigorous than, industry standards for companies and businesses of similar size in similar industries. Without limiting the generality of the foregoing, each Loan Party shall, and shall cause its Subsidiaries to, (x) maintain applicable equipment and software in physically secure premises, (y) utilize industry-accepted virus and intrusion checking software and firewalls, and (z) limit access to Loan Party data to only those employees and agents who need such access for the conduct of the business of the Loan Parties and their Subsidiaries, in each case except as would not reasonably result in a Material Adverse Effect.

Section 5.5 Insurance.

(a) The Loan Parties will maintain or cause to be maintained, with financially sound and reputable insurers, (i) business interruption insurance, and (ii) casualty insurance, such public liability insurance, third party property damage insurance or such other insurance with respect to liabilities, losses

or damage in respect of the assets, properties and businesses of the Loan Parties as may customarily be carried or maintained under similar circumstances by Persons of established reputation engaged in similar businesses, in each case in such amounts (giving effect to self-insurance), with such deductibles, covering such risks and otherwise on such terms and conditions as shall be customary for such Persons, in each case as determined by the Borrower in its reasonable business judgment. Each such policy of insurance shall, subject to Section 5.14, (1) name Administrative Agent, on behalf of Lenders as an additional insured thereunder as its interests may appear, and (2) in the case of each casualty insurance policy, contain a loss payable clause or endorsement, satisfactory in form and substance to Administrative Agent, that names Administrative Agent, on behalf of Secured Parties as the loss payee thereunder. If any Loan Party or any of its Subsidiaries fails to maintain such insurance, Administrative Agent may, upon [**] prior written notice to Borrower, arrange for such insurance, but at Company's expense and without any responsibility on Administrative Agent's part for obtaining the insurance, the solvency of the insurance companies, the adequacy of the coverage, or the collection of claims. Upon the occurrence and during the continuance of an Event of Default, Administrative Agent shall have the sole right, in the name of the Lenders, any Loan Party and its Subsidiaries, to file claims under any insurance policies, to receive, receipt and give acquittance for any payments that may be payable thereunder, and to execute any and all endorsements, receipts, releases, assignments, reassignments or other documents that may be necessary to effect the collection, compromise or settlement of any claims under any such insurance policies.

(b) Each of the insurance policies required to be maintained under this Section 5.5 shall, subject to Section 5.14, provide for either (i) at least [**] prior written notice to Administrative Agent of the cancellation or substantial modification thereof or (ii) if not permitted by the applicable insurance provider after the use of commercially reasonable efforts to obtain such prior written notice, prompt notice following any cancelation or substantial modification thereof. Receipt of such notice shall entitle Administrative Agent (but Administrative Agent shall not be obligated), upon [**] prior written notice to Loan Parties, to renew any such policies, cause the coverages and amounts thereof to be maintained at levels required pursuant to this Section 5.5 or otherwise to obtain similar insurance (including with respect to coverage types, limits and premiums) in place of such policies, in each case at the expense of the Loan Parties.

Section 5.6 Books and Records; Inspections. Each Loan Party will, and will cause each of Borrower's Subsidiaries to, (a) maintain at all times at the chief executive office of Borrower copies of all material books and records of Borrower and its Subsidiaries, (b) keep adequate books of record and account in which full, true and correct entries in all material respects are made of all dealings and transactions in relation to its business and activities, and (c) permit any representatives designated by Administrative Agent (including employees of Administrative Agent, any Lender or any consultants, auditors, accountants, lawyers and appraisers retained by Administrative Agent) to visit any of the properties of any Loan Party and any of Borrower's Subsidiaries to inspect, copy and take extracts from its and their financial and accounting records, and to discuss its and their affairs, finances and accounts with its and their officers and independent accountants and auditors, all upon reasonable notice and at such reasonable times during normal business hours (so long as no Default or Event of Default has occurred and is continuing) and as often as may reasonably be requested; provided that, absent the occurrence and continuance of an Event of Default, Administrative Agent and Lenders shall not exercise such rights more often than one time during any Fiscal Year. The Loan Parties agree to pay the reasonable and documented out-of-pocket costs and expenses incurred by the examiner in connection therewith. Upon the Administrative Agent's request, which shall not be more frequently than once per Fiscal Year with respect to any individual License Agreement, the Borrower and its shall use commercially reasonable efforts to exercise any rights they may have under any License Agreement relating to a Product to cause an inspection and/or audit by an independent public accounting firm to be made of the books of account of any counterparty thereto for the purpose of determining the correctness of any payments made under the License Agreement and this Agreement.

Section 5.7 Lenders Meetings.

(a) Borrower will, upon the reasonable request of Administrative Agent or Required Lenders, participate in a conference call of Administrative Agent and Lenders once during each Fiscal Year at such time as may be agreed to by Borrower and Administrative Agent.

Section 5.8 Compliance with Laws.

(a) Each Loan Party will comply, and shall cause each of Borrower's Subsidiaries and all other Persons, if any, on or occupying any Real Property, to comply in all respects, with the requirements of all applicable laws, rules, regulations and orders of any Governmental Authority (including all Environmental Laws), non-compliance with which would reasonably be expected to have, individually or in the aggregate, a Material Adverse Effect.

(b) Without limiting the generality of the foregoing, each Loan Party shall, and shall cause each of Borrower's Subsidiaries to, comply with all FDA Laws and Public Health Laws, and with all applicable Federal Health Care Program Laws, except where the failure to comply would not reasonably be expected to result, either individually or in the aggregate, in Material Regulatory Liabilities. All products developed, manufactured, tested, investigated, distributed or marketed by or on behalf of the Loan Parties and Borrower's Subsidiaries that are subject to the jurisdiction of the FDA or any comparable Governmental Authority have been and shall be developed, tested, manufactured, investigated, distributed, sold and marketed in compliance with the FDA Laws and any other Requirement of Law, including, without limitation, good manufacturing practices, labeling, advertising, record-keeping, and adverse event reporting, except where the failure to comply would not reasonably be expected to result, either individually or in the aggregate, in Material Regulatory Liabilities.

Section 5.9 Environmental.

(a) Each Loan Party shall (i) keep its real property free of any Environmental Liens; (ii) maintain and comply in all material respects with all Governmental Authorizations required under applicable Environmental Laws, except as any such failure could not reasonably be expected to result in a Material Adverse Effect; (iii) take all steps to prevent any Release of Hazardous Materials from any property owned or operated by any Loan Party, except as any such failure could not reasonably be expected to result in a Material Adverse Effect; and (iv) ensure that there are no Hazardous Materials on, at or migrating from any owned Real Property, except as any such failure could not reasonably be expected to result in a Material Adverse Effect.

(b) The Loan Parties shall promptly (but in any event within [**]) notify Administrative Agent in writing (A) of any material Environmental Claims asserted in writing against or material Environmental Liabilities and Costs of any Loan Party, and (B) any notice of Environmental Lien filed against any Real Property, and (ii) provide such other documents and information as reasonably requested by Administrative Agent in relation to any matter pursuant to this Section 5.9(b).

Section 5.10 Subsidiaries. In the event that any Person becomes a Subsidiary of a Loan Party and such Person is not an Excluded Subsidiary, Company shall (a) within [**] of such Person becoming a Subsidiary or ceasing to be an Excluded Subsidiary cause such Subsidiary to become a Guarantor hereunder and a Grantor under the Pledge and Security Agreement and/or applicable non-U.S. security document by executing and delivering to Administrative Agent a Counterpart Agreement and any other applicable required documents, and (b) take all such actions and execute and deliver, or cause to be executed and delivered, all such documents, instruments, agreements, and certificates as are similar to those described in Sections 3.1(b), 3.1(e), and 3.1(h). With respect to each such Subsidiary, Company shall promptly send to

Administrative Agent written notice setting forth with respect to such Person (i) the date on which such Person became a Subsidiary of Company or ceased to be an Excluded Subsidiary, and (ii) all of the data required to be set forth in Schedules 4.1 and 4.2 with respect to all Subsidiaries of Company; provided, such written notice shall be deemed to supplement Schedules 4.1 and 4.2 for all purposes hereof. In addition, at the election of Borrower, any Excluded Subsidiary of Borrower may become a Guarantor hereunder.

Section 5.11 Real Estate Assets. In the event that any Loan Party acquires fee title to a Material Real Property (other than the Wisconsin Facility) during the term of this Loan, Borrower shall send to Administrative Agent a written notice of the occurrence of any such event promptly upon the occurrence of same. Within [**] after the acquisition of any such Material Real Property (or such later time as agreed to by Administrative Agent in its reasonable discretion), such Loan Party shall deliver to Administrative Agent the following (the "Mortgage Deliverables"): (a) a fully executed and notarized Mortgage, in proper form for creating a valid and enforceable lien on the Material Real Property described therein once recorded in the appropriate real estate records and in proper form for recording in such real estate records; (b) an opinion of counsel in the jurisdiction in which such Material Real Property is located with respect to the enforceability of such Mortgage and such other matters as Administrative Agent may reasonably request, in each case in form and substance reasonably satisfactory to Administrative Agent; (c)(i) an ALTA extended mortgagee title insurance policy or an unconditional commitment therefor with respect to such Mortgage (each, a "Title Policy") from a reputable nationally recognized title company reasonably satisfactory to Administrative Agent (the "Title Company"), in an amount not less than the fair market value of such Real Estate Asset, together with a title report issued by the Title Company with respect thereto, dated not more than [**] prior to the date such Material Real Property was acquired and copies of all recorded documents listed as exceptions to title or otherwise referred to therein, which Title Policy shall be effective as of the date of the Mortgage and otherwise be in form and substance reasonably satisfactory to Administrative Agent and (ii) evidence satisfactory to Administrative Agent that such Loan Party has paid to or deposited with the Title Company all expenses and premiums of the Title Company and all other sums required in connection with the issuance of such Title Policy and all recording and stamp taxes (including mortgage recording and intangible taxes) payable in connection with recording the Mortgage for such Material Real Property in the appropriate real estate records; (d) a completed "Life-of-Loan" Federal Emergency Management Agency standard flood hazard determination with respect to each Material Real Property (together with a notice about special flood hazard area status and flood disaster assistance duly executed by the applicable Loan Party relating thereto), and to the extent required by law, evidence of flood insurance with respect to such Material Real Property in compliance with any applicable regulations of the Board of Governors of the Federal Reserve System, and in form and substance reasonably satisfactory to Administrative Agent; and (e) a Survey of such Material Real Property; provided, however, that a Survey shall not be required to the extent that (A) an existing survey together with an "affidavit of no change" satisfactory to the Title Company is delivered to the Administrative Agent and (B) the Title Company removes the standard survey exception and provides customary survey related endorsements and other coverages in the applicable Title Policy. In addition to the foregoing, Borrower shall, at the reasonable request of Required Lenders, deliver to Administrative Agent an appraisal of such Material Real Property to verify the amount of the Mortgage and/or Title Policy, but only if required by applicable law or regulation.

Section 5.12 Further Assurances.

(a) At any time or from time to time upon the request of Administrative Agent, each Loan Party will, at its expense, promptly execute, acknowledge and deliver such further documents and do such other acts and things as Administrative Agent may reasonably request in order to effect fully the purposes of the Loan Documents, including providing Lenders with any information reasonably requested hereunder. In furtherance and not in limitation of the foregoing, each Loan Party shall take such actions as Administrative Agent may reasonably request from time to time to ensure that the Obligations are

guarantied by the Guarantors and are secured by substantially all of the assets of Borrower's Subsidiaries and all of the outstanding Capital Stock of Borrower's Subsidiaries. Notwithstanding anything to the contrary, (a) in no event shall the Borrower or any of its Subsidiaries be required to take any Excluded Perfection Actions and (b) in the event that the Borrower shall at any time desire or be required to join a Foreign Subsidiary as a Guarantor, the Borrower and the Administrative Agent shall reasonably negotiate in good faith to amend this Agreement to subject any guarantee and collateral requirements vis-à-vis any such Foreign Subsidiary, to "agreed security principles" that are customary for the jurisdiction of organization or formation of such Foreign Subsidiary for facilities substantially similar to those provided for in this Credit Agreement (the "Agreed Security Principles"), and all guarantee and collateral requirements hereunder and under the other Loan Documents (subject to the qualifications applying thereto) shall, apply to such Foreign Subsidiary Guarantor and be subject in all cases to such Agreed Security Principles.

(b) Without limiting the provisions of this Article 5 or any other rights or remedies the Administrative Agent may have under this Agreement, if any Outbound License Agreement is terminated in its entirety prior to the Term Loan Maturity Date, then, the applicable Loan Party shall reasonably discuss with the Administrative Agent such Loan Party's development or commercialization plan, as applicable, whether itself or through a new licensee, for the Partnered Asset under such terminated Outbound License Agreement.

(c) If Borrower enters into a new license with a third party, pursuant to which such third party is granted rights to make, have made, use, market, sell, offer for sale, import and otherwise exploit a Partnered Asset for any purpose that the original Licensee would have been permitted to make, have made, use, market, sell, offer for sale, import and otherwise exploit such Partnered Asset under the corresponding terminated Outbound License Agreement (a "New License Agreement"), then thereafter, (i) the New License Agreement shall be included for all purposes in the definitions of "Outbound License Agreement" and "Material Contract" (and the licensees thereunder shall be included for all purposes in the definition of "Licensee") under this Agreement, (ii) such Partnered Asset (solely to the extent licensed under such New License Agreement) shall be subject to the mandatory prepayments set forth in Section 2.10(e), provided that any upfront payment under such New License Agreement shall be deemed a "Milestone" for purposes of such prepayment, and (iii) any payments that are equivalent to the Royalties, Milestones, up-front payments, Profit Share Amounts and Joint Venture Proceeds due under such New License Agreement and any rights similar shall be included for all purposes under this Agreement, and the Borrower's rights and obligations under this Agreement in respect of such Outbound License Agreement shall apply in respect of its rights and obligations under the New License Agreement mutatis mutandis, in each case without any further action by the parties hereto to amend this Agreement. In the event that no New License Agreement is entered into, the Partnered Asset that was the subject of the corresponding terminated Outbound License Agreement shall be subject to the mandatory prepayment provisions of Section 2.10(i).

Section 5.13 Control Agreements. Subject to Section 5.14, each of Borrower and each Guarantor Subsidiary shall hold all of its cash and Cash Equivalents in a Deposit Account or Security Account (i) in the case of any Deposit Account or Security Account maintained in the United States that is not an Excluded Account, subject to a Control Agreement and (ii) in the case of any Deposit Account or Security Account maintained outside of the United States that is not an Excluded Account, subject to a perfected first priority Lien under the laws of the applicable jurisdiction and subject to the Agreed Securities Principles, in each case, within [**] (or such later date reasonably acceptable to the Administrative Agent) after the later of (x) the Closing Date and (y) the opening of such Deposit Accounts or Securities Accounts. All such Control Agreements governed under the laws of a state or territory of the United States shall provide for "springing" cash dominion with respect to each such Deposit Account.

Section 5.14 Post-Closing Matters. Company shall, and shall cause each of the Loan Parties to, satisfy the requirements set forth on Schedule 5.14 on or before the date specified for such requirement or such later date to be determined by Administrative Agent in its reasonable discretion.

Section 5.15 Commercially Reasonably Efforts. Each Loan Party shall, either itself or through its Licensee(s), use Commerically Reasonable Efforts to develop and Commericalize each Material Product during the term of this Agreement.

ARTICLE VI

NEGATIVE COVENANTS

Each Loan Party covenants and agrees that, so long as any Commitment is in effect and until payment in full of all Obligations (other than any such contingent obligations or liabilities hereunder that by the express terms thereof survive such payment in full of all Obligations), such Loan Party shall perform, and shall cause each of its Subsidiaries to perform, all covenants in this Article VI.

Section 6.1 Indebtedness. No Loan Party shall, nor shall it permit any of Borrower's Subsidiaries to, directly or indirectly, create, incur, assume or guaranty, or otherwise become or remain directly or indirectly liable with respect to any Indebtedness, except Permitted Indebtedness.

Section 6.2 Liens. No Loan Party shall, nor shall it permit any of its Subsidiaries to, directly or indirectly, create, incur, assume or permit to exist any Lien on or with respect to any property or asset of any kind (including any document or instrument in respect of goods or accounts receivable) of Borrower or any of its Subsidiaries, whether now owned or hereafter acquired, or any income or profits therefrom, or file or permit the filing of, or permit to remain in effect, any financing statement or other similar notice of any Lien with respect to any such property, asset, income or profits under the UCC of any State or under any similar recording or notice statute, except, in each case of the foregoing, for Permitted Liens.

Section 6.3 Material Contracts. Except as otherwise consented to by the Administrative Agent, none of Borrower or any of its Subsidiaries shall agree to any set-off, counterclaim or other deduction under or with respect to any Material Contract, other than any such set-off, counter claim or other deduction that is explicitly required by the terms of such Material Contract as in effect on the Closing Date or, with respect to any Material Contract entered into after the Closing Date, on the date such Material Contract became effective. Borrower and its Subsidiaries shall not materially breach any Material Contract, or otherwise default under any Material Contract, in such a manner as could reasonably be expected to give rise to a termination right of any other party to such Material Contract or loss of rights of any Loan Party thereunder. Borrower and its Subsidiaries shall not amend or permit the amendment of any provision of any Material Contract the result of which would be economically adverse in any material respect, taken as a whole, to Borrower.

Section 6.4 No Further Negative Pledges. Except with respect to (a) specific property encumbered to secure payment of particular Indebtedness or to be sold pursuant to an executed agreement with respect to an Asset Sale permitted under Section 6.9, (b) restrictions by reason of customary provisions restricting assignments, Liens, subletting or other transfers contained in leases, licenses and similar agreements entered into in the ordinary course of business (provided that such restrictions are limited to the property or assets secured by such Liens or the property or assets subject to such leases, licenses or similar agreements, as the case may be), (c) restrictions under any agreement or other instrument of a Person acquired by or merged, amalgamated or consolidated with or into Loan Party that was in existence at the time of such acquisition (or at the time it merges with or into any Loan Party in connection with the acquisition of assets from such Person (but, in each case, not created in contemplation thereof)), which

encumbrance or restriction is not applicable to any Person, or the properties or assets of any Person, other than the Person, or the property or assets of the Person, so acquired or designation, (d) restrictions on cash or other deposits or net worth imposed by customers under commercial contracts entered into in the ordinary course of business, (e) [reserved], (f) customary provisions in joint venture agreements or arrangements and other similar agreements or arrangements relating solely to the applicable joint venture, (g) any encumbrance or restriction contained in Indebtedness otherwise permitted to be incurred hereunder and (h) any encumbrances or restrictions of the type referred to in the immediately preceding clauses (a) through (g) above imposed by any amendments, modifications, restatements, renewals, increases, supplements, refundings, replacements or refinancings of the contracts, instruments or obligations referred to such immediately preceding clauses (a) through (h) above; provided that such encumbrances and restrictions contained in any such amendment, modification, restatement, renewal, increase, supplement, refunding, replacement or refinancing are, in the good faith judgment of the Borrower, not materially more restrictive, taken as a whole, than the encumbrances and restrictions prior to such amendment, modification, restatement, renewal, increase, supplement, refunding, replacement or refinancing, no Loan Party nor any of Borrower's Subsidiaries shall enter into any agreement prohibiting the creation or assumption of any Lien upon any of its properties or assets, whether now owned or hereafter acquired.

Section 6.5 Restricted Junior Payments. No Loan Party shall, nor shall it permit any of its Subsidiaries through any manner or means or through any other Person to, directly or indirectly, declare, order, pay, make or set apart, or agree to declare, order, pay, make or set apart, any sum for any Restricted Junior Payment, in each case, except for:

(a) the payment of dividends to Company's equityholders in the form of Common Stock;

(b) (i) the issuance of Capital Stock of Company upon the exercise of any warrants, options or rights to acquire such Capital Stock, including upon conversion of any Indebtedness that is convertible into or exchangeable for Capital Stock of Company, and (ii) cash payments in lieu of issuing fractional shares in connection with the exercise of warrants, options or other securities convertible or exchangeable into Capital Stock of Company;

(c) the payment of dividends or other Restricted Junior Payments by a Subsidiary of Borrower to any Loan Party or such Subsidiary's direct parent company;

(d) the repurchase, retirement or other acquisition or retirement for value of Company's Capital Stock held by any future, present or former employee, director, manager, officer or consultant (or any Affiliates, spouses, former spouses, other immediate family members, successors, executors, administrators, heirs, legatees or distributees of any of the foregoing) of Company or any of its Subsidiaries pursuant to any employee, management, director or manager equity plan, employee, management, director or manager stock option plan or any other employee, management, director or manager benefit plan or any agreement (including any stock subscription or shareholder agreement) with any employee, director, manager, officer or consultant of Borrower or any Subsidiary; provided that the aggregate amounts of all such payments made pursuant to this clause (d), shall not, in the aggregate, exceed $[**];

(e) any payments pursuant to any Permitted Royalty Transaction;

(f) (i) the purchase by Borrower of Common Stock (including pursuant to Permitted Equity Derivatives) contemporaneously and otherwise in connection with the incurrence of Permitted Convertible Indebtedness; provided that the aggregate consideration for such Common Stock in connection with such purchases shall not exceed [**]% of the net proceeds received by Borrower from the incurrence

of such Permitted Convertible Indebtedness, and (ii) any non-cash settlement or unwind of a Permitted Equity Derivative;

(g) so long as no Event of Default has occurred and is continuing or would result therefrom, other payments in an aggregate amount not to exceed $[**]; or

(h) any payment on subordinated Indebtedness in accordance with the subordination agreement governing such Indebtedness.

(i) Payment of Indebtedness secured by a Permitted Lien if the asset securing such Indebtedness has been sold or otherwise disposed of in accordance with Section 6.9,

(j) converting (or exchanging) any Indebtedness to (or for) Qualified Capital Stock of Borrower,

(k) the issuance of Capital Stock (and cash in lieu of fractional shares in connection with such issuance) of the Borrower in connection with any conversion, exercise, repurchase, exchange, redemption, settlement or early termination or cancellation of Permitted Convertible Indebtedness

(l) the issuance of Permitted Convertible Indebtedness or subordinated debt that constitutes Permitted Refinancing Indebtedness in exchange for other Permitted Convertible Indebtedness, (g) the redemption, purchase, exchange, early termination or cancellation of Permitted Convertible Indebtedness in an aggregate principal amount not to exceed the Net Proceeds received by the Borrower from the substantially concurrent issuance of additional Permitted Convertible Indebtedness, subordinated debt or Capital Stock in connection with a refinancing of the Permitted Convertible Indebtedness being redeemed, purchased, exchanged, terminated or cancelled; provided that additional Permitted Convertible Indebtedness constitutes Permitted Refinancing Indebtedness.

Section 6.6 Restrictions on Subsidiary Distributions. Except as provided herein, no Loan Party shall, nor shall it permit any of Borrower's Subsidiaries to, create or otherwise cause or suffer to exist or become effective any consensual encumbrance or restriction of any kind on the ability of any Subsidiary of Company to (a) pay dividends or make any other distributions on any of such Subsidiary's Capital Stock owned by Company or any other Subsidiary of Company, (b) repay or prepay any Indebtedness owed by such Subsidiary to Company or any other Subsidiary of Company, (c) make loans or advances to Company or any other Subsidiary of Company, or (d) transfer any of its property or assets to Company or any other Subsidiary of Company other than restrictions (i) in agreements evidencing purchase money Indebtedness permitted by clause (h) of the definition of Permitted Indebtedness that impose restrictions on the property so acquired, (ii) by reason of customary provisions restricting assignments, change of control, subletting or other transfers contained in leases, licenses, joint venture agreements and other agreements entered into in the ordinary course of business or as expressly permitted by this Agreement, and (iii) that are or were created by virtue of any transfer of, agreement to transfer or option or right with respect to any property, assets or Capital Stock not otherwise prohibited under this Agreement. No Loan Party shall, nor shall it permit its Subsidiaries to, enter into any Contractual Obligations which would prohibit a Subsidiary of Borrower from being a Loan Party (other than Subsidiaries that are Excluded Subsidiaries, other than by virtue of clause (e) or (f) of the definition thereof).

Section 6.7 Investments. Borrower shall not, nor shall it permit any of its Subsidiaries to, directly or indirectly, make or own any Investment in any Person, including without limitation any Joint Venture, except Permitted Investments. Notwithstanding the foregoing, in no event shall any Loan Party make any Investment which results in the making of any Restricted Junior Payment not otherwise permitted under the terms of Section 6.5.

Section 6.8 Minimum Qualified Cash. The Loan Parties shall not permit Qualified Cash at any time after the Closing Date to be less than the sum of (a) the Required Milestone Cash Amount and (b) any outstanding Zodasiran Upfront Payment Balance.

Section 6.9 Fundamental Changes; Disposition of Assets. No Loan Party shall, nor shall it permit any of its Subsidiaries to:

(a) enter into any transaction of merger or consolidation, or liquidate, wind up or dissolve itself (or suffer any liquidation or dissolution), including by means of a "plan of division" under the Delaware Limited Liability Company Act or any comparable transaction under any similar law, except:

(i) (x) any Subsidiary of Borrower that is a Loan Party may be merged with or into Company or any Guarantor Subsidiary, or be liquidated, wound up or dissolved, or all or any part of its business, property or assets may be conveyed, sold, leased, transferred or otherwise disposed of, in one transaction or a series of transactions, to Company or any Guarantor Subsidiary; and (y) any Subsidiary of Borrower that is not a Loan Party may be merged with or into Borrower or any other Subsidiary, or be liquidated, wound up or dissolved, or all or any part of its business, property or assets may be conveyed, sold, leased, transferred or otherwise disposed of, in one transaction or a series of transactions, to Company or any other Subsidiary; provided, that in each case of clauses (x) and (y), in the case of such merger involving Borrower, Borrower shall be the continuing or surviving Person and in the case of such merger not involving Borrower but involving a Guarantor Subsidiary, the Guarantor Subsidiary shall be the continuing or surviving person; or

(ii) in connection with Permitted Acquisitions and other Permitted Investments; or

(b) consummate any Asset Sale, in each case, in one transaction or a series of transactions, all or any part of its business, assets or property of any kind whatsoever (including, without limitation, any Product (including, without limitation, any Intellectual Property Rights related thereto), any Product Agreement (including, without limitation, any of Company's rights thereunder), and any Registration), whether real, personal or mixed and whether tangible or intangible, whether now owned or hereafter acquired, except the following, provided, that, (A) in the case of clauses (x) (other than Asset Sales to the Borrower or any of its Subsidiaries), (xi), (xiv), (xv) (xvii), (xviii), (xix), (xx) (other than in the case of agreements or transactions between Loan Parties) and (xxii) which shall be on arms' length and market terms and for fair market value and (B) any agreements or transactions existing on the Closing Date shall be deemed to be on arms' length and market terms and for fair market value:

(i) [reserved]:

(ii) [reserved];

(iii) [reserved];

(iv) [reserved];

(v) the disposition, unwinding or other termination of any Hedging Agreement or any Permitted Equity Derivative or the entry into any Permitted Equity Derivatives;

(vi) (A) Asset Sales of inventory and immaterial assets in the ordinary course of business and (B) the abandonment, disclaimer, forfeiture, dedication to the public, cancellation, non-renewal of Intellectual Property Rights in the ordinary course of business that is not material to any Material

Product or Platform Technology and is no longer useful in any material respect in the business of the Borrower and its Subsidiaries;

(vii) Asset Sales of obsolete or worn out, retired or surplus property, whether now owned or hereafter acquired, in the ordinary course of business;

(viii) surrender or waiver of contractual rights and settlement or waiver of contractual or litigation claims in the ordinary course of business;

(ix) Asset Sales to any Loan Party;

(x) Asset Sales by any Subsidiary that is not a Loan Party; provided that, in connection with such Asset Sales the Company shall receive consideration of which not less than [**]% shall be in cash or Cash Equivalents;

(xi) Asset Sales of Plozasiran pursuant to a Permitted Royalty Transaction under clause (b) of the definition thereof, which shall be subject to the prepayment provisions of Section 2.10(g);

(xii) Asset Sales consisting of Permitted Liens and permitted Restricted Junior Payments;

(xiii) use or transfer of Cash or Cash Equivalents, including the sale or disposition of Cash Equivalents for cash or other Cash Equivalents;

(xiv) Asset Sales of Capital Stock in any Joint Venture to the other holders of Capital Stock in such Joint Venture; provided that in connection with such Asset Sales the Company shall receive consideration of which not less than [**]% shall be in cash or Cash Equivalents;

(xv) other Asset Sales in an amount not to exceed $[**]; provided that in connection with such Asset Sales the Company shall receive consideration of which not less than [**]% shall be in cash or Cash Equivalents;

(xvi) Asset Sales described in clause (c) of the definition thereof so long as any cash proceeds are subject to the requirements of Section 2.10(d);

(xvii) Asset Sales of Pipeline Assets pursuant to one or more Pipeline Asset Monetizations (but excluding, for the avoidance of doubt, any Asset Sales in connection with any tangible (other than inventory) or intangible assets specific to (x) any Material Product, (y) any Specified Transaction, subject to the mandatory prepayments required by Section 2.10(h), and (z) any out-license of Platform Intellectual Property Rights other than pursuant to a Permitted Product Agreement solely for use in of such Platform Intellectual Property Rights in the development, manufacture and /or Commercialization of a Product or back-ups or follow-ons of such Product); provided that, in connection with such Asset Sales the Company shall receive consideration of which not less than [**]% shall be in cash or Cash Equivalents;

(xviii) Asset Sales with respect to Pipeline Assets in connection with any Specified Transaction pursuant to a Permitted Product Agreement; provided that such Specified Transaction is consummated on terms no less favorable than those last disclosed in writing to the Administrative Agent prior to the consummation of such Asset Sale; provided, that, after the consummation of any such Specified Transaction, the assets subject to such Specified Transaction shall become Partnered Assets and shall be

subject to the prepayments required by Section 2.10(e) (excluding any upfront fee received in connection with such Specified Transaction); and provided further that if any Specified Transaction is not consummated within the timeframe required in the definition of "Specified Transaction", the Pipeline Assets that were the subject thereof shall continue to be subject to the mandatory prepayments required by Section 2.10(i);

(xix) transactions pursuant to any Permitted Zodasiran Agreement; provided that, (A) if such transaction is with respect to any Non-Core Market, such transaction (x) shall be permitted without the consent of the Administrative Agent and (y) shall not be subject to any prepayments pursuant to Section 2.10(f) and (B) if such transaction is with respect to any Core Market, such transaction shall be permitted (1) (x) subject to the consent of the Administrative Agent (such consent not to be unreasonably withheld, conditioned or delayed) or (y) without the consent of the Administrative Agent if such transaction is with a Qualified Entity, (2) so long as the Company receives an upfront payment in cash from such Person (including any Qualified Entity) in an amount equal to or greater than $[**] (or the dollar equivalent) (such payment, the "Zodasiran Upfront Payment"), and (3) subject to the required prepayments set forth in Section 2.10(f); provided further that, for the avoidance of doubt, in the event the Borrower does not enter into a Permitted Zodasiran Agreement within the time period set forth in the definition of "Permitted Zodasiran Agreement", Zodasiran shall continue to be a Material Product subject to the prepayment obligations of Section 2.10(f), and Borrower shall not be permitted to enter into any Asset Sale with respect to Zodasiran without the prior written consent of the Administrative Agent.;

(xx) the non-exclusive licensing or non-exclusive sublicensing of any Intellectual Property Rights and intercompany licenses or grants of rights of distribution, co-promotion or similar commercial rights, in each case, in the ordinary course of business and consistent with industry practice and, in each case, which does not materially interfere with the ordinary conduct of the business of Borrower or any of its Subsidiaries;

(xxi) [reserved];

(xxii) the lease, assignment or sublease of any real or personal property (other than any Product, Intellectual Property Rights or dispositions described in clause (e) of the definition of Asset Sale) in the ordinary course of business which do not materially interfere with the ordinary conduct of the business of Borrower or any of its Subsidiaries; and

(xxiii) involuntary loss, damage or description of property or any involuntary condemnation, seizure or taking, by exercise of the power of eminent domain or otherwise, or confiscation or requisition of use of property.

Section 6.10 Disposal of Subsidiary Interests. Except for any sale of its interests in the Capital Stock of any of its Subsidiaries in compliance with the provisions of Section 6.9 or with respect to Permitted Liens, no Loan Party shall, nor shall it permit any of Borrower's Subsidiaries to, in each case solely with respect to the interests of or in Loan Party, (a) directly or indirectly sell, assign, pledge or otherwise encumber or dispose of any Capital Stock of any of its Subsidiaries, except to qualify directors if required by applicable law; or (b) permit any of its Subsidiaries directly or indirectly to sell, assign, pledge or otherwise encumber or dispose of any Capital Stock of any of its Subsidiaries, except to another Loan Party (subject to the restrictions on such disposition otherwise imposed hereunder), or to qualify directors if required by applicable law.

Section 6.11 Sales and Lease Backs. No Loan Party shall, nor shall it permit any of Borrower's Subsidiaries to, directly or indirectly, become or remain liable as lessee or as a guarantor or other surety with respect to any lease of any property (whether real, personal or mixed), whether now owned or hereafter

acquired, which such Loan Party (a) has sold or transferred or is to sell or to transfer to any other Person (other than Borrower or any of its Subsidiaries) or (b) intends to use for substantially the same purpose as any other property which has been or is to be sold or transferred by such Loan Party to any Person (other than Borrower or any of its Subsidiaries) in connection with such lease.

Section 6.12 Transactions with Shareholders and Affiliates. No Loan Party shall, nor shall it permit any of Borrower's Subsidiaries to, directly or indirectly, enter into or permit to exist any transaction (including the purchase, sale, lease or exchange of any property or the rendering of any service) with any direct or indirect holder of [**]% or more of any class of Capital Stock of Borrower or any of its Subsidiaries or, or series of related transactions, with any Affiliate of Borrower or of any such holder with a value in excess of $[**]; provided, that the Loan Parties and Borrower's Subsidiaries may enter into or permit to exist any such transaction if Administrative Agent has consented thereto in writing prior to the consummation thereof; provided, further, that the foregoing restrictions shall not apply to any of the following:

(a) any transaction among the Borrower and its Subsidiaries that are not expressly prohibited hereunder;

(b) reasonable and customary fees paid to current or former members of the Board of Directors (or similar governing body) of Borrower and its Subsidiaries;

(c) compensation arrangements for current and former officers, directors, employees and consultants of Borrower and its Subsidiaries entered into in the ordinary course of business;

(d) transactions (or series of related transactions) that have a value not in excess of $[**] in the aggregate during the term of this Agreement and that are, in the case of each such transaction (or series of related transactions), on terms that are not less favorable to the Borrower or a Subsidiary in any material respect than would be obtainable by the Borrower or such Subsidiary at such time in a comparable arm's-length transaction with a Person other than an Affiliate (as determined in good faith by the senior management or the board of directors of the Borrower); provided that, to the extent such transaction pursuant to this clause (d) has a value equal to or in excess of $[**], such transaction must be approved by the independent board of directors of the Borrower;

(e) any such transaction if Administrative Agent has consented thereto in writing prior to the consummation in its reasonable discretion; and

(f) transactions pursuant to the Visirna JV Documents; provided that, they do not adversely affect (except in an immaterial amount) the Royalties required to be paid to the Borrower under the Visirna License Agreement as of the Closing Date; and

(g) transactions described in Schedule 6.12 (including without limitation, any intercompany licenses or other arrangements existing on the Closing Date).

Section 6.13 Conduct of Business. From and after the Closing Date, no Loan Party shall, nor shall it permit any of its Subsidiaries to, engage in any material line of business other than the businesses engaged in by such Loan Party or its Subsidiaries on the Closing Date or any business reasonably related, complementary, incidental, ancillary thereto or any reasonable extensions thereto.

Section 6.14 Changes to Certain Agreements and Organizational Documents. No Loan Party shall (i) amend or permit any amendments to any Loan Party's Organizational Documents in a manner that is materially adverse to the Lenders in their capacities as such, including, without limitation, any

amendment, modification or change to any of Loan Party's Organizational Documents to effect a division or plan of division pursuant to Section 18-217 of the Delaware Limited Liability Company Act (or any similar statute or provision under applicable law); (ii) amend or otherwise modify any provision of any Permitted Convertible Indebtedness if such amendment or change would be materially adverse to Administrative Agent or the Lenders; or (iii) amend or permit any amendments to, or terminate or waive any provision of, any Material Contract, if such amendment, termination, or waiver would be materially adverse to Administrative Agent or the Lenders.

Section 6.15 Accounting Methods. The Loan Parties will not and will not permit any of their Subsidiaries to modify or change its fiscal year or its method of accounting (other than as may be required to conform to GAAP).

Section 6.16 Deposit Accounts and Securities Accounts. Subject to Section 5.14 and except for Excluded Accounts, no Loan Party shall establish or maintain a Deposit Account or a Securities Account that is not subject to a Control Agreement (or, with respect to any Deposit Accounts or Securities Accounts not maintained in the United States, a perfected first priority Lien under the laws of the applicable jurisdiction and subject to the Agreed Securities Principles) subject to non-consensual Permitted Liens described in clauses (u) and (v) of the definition thereof.

Section 6.17 Anti-Terrorism Laws. None of the Loan Parties, nor any of their Affiliates or agents shall:

(a) conduct any business or engage in any transaction or dealing with any Blocked Person, including the making or receiving any contribution of funds, goods or services to or for the benefit of any Blocked Person,

(b) deal in, or otherwise engage in any transaction relating to, any property or interests in property blocked pursuant to the OFAC Sanctions Programs or

(c) engage in or conspire to engage in any transaction that evades or avoids, or has the purpose of evading or avoiding, or attempts to violate, any of the prohibitions set forth in the OFAC Sanctions Programs, the USA PATRIOT Act or any other Anti-Terrorism Law.

Borrower shall deliver to the Lenders any certification or other evidence requested from time to time by any Lender in its reasonable discretion, confirming Borrower's compliance with this Section 6.18.

Section 6.18 Anti-Corruption Laws. No Loan Party shall use, or permit any of its Subsidiaries to use, directly or indirectly, any of the proceeds of any Loan for the purpose of an offer, payment, promise to pay, or authorization of the payment or giving of money, or anything else of value, to any Person in violation of any Anti-Corruption Law.

Section 6.19 Use of Proceeds. The Loan Parties will not and will not permit any of their Subsidiaries to use the proceeds of any Loan to directly, or to any Loan Party's knowledge after due care and inquiry, indirectly, to make any payments to a Sanctioned Entity or a Sanctioned Person, to fund any investments, loans or contributions in, or otherwise make such proceeds available to, a Sanctioned Entity or a Sanctioned Person, to fund any operations, activities or business of a Sanctioned Entity or a Sanctioned Person or in any other manner that would result in a violation of Sanctions by any Person and no part of the proceeds of any Loan will be used directly or, to any Loan Party's knowledge after due care and inquiry, indirectly in furtherance of an offer, payment, promise to pay, or authorization of the payment or giving of money, or anything else of value, to any Person in violation of any Sanctions, Anti-Corruption Laws or Anti-Terrorism Laws.

Section 6.20 Termination of Any Material Contract; Amendment of Any Outbound License Agreement.

(a) Borrower shall not, and shall cause its Subsidiaries not to, (i) without the prior written consent of the Administrative Agent (such consent not to be unreasoanbly witheld, conditioned or delayed), exercise any termination right granted thereunder to terminate any Material Contract in its entirety or otherwise agree with the applicable counterparty thereto to terminate any Material Contract in its entirety, or (ii) exercise any termination right granted thereunder to terminate any Material Contract in part or otherwise agree with the applicable counterparty thereto to terminate any Material Contract in part; provided however that, in each case ((i) and (ii)), Borrower entering into any agreement that includes provisions (A) permitting termination for convenience of a Material Contract or (B) acknowledging that a counterparty to a Material Contract has terminated for convenience such Material Contract, in each case ((A) and (B)) are not a breach of this Section 6.20 or an instance of Borrower "agreeing" to terminate a Material Contract.

(b) Borrower shall not, and shall cause its Subsidiaries not to, without the prior written consent of the Administrative Agent (such consent not to be unreasonably withheld, conditioned or delayed), take any action with respect to any Outbound License Agreement which would reasonably be expected to have a material adverse effect on the amount, timing or duration of any Royalties, Milestones, Profit Share Amounts or Joint Venture Proceeds payable to the Borrower under such Outbound License Agreement.

ARTICLE VII

GUARANTY

Section 7.1 Guaranty of the Obligations. Subject to the provisions of Section 7.2, Guarantors jointly and severally hereby irrevocably and unconditionally guaranty for the ratable benefit of the Beneficiaries the due and punctual payment in full of all Obligations when the same shall become due, whether at stated maturity, by required prepayment, declaration, acceleration, demand or otherwise (including amounts that would become due but for the operation of the automatic stay under Section 362(a) of the Bankruptcy Code, 11 U.S.C. § 362(a)) (collectively, the "Guaranteed Obligations").

Section 7.2 Contribution by Guarantors. All Guarantors desire to allocate among themselves, in a fair and equitable manner, their obligations arising under this Guaranty. Accordingly, in the event any payment or distribution is made on any date by a Guarantor under this Guaranty such that its Aggregate Payments exceeds its Fair Share as of such date, such Guarantor shall be entitled to a contribution from each of the other Guarantors in an amount sufficient to cause each Guarantor's Aggregate Payments to equal its Fair Share as of such date. "Fair Share" means, with respect to any Guarantor as of any date of determination, an amount equal to (a) the ratio of (i) the Fair Share Contribution Amount with respect to such Guarantor, to (ii) the aggregate of the Fair Share Contribution Amounts with respect to all Guarantors multiplied by, (b) the aggregate amount paid or distributed on or before such date by all Guarantors under this Guaranty in respect of the obligations Guaranteed. "Fair Share Contribution Amount" means, with respect to any Guarantor as of any date of determination, the maximum aggregate amount of the obligations of such Guarantor under this Guaranty that would not render its obligations hereunder subject to avoidance as a fraudulent transfer or conveyance under Section 548 of Title 11 of the United States Code or any comparable applicable provisions of state law; provided, solely for purposes of calculating the "Fair Share Contribution Amount" with respect to any Guarantor for purposes of this Section 7.2, any assets or liabilities of such Guarantor arising by virtue of any rights to subrogation, reimbursement or indemnification or any rights to or obligations of contribution hereunder shall not be considered as assets

or liabilities of such Guarantor. "Aggregate Payments" means, with respect to any Guarantor as of any date of determination, an amount equal to (A) the aggregate amount of all payments and distributions made on or before such date by such Guarantor in respect of this Guaranty (including, without limitation, in respect of this Section 7.2), minus (B) the aggregate amount of all payments received on or before such date by such Guarantor from the other Guarantors as contributions under this Section 7.2. The amounts payable as contributions hereunder shall be determined as of the date on which the related payment or distribution is made by the applicable Guarantor. The allocation among Guarantors of their obligations as set forth in this Section 7.2 shall not be construed in any way to limit the liability of any Guarantor hereunder. Each Guarantor is a third party beneficiary to the contribution agreement set forth in this Section 7.2.

Section 7.3 Payment by Guarantors. Subject to Section 7.2, Guarantors hereby jointly and severally agree, in furtherance of the foregoing and not in limitation of any other right which any Beneficiary may have at law or in equity against any Guarantor by virtue hereof, that upon the failure of Company to pay any of the Guaranteed Obligations when and as the same shall become due, whether at stated maturity, by required prepayment, declaration, acceleration, demand or otherwise (including amounts that would become due but for the operation of the automatic stay under Section 362(a) of the Bankruptcy Code, 11 U.S.C. § 362(a)), Guarantors will upon demand pay, or cause to be paid, in Cash, to Administrative Agent for the ratable benefit of Beneficiaries, an amount equal to the sum of the unpaid principal amount of all Guaranteed Obligations then due as aforesaid, accrued and Unpaid Interest on such Guaranteed Obligations (including interest which, but for Company's becoming the subject of a case under the Bankruptcy Code, would have accrued on such Guaranteed Obligations, whether or not a claim is allowed against Company for such interest in the related bankruptcy case) and all other Guaranteed Obligations then owed to Beneficiaries as aforesaid.

Section 7.4 Liability of Guarantors Absolute. Each Guarantor agrees that its obligations hereunder are irrevocable, absolute, independent and unconditional and shall not be affected by any circumstance which constitutes a legal or equitable discharge of a guarantor or surety other than payment in full of the Guaranteed Obligations. In furtherance of the foregoing and without limiting the generality thereof, each Guarantor agrees as follows:

(a) this Guaranty is a guaranty of payment when due and not of collectability. This Guaranty is a primary obligation of each Guarantor and not merely a contract of surety;

(b) Administrative Agent may enforce this Guaranty upon the occurrence of an Event of Default notwithstanding the existence of any dispute between Company and any Beneficiary with respect to the existence of such Event of Default;

(c) the obligations of each Guarantor hereunder are independent of the obligations of Company and the obligations of any other guarantor (including any other Guarantor) of the obligations of Company, and a separate action or actions may be brought and prosecuted against such Guarantor whether or not any action is brought against Company or any of such other guarantors and whether or not Company is joined in any such action or actions;

(d) payment by any Guarantor of a portion, but not all, of the Guaranteed Obligations shall in no way limit, affect, modify or abridge any Guarantor's liability for any portion of the Guaranteed Obligations which has not been paid. Without limiting the generality of the foregoing, if Administrative Agent is awarded a judgment in any suit brought to enforce any Guarantor's covenant to pay a portion of the Guaranteed Obligations, such judgment shall not be deemed to release such Guarantor from its covenant to pay the portion of the Guaranteed Obligations that is not the subject of such suit, and such judgment shall not, except to the extent satisfied by such Guarantor, limit, affect, modify or abridge any other Guarantor's liability hereunder in respect of the Guaranteed Obligations;

(e) solely with respect to the applicable Guarantor (and without limiting the Borrower's rights hereunder), any Beneficiary, upon such terms as it deems appropriate, without notice or demand and without affecting the validity or enforceability hereof or giving rise to any reduction, limitation, impairment, discharge or termination of any Guarantor's liability hereunder, from time to time may (i) renew, extend, accelerate, increase the rate of interest on, or otherwise change the time, place, manner or terms of payment of the Guaranteed Obligations; (ii) settle, compromise, release or discharge, or accept or refuse any offer of performance with respect to, or substitutions for, the Guaranteed Obligations or any agreement relating thereto and/or subordinate the payment of the same to the payment of any other obligations; (iii) request and accept other guaranties of the Guaranteed Obligations and take and hold security for the payment hereof or the Guaranteed Obligations; (iv) release, surrender, exchange, substitute, compromise, settle, rescind, waive, alter, subordinate or modify, with or without consideration, any security for payment of the Guaranteed Obligations, any other guaranties of the Guaranteed Obligations, or any other obligation of any Person (including any other Guarantor) with respect to the Guaranteed Obligations; (v) enforce and apply any security now or hereafter held by or for the benefit of such Beneficiary in respect hereof or the Guaranteed Obligations and direct the order or manner of sale thereof, or exercise any other right or remedy that such Beneficiary may have against any such security, in each case as such Beneficiary in its discretion may determine consistent herewith and any applicable security agreement, including foreclosure on any such security pursuant to one or more judicial or non-judicial sales, whether or not every aspect of any such sale is commercially reasonable, and even though such action operates to impair or extinguish any right of reimbursement or subrogation or other right or remedy of any Guarantor against Company or any security for the Guaranteed Obligations; and (vi) exercise any other rights available to it under the Loan Documents; and

(f) this Guaranty and the obligations of Guarantors hereunder shall be valid and enforceable and shall not be subject to any reduction, limitation, impairment, discharge or termination for any reason (other than payment in full in cash of the Guaranteed Obligations), including the occurrence of any of the following, whether or not any Guarantor shall have had notice or knowledge of any of them: (i) any failure or omission to assert or enforce or agreement or election not to assert or enforce, or the stay or enjoining, by order of court, by operation of law or otherwise, of the exercise or enforcement of, any claim or demand or any right, power or remedy (whether arising under the Loan Documents, at law, in equity or otherwise) with respect to the Guaranteed Obligations or any agreement relating thereto, or with respect to any other guaranty of or security for the payment of the Guaranteed Obligations; (ii) any rescission, waiver, amendment or modification of, or any consent to departure from, any of the terms or provisions (including provisions relating to events of default) hereof, any of the other Loan Documents or any agreement or instrument executed pursuant thereto, or of any other guaranty or security for the Guaranteed Obligations, in each case whether or not in accordance with the terms hereof or such Loan Document or any agreement relating to such other guaranty or security; (iii) the Guaranteed Obligations, or any agreement relating thereto, at any time being found to be illegal, invalid or unenforceable in any respect; (iv) the application of payments received from any source (other than payments received pursuant to the other Loan Documents or from the proceeds of any security for the Guaranteed Obligations, except to the extent such security also serves as collateral for indebtedness other than the Guaranteed Obligations) to the payment of indebtedness other than the Guaranteed Obligations, even though any Beneficiary might have elected to apply such payment to any part or all of the Guaranteed Obligations; (v) any Beneficiary's consent to the change, reorganization or termination of the corporate structure or existence of Borrower or any of its Subsidiaries and to any corresponding restructuring of the Guaranteed Obligations; (vi) any failure to perfect or continue perfection of a security interest in any collateral which secures any of the Guaranteed Obligations; (vii) any defenses, set offs or counterclaims which Company may allege or assert against any Beneficiary in respect of the Guaranteed Obligations, including failure of consideration, breach of warranty, payment, statute of frauds, statute of limitations, accord and satisfaction and usury; and (viii) any other act or thing or omission, or delay to do any other act or thing, which may or might in any manner or to any extent vary the risk of any Guarantor as an obligor in respect of the Guaranteed Obligations.

Section 7.5 Waivers by Guarantors. Each Guarantor hereby waives, for the benefit of Beneficiaries: (a) any right to require any Beneficiary, as a condition of payment or performance by such Guarantor, to (i) proceed against Company, any other guarantor (including any other Guarantor) of the Guaranteed Obligations or any other Person, (ii) proceed against or exhaust any security held from Company, any such other guarantor or any other Person, (iii) proceed against or have resort to any balance of any Deposit Account or credit on the books of any Beneficiary in favor of Company or any other Person, or (iv) pursue any other remedy in the power of any Beneficiary whatsoever; (b) any defense arising by reason of the incapacity, lack of authority or any disability or other defense of Company or any other Guarantor including any defense based on or arising out of the lack of validity or the unenforceability of the Guaranteed Obligations or any agreement or instrument relating thereto or by reason of the cessation of the liability of Company or any other Guarantor from any cause other than payment in full in cash of the Guaranteed Obligations; (c) any defense based upon any statute or rule of law which provides that the obligation of a surety must be neither larger in amount nor in other respects more burdensome than that of the principal; (d) any defense based upon any Beneficiary's errors or omissions in the administration of the Guaranteed Obligations, except behavior which amounts to bad faith; (e) (i) any principles or provisions of law, statutory or otherwise, which are or might be in conflict with the terms hereof and any legal or equitable discharge of such Guarantor's obligations hereunder, (ii) the benefit of any statute of limitations affecting such Guarantor's liability hereunder or the enforcement hereof, (iii) any rights to set offs, recoupments and counterclaims, and (iv) promptness, diligence and any requirement that any Beneficiary protect, secure, perfect or insure any security interest or lien or any property subject thereto; (f) notices, demands, presentments, protests, notices of protest, notices of dishonor and notices of any action or inaction, including acceptance hereof, notices of default hereunder or any agreement or instrument related thereto, notices of any renewal, extension or modification of the Guaranteed Obligations or any agreement related thereto, notices of any extension of credit to Company and notices of any of the matters referred to in Section 7.4 and any right to consent to any thereof; and (g) any defenses or benefits that may be derived from or afforded by law which limit the liability of or exonerate guarantors or sureties, or which may conflict with the terms hereof.

Section 7.6 Guarantors' Rights of Subrogation, Contribution, Etc. Until the Guaranteed Obligations shall have been indefeasibly paid in cash in full and the Delayed Draw Term Loan Commitments have been terminated, each Guarantor hereby waives any claim, right or remedy, direct or indirect, that such Guarantor now has or may hereafter have against Company or any other Guarantor or any of its assets in connection with this Guaranty or the performance by such Guarantor of its obligations hereunder, in each case whether such claim, right or remedy arises in equity, under contract, by statute, under common law or otherwise and including without limitation (a) any right of subrogation, reimbursement or indemnification that such Guarantor now has or may hereafter have against Company with respect to the Guaranteed Obligations, (b) any right to enforce, or to participate in, any claim, right or remedy that any Beneficiary now has or may hereafter have against Company, and (c) any benefit of, and any right to participate in, any collateral or security now or hereafter held by any Beneficiary. In addition, until the Guaranteed Obligations shall have been indefeasibly paid in full and the Delayed Draw Term Loan Commitments have been terminated, each Guarantor shall withhold exercise of any right of contribution such Guarantor may have against any other guarantor (including any other Guarantor) of the Guaranteed Obligations, including, without limitation, any such right of contribution as contemplated by Section 7.2. Each Guarantor further agrees that, to the extent the waiver or agreement to withhold the exercise of its rights of subrogation, reimbursement, indemnification and contribution as set forth herein is found by a court of competent jurisdiction to be void or voidable for any reason, any rights of subrogation, reimbursement or indemnification such Guarantor may have against Company or against any collateral or security, and any rights of contribution such Guarantor may have against any such other guarantor, shall be junior and subordinate to any rights any Beneficiary may have against Company, to all right, title and interest any Beneficiary may have in any such collateral or security, and to any right any Beneficiary may have against such other guarantor. If any amount shall be paid to any Guarantor on account of any such

subrogation, reimbursement, indemnification or contribution rights at any time when all Guaranteed Obligations shall not have been finally and indefeasibly paid in full, such amount shall be held in trust for Administrative Agent on behalf of Beneficiaries and shall forthwith be paid over to Administrative Agent for the benefit of Beneficiaries to be credited and applied against the Guaranteed Obligations, whether matured or unmatured, in accordance with the terms hereof.

Section 7.7 Subordination of Other Obligations. Any Indebtedness of Company or any Guarantor now or hereafter held by any Guarantor is hereby subordinated in right of payment to the Guaranteed Obligations, and any such indebtedness collected or received by such Guarantor after an Event of Default has occurred and is continuing shall be held in trust for Administrative Agent on behalf of the Beneficiaries shall forthwith be paid over to Administrative Agent for the benefit of Beneficiaries to be credited and applied against the Guaranteed Obligations but without affecting, impairing or limiting in any manner the liability of such Guarantor under any other provision hereof.

Section 7.8 Continuing Guaranty. This Guaranty is a continuing guaranty and shall remain in effect until the Termination Date. Each Guarantor hereby irrevocably waives any right to revoke this Guaranty as to future transactions giving rise to any Guaranteed Obligations.

Section 7.9 Authority of Guarantors or Company. It is not necessary for any Beneficiary to inquire into the capacity or powers of any Guarantor or Company or the officers, directors or agents acting or purporting to act on behalf of any of them.

Section 7.10 Financial Condition of Company. Any Credit Extension may be made to Company or continued from time to time without notice to or authorization from any Guarantor regardless of the financial or other condition of Company at the time of any such grant or continuation is entered into, as the case may be. No Beneficiary shall have any obligation to disclose or discuss with any Guarantor its assessment, or any Guarantor's assessment, of the financial condition of Company. Each Guarantor has adequate means to obtain information from Company on a continuing basis concerning the financial condition of Company and its ability to perform its obligations under the Loan Documents, and each Guarantor assumes the responsibility for being and keeping informed of the financial condition of Company and of all circumstances bearing upon the risk of non-payment of the Guaranteed Obligations. Each Guarantor hereby waives and relinquishes any duty on the part of any Beneficiary to disclose any matter, fact or thing relating to the business, operations or conditions of Company now known or hereafter known by any Beneficiary.

Section 7.11 Bankruptcy, Etc.

(a) So long as any Guaranteed Obligations remain outstanding, no Guarantor shall, without the prior written consent of Administrative Agent acting pursuant to the instructions of Required Lenders, commence or join with any other Person in commencing any bankruptcy, reorganization or insolvency case or proceeding of or against Company or any other Guarantor. The obligations of Guarantors hereunder shall not be reduced, limited, impaired, discharged, deferred, suspended or terminated by any case or proceeding, voluntary or involuntary, involving the bankruptcy, insolvency, receivership, administration, reorganization, liquidation or arrangement of Company or any other Guarantor or by any defense which Company or any other Guarantor may have by reason of the order, decree or decision of any court or administrative body resulting from any such proceeding.

(b) Each Guarantor acknowledges and agrees that any interest on any portion of the Guaranteed Obligations which accrues after the commencement of any case or proceeding referred to in clause (a) above (or, if interest on any portion of the Guaranteed Obligations ceases to accrue by operation of law by reason of the commencement of such case or proceeding, such interest as would have accrued on

such portion of the Guaranteed Obligations if such case or proceeding had not been commenced) shall be included in the Guaranteed Obligations because it is the intention of Guarantors and Beneficiaries that the Guaranteed Obligations which are guaranteed by Guarantors pursuant hereto should be determined without regard to any rule of law or order which may relieve Company of any portion of such Guaranteed Obligations. Guarantors will permit any trustee in bankruptcy, receiver, administrator, debtor in possession, assignee for the benefit of creditors or similar person to pay Administrative Agent, or allow the claim of Administrative Agent in respect of, any such interest accruing after the date on which such case or proceeding is commenced.

(c) In the event that all or any portion of the Guaranteed Obligations are paid by Company, the obligations of Guarantors hereunder shall continue and remain in full force and effect or be reinstated, as the case may be, in the event that all or any part of such payment(s) are rescinded or recovered directly or indirectly from any Beneficiary as a preference, fraudulent transfer or otherwise, and any such payments which are so rescinded or recovered shall constitute Guaranteed Obligations for all purposes hereunder.

Section 7.12 Discharge of Guaranty Upon Sale of Guarantor. If all of the Capital Stock of any Guarantor or any of its successors in interest hereunder shall be sold or otherwise disposed of (including by merger or consolidation) in accordance with the terms and conditions hereof, the Guaranty of such Guarantor or such successor in interest, as the case may be, hereunder shall automatically be discharged and released without any further action by any Beneficiary or any other Person effective as of the time of such Asset Sale.

ARTICLE VIII

EVENTS OF DEFAULT

Section 8.1 Events of Default. If any one or more of the following conditions or events shall occur:

(a) Failure to Make Payments When Due. Failure by Company to pay (i) the principal of and premium, if any, on any Term Loan when due whether at stated maturity, by acceleration or otherwise; or (ii) within [**] when due any interest on any Term Loan or any fee or any other amount due hereunder; or

(b) Default in Other Agreements. (i) Failure of any Loan Party or any Loan Party's Subsidiaries to pay when due any principal of or interest on or any other amount payable in respect of one or more items of Indebtedness (other than Indebtedness referred to in Section 8.1(a)) in a principal amount in excess of the Threshold Amount, in each case beyond the grace period, if any, provided therefor, or (ii) breach or default by any Loan Party with respect to any other material term of (A) one or more items of Indebtedness in the principal amount referred to in clause (i) above, or (B) any loan agreement, mortgage, indenture or other agreement relating to such item(s) of Indebtedness, in each case beyond the grace period, if any, provided therefor, if the effect of such breach or default is to cause, or to permit the holder or holders of that Indebtedness (or a trustee on behalf of such holder or holders), to cause, that Indebtedness to become or be declared due and payable (or subject to a compulsory repurchase or redeemable) or to require the prepayment, redemption, repurchase or defeasance of, or to cause Borrower or any of Borrower's Subsidiaries to make any offer to prepay, redeem, repurchase or defease such Indebtedness, prior to its stated maturity or the stated maturity of any underlying obligation, as the case may be; or

(c) Breach of Certain Covenants. Failure of any Loan Party to perform or comply with any term or condition contained in Section 2.2, Section 5.1(a), (b), (c), (d), (e), (f), (j)-(o), (q) and (s),

Section 5.2, Section 5.3, Section 5.5, Section 5.8, Section 5.10, Section 5.13, Section 5.14, Section 5.15 or Article VI; or

(d) Breach of Representations, Etc. Any representation, warranty, certification or other statement made or deemed made by any Loan Party in any Loan Document or in any statement or certificate at any time given by any Loan Party or any of Borrower's Subsidiaries in writing pursuant hereto or thereto or in connection herewith or therewith shall be false in any material respect (except that such materiality qualifier shall not be applicable to any representations or warranties that already are qualified or modified as to "materiality" or "Material Adverse Effect" in the text thereof, which representations and warranties shall be true and correct in all respects subject to such qualification) as of the date made or deemed made; or

(e) Other Defaults Under Loan Documents. Any Loan Party shall default in the performance of or compliance with any term contained herein or any of the other Loan Documents, other than any such term referred to in any other Section of this Section 8.1, and such default shall not have been remedied or waived within [**] after the earlier of (i) an officer of such Loan Party becoming aware of such default, or (ii) receipt by Company of notice from Administrative Agent or any Lender of such default; or

(f) Involuntary Bankruptcy; Appointment of Receiver, Etc. (i) A court of competent jurisdiction shall enter a decree or order for relief in respect of Borrower or any of its Subsidiaries in an involuntary case under the Bankruptcy Code or under any other applicable bankruptcy, insolvency or similar law now or hereafter in effect, which decree or order is not stayed; or any other similar relief shall be granted under any applicable federal or state law; or (ii) an involuntary case shall be commenced against Borrower or any of its Subsidiaries under the Bankruptcy Code or under any other applicable bankruptcy, insolvency or similar law now or hereafter in effect; or a decree or order of a court having jurisdiction in the premises for the appointment of a receiver, administrator, liquidator, sequestrator, trustee, custodian or other officer having similar powers over Borrower or any of its Subsidiaries, or over all or a substantial part of its property, shall have been entered; or there shall have occurred the involuntary appointment of an interim receiver, administrator, trustee or other custodian of Borrowers or any of its Subsidiaries for all or a substantial part of its property; or a warrant of attachment, execution or similar process shall have been issued against any substantial part of the property of Borrower or any of its Subsidiaries, and any such event described in this clause (ii) shall continue for [**] without having been dismissed, bonded or discharged; or

(g) Voluntary Bankruptcy; Appointment of Receiver, Etc. (i) Borrower or any of its Subsidiaries shall have an order for relief entered with respect to it or shall commence a voluntary case under the Bankruptcy Code or under any other applicable bankruptcy, insolvency or similar law now or hereafter in effect, or shall consent to the entry of an order for relief in an involuntary case, or to the conversion of an involuntary case to a voluntary case, under any such law, or shall consent to the appointment of or taking possession by a receiver, administrator, trustee or other custodian for all or a substantial part of its property; or Borrower or any of its Subsidiaries shall make any assignment for the benefit of creditors; or (ii) Borrower or any of its Subsidiaries shall be unable, or shall fail generally, or shall admit in writing its inability, to pay its debts as such debts become due; or the Board of Directors (or similar governing body) of Borrower or any of its Subsidiaries shall adopt any resolution or otherwise authorize any action to approve any of the actions referred to herein or in Section 8.1(f); or

(h) Judgments and Attachments. Any money judgment, writ or warrant of attachment or similar process involving in any individual case an amount in excess of the Threshold Amount (to the extent not adequately covered by insurance as to which a solvent and unaffiliated insurance company has acknowledged coverage) shall be entered or filed against Borrower or any of its Subsidiaries or any of their

respective assets and shall remain undischarged, unvacated, unbonded or unstayed for a period of [**] (or in any event later than [**] prior to the date of any proposed sale thereunder); or

(i) Dissolution. Any order, judgment or decree shall be entered against any Loan Party or any of its Subsidiaries decreeing the dissolution or split up of such Loan Party or any of its Subsidiaries and such order shall remain undischarged or unstayed for a period in excess of [**]; or

(j) Change of Control. A Change of Control shall occur; or

(k) Guaranties, Collateral Documents and other Loan Documents. At any time after the execution and delivery thereof, (i) the Guaranty for any reason, other than the satisfaction in full in cash of all Obligations, shall cease to be in full force and effect (other than in accordance with its terms) or shall be declared to be null and void or any Guarantor shall repudiate its obligations thereunder, (ii) this Agreement or any Collateral Document ceases to be in full force and effect (other than by reason of a release of Collateral in accordance with the terms hereof or thereof or the satisfaction in full in cash of the Obligations in accordance with the terms hereof) or shall be declared null and void, or Administrative Agent shall not have or shall cease to have a valid and perfected Lien in any Collateral purported to be covered by the Collateral Documents with the priority required by the relevant Collateral Document, in each case for any reason other than the failure of Administrative Agent or any Secured Party to take any action within its control, or (iii) any Loan Party shall contest the validity or enforceability of any Loan Document in writing or deny in writing that it has any further liability, including with respect to future advances by Lenders, under any Loan Document to which it is a party; or

(l) Proceedings. The indictment of any Loan Party or any of its Subsidiaries under any criminal statute, or commencement of criminal or civil proceedings against any Loan Party or any of its Subsidiaries pursuant to which statute or proceedings the penalties or remedies sought or available include forfeiture to any Governmental Authority of any material portion of the property of such Person and such event has resulted or would reasonably be expected to result in a Material Adverse Effect; or

(m) ERISA. The occurrence of any ERISA Event which, individually or in the aggregate, has resulted or would reasonably be expected to result in a Material Adverse Effect; or

(n) [Reserved];

(o) Regulatory Event. A Regulatory Action or a Material Regulatory Liability with respect to any Product has occurred, and such event has resulted or would reasonably be expected to result in a Material Adverse Effect; or

(p) Cessation of Business. (i) Any Loan Party or any of its Subsidiaries is enjoined, restrained or in any way prevented by the order of any court or any Governmental Authority from conducting all or any material part of its business for more than [**]; (ii) any other cessation of a substantial part of the business of Company or any of its Subsidiaries for a period which materially and adversely affects Company or any of its Subsidiaries; or (iii) any material damage to, or loss, theft or destruction of, any Collateral whether or not insured or any strike, lockout, labor dispute, embargo, condemnation, act of God or public enemy, or other casualty which causes, for more than [**], the cessation or substantial curtailment of revenue producing activities, if any such event or circumstance referred to in this subclause (iii) could reasonably be expected to have a Material Adverse Effect.

Section 8.2 Remedies. Upon the occurrence and during the continuance of any Event of Default, Administrative Agent may, and shall at the request of the Required Lenders:

(a) declare that all or any portion of the Delayed Draw Term Loan Commitments shall immediately terminate and the unpaid principal amount of all outstanding Term Loans, all interest accrued and unpaid thereon, and all other amounts owing or payable hereunder or under any other Loan Document to be immediately due and payable; without presentment, demand, protest or other notice of any kind, all of which are hereby expressly waived by each Loan Party; and/or

(b) exercise on behalf of themselves and the Lenders all rights and remedies available to them and the Lenders under the Loan Documents or applicable law or in equity or under any other instrument, document or agreement now existing or hereafter arising;

provided, that upon the occurrence of any event specified in Section 8.1(f) or (g) above, the unpaid principal amount of all outstanding Term Loans and all interest and other amounts as aforesaid shall automatically become due and payable without further act of Administrative Agent or any Lender.

Section 8.3 Rights Not Exclusive. The rights provided for in this Agreement and the other Loan Documents are cumulative and are not exclusive of any other rights, powers, privileges or remedies provided by law or in equity, or under any other instrument, document or agreement now existing or hereafter arising.

ARTICLE IX

ADMINISTRATIVE AGENT

Section 9.1 Appointment of Administrative Agent.

(a) Sixth Street is hereby appointed Administrative Agent hereunder and under the other Loan Documents and each Lender hereby authorizes Sixth Street, in such capacity, to act as its agent in accordance with the terms hereof and the other Loan Documents to perform, exercise and enforce any and all other rights and remedies of the Lenders with respect to the Loan Parties, the Obligations or otherwise related to any of same to the extent reasonably incidental to the exercise by Administrative Agent of the rights and remedies specifically authorized to be exercised by Administrative Agent by the terms of this Agreement or any other Loan Parties.

(b) Administrative Agent hereby agrees to act upon the express conditions contained herein and the other Loan Documents, as applicable. The provisions of this Article IX (other than Section 9.8(a)(ii)) are solely for the benefit of Administrative Agent and Lenders and no Loan Party shall have any rights as a third party beneficiary of any of the provisions thereof. In performing its functions and duties hereunder, Administrative Agent shall act solely as an agent of Lenders and does not assume and shall not be deemed to have assumed any obligation towards or relationship of agency or trust with or for Borrower or any of its Subsidiaries.

Section 9.2 Powers and Duties. Each Lender irrevocably authorizes Administrative Agent to take such action on such Lender's behalf and to exercise such powers, rights and remedies hereunder and under the other Loan Documents as are specifically delegated or granted to Administrative Agent by the terms hereof and thereof, together with such powers, rights and remedies as are reasonably incidental thereto. Administrative Agent shall have only those duties and responsibilities that are expressly specified herein and the other Loan Documents. Administrative Agent may exercise such powers, rights and remedies and perform such duties by or through its agents or employees Administrative Agent shall not have, by reason hereof or any of the other Loan Documents, a fiduciary relationship in respect of any Lender; and nothing herein or any of the other Loan Documents, expressed or implied, is intended to or

shall be so construed as to impose upon Administrative Agent any obligations in respect hereof or any of the other Loan Documents except as expressly set forth herein or therein.

Section 9.3 General Immunity.

(a) No Responsibility for Certain Matters. Administrative Agent shall not be responsible to any Lender for the execution, effectiveness, genuineness, validity, enforceability, collectability or sufficiency hereof or any other Loan Document or for any representations, warranties, recitals or statements made herein or therein or made in any written or oral statements or in any financial or other statements, instruments, reports or certificates or any other documents furnished or made by Administrative Agent to Lenders or by or on behalf of any Loan Party to Administrative Agent or any Lender in connection with the Loan Documents and the transactions contemplated thereby or for the financial condition or business affairs of any Loan Party or any other Person liable for the payment of any Obligations, nor shall Administrative Agent be required to ascertain or inquire as to the performance or observance of any of the terms, conditions, provisions, covenants or agreements contained in any of the Loan Documents or as to the use of the proceeds of the Loans or as to the existence or possible existence of any Event of Default or Default or to make any disclosures with respect to the foregoing. Anything contained herein to the contrary notwithstanding, Administrative Agent shall not have any liability arising from confirmations of the amount of outstanding Term Loans or the component amounts thereof.

(b) Exculpatory Provisions. Neither Administrative Agent nor any of its officers, partners, directors, employees or agents shall be liable to Lenders for any action taken or omitted by Administrative Agent under or in connection with any of the Loan Documents except to the extent caused by Administrative Agent's gross negligence or willful misconduct, as determined by a court of competent jurisdiction in a final, non-appealable order. Administrative Agent shall be entitled to refrain from any act or the taking of any action (including the failure to take an action) in connection herewith or any of the other Loan Documents or from the exercise of any power, discretion or authority vested in it hereunder or thereunder unless and until Administrative Agent shall have received instructions in respect thereof from Required Lenders (or such other Lenders as may be required to give such instructions under Section 10.5) and, upon receipt of such instructions from Required Lenders (or such other Lenders, as the case may be), Administrative Agent shall be entitled to act or (where so instructed) refrain from acting, or to exercise such power, discretion or authority, in accordance with such instructions. Without prejudice to the generality of the foregoing, (i) Administrative Agent shall be entitled to rely, and shall be fully protected in relying, upon any communication, instrument or document believed by it to be genuine and correct and to have been signed or sent by the proper Person or Persons, and shall be entitled to rely and shall be protected in relying on opinions and judgments of attorneys (who may be attorneys for Borrower and its Subsidiaries), accountants, experts and other professional advisors selected by it; and (ii) no Lender shall have any right of action whatsoever against Administrative Agent as a result of Administrative Agent acting or (where so instructed) refraining from acting hereunder or any of the other Loan Documents in accordance with the instructions of Required Lenders (or such other Lenders as may be required to give such instructions under Section 10.5).

(c) Notice of Default. Administrative Agent shall not be deemed to have knowledge or notice of the occurrence of any Default or Event of Default, except with respect to Events of Default in the payment of principal, interest and fees required to be paid to Administrative Agent for the account of the Lenders, unless Administrative Agent shall have received written notice from a Lender or the Loan Party referring to this Agreement, describing such Default or Event of Default and stating that such notice is a "notice of default." Administrative Agent will notify the Lenders of its receipt of any such notice. Administrative Agent shall take such action with respect to any such Default or Event of Default as may be directed by the Required Lenders in accordance with Article VIII; provided, however, that unless and until Administrative Agent has received any such direction, Administrative Agent may (but shall not be obligated

to) take such action, or refrain from taking such action, with respect to such Default or Event of Default as it shall deem advisable or in the best interest of the Lenders.

Section 9.4 Administrative Agent Entitled to Act as Lender. The agency hereby created shall in no way impair or affect any of the rights and powers of, or impose any duties or obligations upon, Administrative Agent in its individual capacity as a Lender hereunder. With respect to its participation in the Term Loans, Administrative Agent shall have the same rights and powers hereunder as any other Lender and may exercise the same as if it were not performing the duties and functions delegated to it hereunder, and the term "Lender" shall, unless the context clearly otherwise indicates, include Administrative Agent in its individual capacity. Administrative Agent and its Affiliates may accept deposits from, lend money to, own securities of, and generally engage in any kind of banking, trust, financial advisory or other business with Borrower or any of its Affiliates as if it were not performing the duties specified herein, and may accept fees and other consideration from Company for services in connection herewith and otherwise without having to account for the same to Lenders.

Section 9.5 Lenders' Representations, Warranties and Acknowledgment.

(a) Each Lender represents and warrants that it has made its own independent investigation of the financial condition and affairs of Borrower and its Subsidiaries in connection with Credit Extensions hereunder and that it has made and shall continue to make its own appraisal of the creditworthiness of Borrower and its Subsidiaries. Administrative Agent shall not have any duty or responsibility, either initially or on a continuing basis, to make any such investigation or any such appraisal on behalf of Lenders or to provide any Lender with any credit or other information with respect thereto, whether coming into its possession before the making of the Term Loans or at any time or times thereafter, and Administrative Agent shall not have any responsibility with respect to the accuracy of or the completeness of any information provided to Lenders.

(b) Each Lender, by delivering its signature page to this Agreement and funding its Term Loan on the Closing Date, shall be deemed to have acknowledged receipt of, and consented to and approved, each Loan Document and each other document required to be approved by Administrative Agent, Required Lenders or Lenders, as applicable on the Closing Date.

Section 9.6 Right to Indemnity. EACH LENDER, IN PROPORTION TO ITS PRO RATA SHARE, SEVERALLY AGREES TO INDEMNIFY ADMINISTRATIVE AGENT, ITS AFFILIATES AND ITS RESPECTIVE OFFICERS, PARTNERS, DIRECTORS, TRUSTEES, EMPLOYEES AND AGENTS OF ADMINISTRATIVE AGENT (EACH, AN "INDEMNITEE AGENT PARTY"), TO THE EXTENT THAT SUCH INDEMNITEE AGENT PARTY SHALL NOT HAVE BEEN REIMBURSED BY ANY LOAN PARTY, FOR AND AGAINST ANY AND ALL LIABILITIES, OBLIGATIONS, LOSSES, DAMAGES, PENALTIES, ACTIONS, JUDGMENTS, SUITS, COSTS, EXPENSES (INCLUDING COUNSEL FEES AND DISBURSEMENTS) OR DISBURSEMENTS OF ANY KIND OR NATURE WHATSOEVER WHICH MAY BE IMPOSED ON, INCURRED BY OR ASSERTED AGAINST SUCH INDEMNITEE AGENT PARTY IN EXERCISING ITS POWERS, RIGHTS AND REMEDIES OR PERFORMING ITS DUTIES HEREUNDER OR UNDER THE OTHER LOAN DOCUMENTS OR OTHERWISE IN ITS CAPACITY AS SUCH INDEMNITEE AGENT PARTY IN ANY WAY RELATING TO OR ARISING OUT OF THIS AGREEMENT OR THE OTHER LOAN DOCUMENTS, IN ALL CASES, WHETHER OR NOT CAUSED BY OR ARISING, IN WHOLE OR IN PART, OUT OF THE COMPARATIVE, CONTRIBUTORY, OR SOLE NEGLIGENCE OF SUCH INDEMNITEE AGENT PARTY; PROVIDED, NO LENDER SHALL BE LIABLE FOR ANY PORTION OF SUCH LIABILITIES, OBLIGATIONS, LOSSES, DAMAGES, PENALTIES, ACTIONS, JUDGMENTS, SUITS, COSTS, EXPENSES OR DISBURSEMENTS RESULTING FROM SUCH INDEMNITEE AGENT PARTY'S GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, AS

DETERMINED BY A COURT OF COMPETENT JURISDICTION IN A FINAL, NON-APPEALABLE ORDER. IF ANY INDEMNITY FURNISHED TO ANY INDEMNITEE AGENT PARTY FOR ANY PURPOSE SHALL, IN THE OPINION OF SUCH INDEMNITEE AGENT PARTY, BE INSUFFICIENT OR BECOME IMPAIRED, SUCH INDEMNITEE AGENT PARTY MAY CALL FOR ADDITIONAL INDEMNITY AND CEASE, OR NOT COMMENCE, TO DO THE ACTS INDEMNIFIED AGAINST UNTIL SUCH ADDITIONAL INDEMNITY IS FURNISHED; PROVIDED, IN NO EVENT SHALL THIS SENTENCE REQUIRE ANY LENDER TO INDEMNIFY ANY INDEMNITEE AGENT PARTY AGAINST ANY LIABILITY, OBLIGATION, LOSS, DAMAGE, PENALTY, ACTION, JUDGMENT, SUIT, COST, EXPENSE OR DISBURSEMENT IN EXCESS OF SUCH LENDER'S PRO RATA SHARE THEREOF; AND PROVIDED FURTHER, THIS SENTENCE SHALL NOT BE DEEMED TO REQUIRE ANY LENDER TO INDEMNIFY ANY INDEMNITEE AGENT PARTY AGAINST ANY LIABILITY, OBLIGATION, LOSS, DAMAGE, PENALTY, ACTION, JUDGMENT, SUIT, COST, EXPENSE OR DISBURSEMENT DESCRIBED IN THE PROVISO IN THE IMMEDIATELY PRECEDING SENTENCE.

Section 9.7 Successor Administrative Agent.

(a) Administrative Agent may resign at any time by giving thirty days' (or such shorter period as shall be agreed by the Required Lenders) prior written notice thereof to Lenders and Company. Upon any such notice of resignation, Required Lenders shall have the right, upon five Business Days' notice to Company, to appoint a successor Administrative Agent. If no successor shall have been so appointed by the Required Lenders and shall have accepted such appointment within thirty (30) days after the retiring Administrative Agent gives notice of its resignation, then the retiring Administrative Agent may, on behalf of the Lenders appoint a successor Administrative Agent from among the Lenders. Upon the acceptance of any appointment as Administrative Agent hereunder by a successor Administrative Agent that successor Administrative Agent shall thereupon succeed to and become vested with all the rights, powers, privileges and duties of the retiring Administrative Agent, and the retiring Administrative Agent shall promptly (i) transfer to such successor Administrative Agent all sums, securities or Capital Stock and other items of Collateral held under the Collateral Documents, together with all records and other documents necessary or appropriate in connection with the performance of the duties of the successor Administrative Agent under the Loan Documents, and (ii) execute and deliver to such successor Administrative Agent such amendments to financing statements, and take such other actions, as may be necessary or appropriate in connection with the assignment to such successor Administrative Agent of the security interests created under the Collateral Documents, whereupon such retiring Administrative Agent shall be discharged from its duties and obligations hereunder. After any retiring Administrative Agent's resignation hereunder as Administrative Agent, the provisions of this Article IX shall inure to its benefit as to any actions taken or omitted to be taken by it while it was Administrative Agent hereunder.

(b) Notwithstanding anything herein to the contrary, Administrative Agent may assign its rights and duties as Administrative Agent, as applicable, hereunder to an Affiliate of Sixth Street without the prior written consent of, or prior written notice to, Company or the Lenders; provided that Company and the Lenders may deem and treat such assigning Administrative Agent as Administrative Agent for all purposes hereof, unless and until such assigning Administrative Agent provides written notice to Company and the Lenders of such assignment. Upon such assignment such Affiliate shall succeed to and become vested with all rights, powers, privileges and duties as Administrative Agent hereunder and under the other Loan Documents.

(c) Administrative Agent may perform any and all of its duties and exercise its rights and powers under this Agreement or under any other Loan Document by or through any one or more sub-agents appointed by Administrative Agent. Administrative Agent and any such sub-agent may perform any and all of its duties and exercise its rights and powers by or through their respective Affiliates. The

exculpatory, indemnification and other provisions of Section 9.3, Section 9.6 and of this Section 9.7 shall apply to any of the Affiliates of Administrative Agent and shall apply to their respective activities in connection with the syndication of the credit facilities provided for herein as well as activities as Administrative Agent. All of the rights, benefits and privileges (including the exculpatory and indemnification provisions) of Section 9.3, Section 9.6 and of this Section 9.7 shall apply to any such sub-agent and to the Affiliates of any such sub-agent, and shall apply to their respective activities as sub-agent as if such sub-agent and Affiliates were named herein. Notwithstanding anything herein to the contrary, with respect to each sub-agent appointed by Administrative Agent, (i) such sub-agent shall be a third party beneficiary under this Agreement with respect to all such rights, benefits and privileges (including exculpatory and rights to indemnification) and shall have all of the rights, benefits and privileges of a third party beneficiary, including an independent right of action to enforce such rights, benefits and privileges (including exculpatory rights and rights to indemnification) directly, without the consent or joinder of any other Person, against any or all of the Loan Parties and the Lenders, (ii) such rights, benefits and privileges (including exculpatory rights and rights to indemnification) shall not be modified or amended without the consent of such sub-agent, and (iii) such sub-agent shall only have obligations to Administrative Agent and not to any Loan Party, Lender or any other Person and no Loan Party, Lender or any other Person shall have the rights, directly or indirectly, as a third party beneficiary or otherwise, against such sub-agent.

Section 9.8 Collateral Documents and Guaranty.

(a) Administrative Agent under Collateral Documents and Guaranty. Each Lender hereby further authorizes Administrative Agent on behalf of and for the benefit of Lenders, to be the agent for and representative of Lenders with respect to the Guaranty, the Collateral and the Collateral Documents. Subject to Section 10.5 and without limiting subsection (b) below, without further written consent or authorization from Lenders, Administrative Agent (i) may execute any documents or instruments necessary to (A) release any Lien encumbering any item of Collateral that is the subject of a sale or other disposition of assets permitted hereby or to which Required Lenders (or such other Lenders as may be required to give such consent under Section 10.5) have otherwise consented, or (B) release any Guarantor from the Guaranty pursuant to Section 7.12 or with respect to which Required Lenders (or such other Lenders as may be required to give such consent under Section 10.5) have otherwise consented and (ii) shall (A) enter into an intercreditor agreement, on terms and in form and substance reasonably satisfactory to Administrative Agent with respect to any Permitted Royalty Transaction, and (B) if requested by Borrower, enter into customary non-disturbance agreements or other similar agreements, in form and substance reasonably satisfactory to the Administrative Agent, in connection with the entry by Borrower or any Subsidiary into any Permitted Product Agreement; provided, that prior to or concurrently with making any request pursuant to this Section 9.8(a)(ii)(C), Borrower shall have used commercially reasonable efforts to negotiate the Permitted Product Agreement without a Lien release (and shall provide Administrative Agent reasonable documentation of the same); provided, further that the Administrative Agent, on behalf of and for the benefit of Lenders, will have a first priority security interest in all cash proceeds received or to be received by Borrower or any Subsidiary from such Permitted Product Agreement and Borrower shall use commercially reasonable efforts to grant to Administrative Agent, on behalf of and for the benefit of Lenders, a first priority security in such Permitted Product Agreement.

(b) The Lenders and the Administrative Agent further hereby irrevocably agree that the Administrative Agent shall take all action necessary to release the Liens granted to the Administrative Agent by the Loan Parties on any Collateral (and the Lenders authorize the Administrative Agent to effect and document such release) (i) in full, upon the Termination Date, (ii) that is the subject of a sale or other disposition of assets permitted under this Agreement or to which Required Lenders (or such other Lenders as may be required to give such consent under Section 10.5) have otherwise consented, (iii) to the extent such Collateral is comprised of property leased or licensed to a Loan Party, upon termination or expiration of such lease or license, (iv) if the release of such Lien is approved, authorized or ratified in writing by the

Required Lenders (or such other percentage of the Lenders whose consent may be required in accordance with Section 10.05), (v) to the extent the property constituting such Collateral is owned by any Guarantor, upon the release of such Guarantor from its obligations under the Guaranty in accordance with the terms of this Agreement, or (vii) if such assets constitute Excluded Assets. The Administrative Agent shall be entitled to rely on a certificate in which the Borrower certifies that the Liens granted to the Administrative Agent on such assets may be released pursuant hereto or such assets constitute Excluded Assets or such Guarantor is an Excluded Subsidiary without further inquiry. The Lenders hereby authorize and instruct the Administrative Agent to, and the Administrative Agent agrees to, execute and deliver any instruments, acknowledgements, documents and agreements reasonably necessary or reasonably requested by the Borrower to evidence and confirm the release of any Guarantor or Collateral pursuant to the foregoing provisions of this paragraph, all without the further consent or joinder of any Lender and without any representation or warranty of any such Agent.

(c) Right to Realize on Collateral and Enforce Guaranty. Anything contained in any of the Loan Documents to the contrary notwithstanding, Company, Administrative Agent and each Lender hereby agree that (i) no Lender shall have any right individually to realize upon any of the Collateral or to enforce the Guaranty, it being understood and agreed that all powers, rights and remedies hereunder may be exercised solely by Administrative Agent, on behalf of Lenders in accordance with the terms hereof and all powers, rights and remedies under the Collateral Documents may be exercised solely by Administrative Agent, and (ii) in the event of a foreclosure by Administrative Agent on any of the Collateral pursuant to a public or private sale or any sale of the Collateral in a case under the Bankruptcy Code, Administrative Agent or any Lender may be the purchaser of any or all of such Collateral at any such sale and Administrative Agent, as agent for and representative of Secured Parties (but not any Lender or Lenders in its or their respective individual capacities unless Required Lenders shall otherwise agree in writing) shall be entitled, for the purpose of bidding and making settlement or payment of the purchase price for all or any portion of the Collateral sold at any such public sale, to use and apply any of the Obligations as a credit on account of the purchase price for any collateral payable by Administrative Agent at such sale. The Secured Parties hereby irrevocably authorize the Administrative Agent, at the direction of the Required Lenders, to credit bid all or any portion of the Obligations (including by accepting some or all of the Collateral in satisfaction of some or all of the Obligations pursuant to a deed in lieu of foreclosure or otherwise) and in such manner purchase (either directly or through one or more acquisition vehicles) all or any portion of the Collateral (a) at any sale thereof conducted under the provisions of the Bankruptcy Code, including under Sections 363, 1123 or 1129 of the Bankruptcy Code, or any similar laws in any other jurisdictions to which a Loan Party is subject, or (b) at any other sale, foreclosure or acceptance of collateral in lieu of debt conducted by (or with the consent or at the direction of) the Administrative Agent (whether by judicial action or otherwise) in accordance with any applicable law. In connection with any such credit bid and purchase, the Obligations owed to the Secured Parties shall be entitled to be, and shall be, credit bid by the Administrative Agent at the direction of the Required Lenders on a ratable basis (with Obligations with respect to contingent or unliquidated claims receiving contingent interests in the acquired assets on a ratable basis that shall vest upon the liquidation of such claims in an amount proportional to the liquidated portion of the contingent claim amount used in allocating the contingent interests) for the asset or assets so purchased (or for the equity interests or debt instruments of the acquisition vehicle or vehicles that are issued in connection with such purchase). In connection with any such bid (i) the Administrative Agent shall be authorized to form one or more acquisition vehicles and to assign any successful credit bid to such acquisition vehicle or vehicles, (ii) each of the Secured Parties' ratable interests in the Obligations which were credit bid shall be deemed without any further action under this Agreement to be assigned to such vehicle or vehicles for the purpose of closing such sale, (iii) the Administrative Agent shall be authorized to adopt documents providing for the governance of the acquisition vehicle or vehicles (provided that any actions by the Administrative Agent with respect to such acquisition vehicle or vehicles, including any disposition of the assets or equity interests thereof, shall be governed, directly or indirectly, by, and the governing documents shall provide for, control by the vote of the Required Lenders or their permitted

assignees under the terms of this Agreement or the governing documents of the applicable acquisition vehicle or vehicles, as the case may be, irrespective of the termination of this Agreement and without giving effect to the limitations on actions by the Required Lenders contained in this Agreement), (iv) the Administrative Agent on behalf of such acquisition vehicle or vehicles shall be authorized to issue to each of the Secured Parties, ratably on account of the relevant Obligations which were credit bid, interests, whether as equity, partnership interests, limited partnership interests or membership interests, in any such acquisition vehicle and/or debt instruments issued by such acquisition vehicle, all without the need for any Secured Party or acquisition vehicle to take any further action, and (v) to the extent that Obligations that are assigned to an acquisition vehicle are not used to acquire Collateral for any reason (as a result of another bid being higher or better, because the amount of Obligations assigned to the acquisition vehicle exceeds the amount of Obligations credit bid by the acquisition vehicle or otherwise), such Obligations shall automatically be reassigned to the Secured Parties pro rata with their original interest in such Obligations and the equity interests and/or debt instruments issued by any acquisition vehicle on account of such Obligations shall automatically be cancelled, without the need for any Secured Party or any acquisition vehicle to take any further action. Notwithstanding that the ratable portion of the Obligations of each Secured Party are deemed assigned to the acquisition vehicle or vehicles as set forth in clause (ii) above, each Secured Party shall execute such documents and provide such information regarding the Secured Party (and/or any designee of the Secured Party which will receive interests in or debt instruments issued by such acquisition vehicle) as the Administrative Agent may reasonably request in connection with the formation of any acquisition vehicle, the formulation or submission of any credit bid or the consummation of the transactions contemplated by such credit bid.

Section 9.9 Agency for Perfection. Administrative Agent and each Lender hereby appoints each other Lender as agent and bailee for the purpose of perfection the security interests in and liens upon the Collateral in assets which, in accordance with Article 9 of the UCC, can be perfected only by possession or control (or where the security interest of a secured party with possession or control has priority over the security interest of another secured party) and Administrative Agent and each Lender hereby acknowledges that it holds possession of or otherwise controls any such Collateral for the benefit of the Lenders as secured party. Should any Lender obtain possession or control of any such Collateral, such Lender shall notify Administrative Agent thereof, and, promptly upon Administrative Agent's request therefore shall deliver such Collateral to Administrative Agent or in accordance with Administrative Agent's instructions. In addition, Administrative Agent shall also have the power and authority hereunder to appoint such other sub-agents as may be necessary or required under applicable state law or otherwise to perform its duties and enforce its rights with respect to the Collateral and under the Loan Documents. Each Loan Party by its execution and delivery of this Agreement hereby consents to the foregoing.

Section 9.10 Reports and Other Information; Confidentiality; Disclaimers. By becoming a party to this Agreement, each Lender:

(a) is deemed to have requested that Administrative Agent furnish such Lender or Administrative Agent, promptly after it becomes available, a copy of each field audit or examination report with respect to Borrower or its Subsidiaries (each a "Report" and collectively, "Reports") prepared by or at the request of Administrative Agent, and Administrative Agent shall so furnish each Lender with such Reports,

(b) expressly agrees and acknowledges that Administrative Agent does not (i) make any representation or warranty as to the accuracy of any Report, and (ii) shall not be liable for any information contained in any Report,

(c) expressly agrees and acknowledges that the Reports are not comprehensive audits or examinations, that Administrative Agent or other party performing any audit or examination will inspect

only specific information regarding Borrower and its Subsidiaries and will rely significantly upon Borrower's and its Subsidiaries' books and records, as well as on representations of such Person's personnel,

(d) agrees to keep all Reports and other material, non-public information regarding Borrower and its Subsidiaries and their operations, assets, and existing and contemplated business plans in a confidential manner in accordance with Section 10.20, and

(e) without limiting the generality of any other indemnification provision contained in this Agreement, agrees: (i) to hold Administrative Agent and any other Lender preparing a Report harmless from any action the indemnifying Lender may take or fail to take or any conclusion the indemnifying Lender may reach or draw from any Report in connection with any loans or other credit accommodations that the indemnifying Lender has made or may make to Company, or the indemnifying Lender's participation in, or the indemnifying Lender's purchase of, a loan or loans of Company, and (ii) to pay and protect, and indemnify, defend and hold Administrative Agent, and any such other Lender preparing a Report harmless from and against, the claims, actions, proceedings, damages, costs, expenses, and other amounts (including, attorneys' fees and costs) incurred by Administrative Agent and any such other Lender or agent preparing a Report as the direct or indirect result of any third parties who might obtain all or part of any Report through the indemnifying Lender or Administrative Agent.

In addition to the foregoing: (x) any Lender may from time to time request of Administrative Agent in writing that Administrative Agent provide to such Lender a copy of any report or document provided by Borrower or its Subsidiaries to Administrative Agent that has not been contemporaneously provided by Borrower or such Subsidiary to such Lender, and, upon receipt of such request, Administrative Agent promptly shall provide a copy of same to such Lender, (y) to the extent that Administrative Agent is entitled, under any provision of the Loan Documents, to request additional reports or information from Borrower or its Subsidiaries, any Lender may, from time to time, reasonably request Administrative Agent to exercise such right as specified in such Lender's notice to Administrative Agent, whereupon Administrative Agent promptly shall request of Company the additional reports or information reasonably specified by such Lender, and, upon receipt thereof from Company or such Subsidiary, Administrative Agent promptly shall provide a copy of same to such Lender, and (z) any time that Administrative Agent renders to Company a statement regarding the Loan Account, Administrative Agent shall send a copy of such statement to each Lender.

Section 9.11 Protective Advances. Subject to the limitations set forth below, upon the occurrence and during the continuance of an Event of Default, Administrative Agent is authorized by Company and the Lenders, from time to time in Administrative Agent's reasonable discretion (but Administrative Agent shall have absolutely no obligation to), to make disbursements or advances to Company, which Administrative Agent, in its reasonable discretion, deems necessary or desirable (i) to preserve or protect the Collateral, or any portion thereof, (ii) to enhance the likelihood of, or maximize the amount of, repayment of the Loans and other Obligations, or (iii) to pay any other amount chargeable to or required to be paid by Company pursuant to the terms of this Agreement and the other Loan Documents, including, without limitation, payments of principal, interest, fees and reimbursable expenses (in each case a "Protective Advances"). Protective Advances may be made even if the conditions precedent set forth in Article III have not been satisfied. The interest rate on all Protective Advances shall be 15% per annum. Each Protective Advance shall be secured by the Liens in favor of Administrative Agent in and to the Collateral and shall constitute Obligations hereunder. The Protective Advances shall constitute Obligations hereunder which may be charged to the Loan Account in accordance with Section 2.12(i). Company shall pay the unpaid principal amount and all unpaid and accrued interest of each Protective Advance on the earlier of the Term Loan Maturity Date and the date on which demand for payment is made by Administrative Agent. Administrative Agent shall notify each Lender and Company in writing of each

such Protective Advance, which notice shall include a description of the purpose of such Protective Advance. Without limitation to its obligations pursuant to Section 9.6, each Lender agrees that it shall make available to Administrative Agent, upon such Administrative Agent's demand, in Dollars in immediately available funds, the amount equal to such Lender's Pro Rata Share of each such Protective Advance. If such funds are not made available to Administrative Agent by such Lender, Administrative Agent shall be entitled to recover such funds on demand from such Lender, together with interest thereon for each day from the date such payment was due until the date such amount is paid to Administrative Agent, at the Federal Funds Rate for three (3) Business Days and thereafter at the Prime Rate.

Section 9.12 Erroneous Distribution. If all or any part of any payment or other distribution by or on behalf of the Administrative Agent to the Company or any of its Subsidiaries, any Lender, or other Person, on behalf of a Lender, is determined by the Administrative Agent in its sole discretion to have been made in error as determined by the Administrative Agent (any such distribution, an "Erroneous Distribution"), then the Company or the relevant Subsidiary, the relevant Lender or other Person, on behalf of a Lender, shall forthwith on written demand (accompanied by a reasonably detailed calculation of such Erroneous Distribution) repay to the Administrative Agent the amount of such Erroneous Distribution received by such Person. Any determination by the Administrative Agent, in its sole discretion, that all or a portion of any distribution to the Company or any of its Subsidiaries, a Lender or other Person, on behalf of a Lender, was an Erroneous Distribution shall be conclusive absent manifest error. Each of the Company and any of its Subsidiaries, Lender and other potential recipient, on behalf of a Lender, of an Erroneous Distribution hereunder waives any claim of discharge for value and any other claim of entitlement to, or in respect of, any Erroneous Distribution.

ARTICLE X

MISCELLANEOUS

Section 10.1 Notices.

(a) Notices Generally. Unless otherwise specifically provided herein, any notice or other communication herein required or permitted to be given to a Loan Party, Administrative Agent, shall be sent to such Person's address as set forth on Appendix B or in the other relevant Loan Document, and in the case of any Lender, the address as indicated on Appendix B or otherwise indicated to Administrative Agent in writing. Each notice hereunder shall be in writing and may be personally served, telexed or sent by facsimile or United States mail or courier service and shall be deemed to have been given when delivered in person or by courier service and signed for against receipt thereof, upon receipt of facsimile, or three (3) Business Days after depositing it in the United States mail with postage prepaid and properly addressed; provided, no notice to Administrative Agent shall be effective until received by Administrative Agent.

(b) Electronic Communications.

(i) Administrative Agent and Company may, in its discretion, agree to accept notices and other communications to it hereunder by electronic communications pursuant to procedures approved by it; provided that approval of such procedures may be limited to particular notices or communications. Notices and other communications to the Lenders hereunder may be delivered or furnished by electronic communication (including e-mail and Internet or intranet websites) pursuant to procedures approved by Administrative Agent, provided that the foregoing shall not apply to notices to any Lender pursuant to Article II if such Lender has notified Administrative Agent that it is incapable of receiving notices under such Article by electronic communication.

(ii) Unless Administrative Agent otherwise prescribes, (A) notices and other communications sent to an e-mail address shall be deemed received upon the sender's receipt of an acknowledgement from the intended recipient (such as by the "return receipt requested" function, as available, return e-mail or other written acknowledgement), and (B) notices or communications posted to an Internet or intranet website shall be deemed received upon the deemed receipt by the intended recipient, at its e-mail address as described in the foregoing clause (A), of notification that such notice or communication is available and identifying the website address therefor; provided that, for both clauses (A) and (B) above, if such notice, email or other communication is not sent during the normal business hours of the recipient, such notice or communication shall be deemed to have been sent at the opening of business on the next Business Day for the recipient.

Section 10.2 Expenses. Whether or not the transactions contemplated hereby shall be consummated, Company agrees to pay promptly (a) all of Administrative Agent's actual and reasonable out-of-pocket costs and expenses of preparation, negotiation, execution and administration of the Loan Documents and any consents, amendments, waivers or other modifications thereto; (b) all the reasonable fees, expenses and disbursements of counsel to Administrative Agent in connection with the negotiation, preparation, execution and administration of the Loan Documents and any consents, amendments, waivers or other modifications thereto and any other documents or matters requested by Company; (c) all the actual documented costs and reasonable expenses of creating and perfecting Liens in favor of Administrative Agent, for the benefit of Secured Parties, including filing and recording fees, expenses and taxes, stamp or documentary taxes, search fees, title insurance premiums and reasonable fees, expenses and disbursements of counsel to Administrative Agent and of counsel providing any opinions that Administrative Agent or Required Lenders may request in respect of the Collateral or the Liens created pursuant to the Collateral Documents; (d) all of Administrative Agent 's actual documented costs and reasonable fees, expenses for, and disbursements of any of Administrative Agent's auditors, accountants, consultants or appraisers whether internal or external, and all reasonable and documented out-of-pocket attorneys' fees (including expenses and disbursements of outside counsel but excluding allocated costs of internal counsel) incurred by Administrative Agent; (e) all the actual documented costs and reasonable and documented expenses (including the reasonable and documented out-of-pocket fees, expenses and disbursements of any appraisers, consultants, advisors and agents employed or retained by Administrative Agent and its counsel) in connection with the custody or preservation of any of the Collateral; (f) [reserved]; (g) all other actual and reasonable costs and expenses incurred by Administrative Agent in connection with the syndication of the Loans and Commitments and the negotiation, preparation and execution of the Loan Documents and any consents, amendments, waivers or other modifications thereto and the transactions contemplated thereby; and (h) after the occurrence of a Default or an Event of Default, all costs and expenses, including reasonable attorneys' fees (including allocated costs of internal counsel) and costs of settlement, incurred by Administrative Agent and Lenders in enforcing any Obligations of or in collecting any payments due from any Loan Party hereunder or under the other Loan Documents by reason of such Default or Event of Default (including in connection with the sale of, collection from, or other realization upon any of the Collateral or the enforcement of the Guaranty) or in connection with any refinancing or restructuring of the credit arrangements provided hereunder in the nature of a "work out" or pursuant to any insolvency or bankruptcy cases or proceedings.

Section 10.3 Indemnity.

(a) IN ADDITION TO THE PAYMENT OF EXPENSES PURSUANT TO SECTION 10.2, WHETHER OR NOT THE TRANSACTIONS CONTEMPLATED HEREBY SHALL BE CONSUMMATED, EACH LOAN PARTY AGREES TO DEFEND (SUBJECT TO INDEMNITEES' SELECTION OF COUNSEL), INDEMNIFY, PAY AND HOLD HARMLESS, ADMINISTRATIVE AGENT AND LENDER, THEIR AFFILIATES AND THEIR RESPECTIVE OFFICERS, PARTNERS, DIRECTORS, TRUSTEES, EMPLOYEES AND AGENTS OF ADMINISTRATIVE AGENT AND

EACH LENDER (EACH, AN "INDEMNITEE"), FROM AND AGAINST ANY AND ALL INDEMNIFIED LIABILITIES, IN ALL CASES, WHETHER OR NOT CAUSED BY OR ARISING, IN WHOLE OR IN PART, OUT OF THE COMPARATIVE, CONTRIBUTORY, OR SOLE NEGLIGENCE OF SUCH INDEMNITEE; PROVIDED, NO LOAN PARTY SHALL HAVE ANY OBLIGATION TO ANY INDEMNITEE HEREUNDER WITH RESPECT TO ANY INDEMNIFIED LIABILITIES TO THE EXTENT SUCH INDEMNIFIED LIABILITIES ARISE FROM THE GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, AS DETERMINED BY A COURT OF COMPETENT JURISDICTION IN A FINAL, NON-APPEALABLE ORDER, OF THAT INDEMNITEE. TO THE EXTENT THAT THE UNDERTAKINGS TO DEFEND, INDEMNIFY, PAY AND HOLD HARMLESS SET FORTH IN THIS SECTION 10.3 MAY BE UNENFORCEABLE IN WHOLE OR IN PART BECAUSE THEY ARE VIOLATIVE OF ANY LAW OR PUBLIC POLICY, THE APPLICABLE LOAN PARTY SHALL CONTRIBUTE THE MAXIMUM PORTION THAT IT IS PERMITTED TO PAY AND SATISFY UNDER APPLICABLE LAW TO THE PAYMENT AND SATISFACTION OF ALL INDEMNIFIED LIABILITIES INCURRED BY INDEMNITEES OR ANY OF THEM.

(b) To the extent permitted by applicable law, no Loan Party shall assert, and each Loan Party hereby waives, any claim against Lenders, Administrative Agent and their respective Affiliates, directors, employees, attorneys or agents, on any theory of liability, for special, indirect, consequential or punitive damages (as opposed to direct or actual damages) (whether or not the claim therefor is based on contract, tort or duty imposed by any applicable legal requirement) arising out of, in connection with, as a result of, or in any way related to, this Agreement or any Loan Document or any agreement or instrument contemplated hereby or thereby or referred to herein or therein, the transactions contemplated hereby or thereby, any Loan or the use of the proceeds thereof or any act or omission or event occurring in connection therewith, and Company hereby waives, releases and agrees not to sue upon any such claim or any such damages, whether or not accrued and whether or not known or suspected to exist in its favor.

Section 10.4 Set-Off. In addition to any rights now or hereafter granted under applicable law and not by way of limitation of any such rights, upon the occurrence of any Event of Default each Lender, and their respective Affiliates is hereby authorized by each Loan Party at any time or from time to time subject to the consent of Administrative Agent (such consent not to be unreasonably withheld or delayed), without notice to any Loan Party or to any other Person (other than Administrative Agent), any such notice being hereby expressly waived, to set off and to appropriate and to apply any and all deposits (general or special, including Indebtedness evidenced by certificates of deposit, whether matured or unmatured, but not including trust accounts (in whatever currency)) and any other Indebtedness at any time held or owing by such Lender to or for the credit or the account of any Loan Party (in whatever currency) against and on account of the obligations and liabilities of any Loan Party to such Lender hereunder, the participations under the other Loan Documents, including all claims of any nature or description arising out of or connected hereto, or with any other Loan Document, irrespective of whether or not (a) such Lender shall have made any demand hereunder, (b) the principal of or interest on the Term Loans or any other amounts due hereunder shall have become due and payable pursuant to Article II and although such obligations and liabilities, or any of them, may be contingent or unmatured or (c) such obligation or liability is owed to a branch or office of such Lender different from the branch or office holding such deposit or obligation or such Indebtedness.

Section 10.5 Amendments and Waivers.

(a) Required Lenders' Consent. Subject to Section 10.5(b) and 10.5(b)(i), no amendment, modification, termination or waiver of any provision of the Loan Documents, or consent to any departure by any Loan Party therefrom, shall in any event be effective without the written consent of Administrative Agent and the Required Lenders.

(b) Affected Lenders' Consent. Without the written consent of each Lender (other than a Defaulting Lender) that would be affected thereby, no amendment, modification, termination, or consent shall be effective if the effect thereof would:

(i) extend the scheduled final maturity of any Loan or Note;

(ii) waive, reduce or postpone any scheduled repayment (but not prepayment);

(iii) reduce the rate of interest on any Loan (other than any waiver of any increase in the interest rate applicable to any Loan pursuant to Section 2.6) or any fee payable hereunder;

(iv) extend the time for payment of any such interest or fees;

(v) reduce the principal amount of any Loan;

(vi) amend, modify, terminate or waive any provision of this Section 10.5(b) or Section 10.5(b)(i);

(vii) amend the definition of "Required Lenders" or "Pro Rata Share";

(viii) release all or substantially all of the Collateral or all or substantially all of the Guarantors from the Guaranty except as expressly provided in the Loan Documents;

(ix) subordinate (x) any of the Obligations or (y) any Lien created by this Agreement or any other Loan Document, except, in the case of this clause (y), Liens securing Permitted Product Transaction, Permitted Royalty Transaction or other transaction expressly permitted hereunder that is contemplated to have priority over the Liens securing the Obligations; or

(x) consent to the assignment or transfer by any Loan Party of any of its rights and obligations under any Loan Document.

(c) Other Consents. No amendment, modification, termination or waiver of any provision of the Loan Documents, or consent to any departure by any Loan Party therefrom, shall amend, modify, terminate or waive any provision of Article IX as the same applies to Administrative Agent, or any other provision hereof as the same applies to the rights or obligations of Administrative Agent, in each case without the consent of Administrative Agent.

(d) Execution of Amendments, Etc. Administrative Agent may, but shall have no obligation to, with the consent of any Lender, execute amendments, modifications, waivers or consents on behalf of such Lender. Any waiver or consent shall be effective only in the specific instance and for the specific purpose for which it was given. No notice to or demand on any Loan Party in any case shall entitle any Loan Party to any other or further notice or demand in similar or other circumstances. Any amendment, modification, termination, waiver or consent effected in accordance with this Section 10.5 shall be binding upon each Lender at the time outstanding, each future Lender and, if signed by a Loan Party, on such Loan Party.

Section 10.6 Successors and Assigns; Participations.

(a) Generally. This Agreement shall be binding upon the parties hereto and their respective successors and assigns and shall inure to the benefit of the parties hereto and the successors and assigns of Lenders. No Loan Party's rights or obligations hereunder nor any interest therein may be

assigned or delegated by any Loan Party without the prior written consent of all Lenders. Nothing in this Agreement, expressed or implied, shall be construed to confer upon any Person (other than the parties hereto, Indemnitee Agent Parties under Section 9.6, Indemnitees under Section 10.3, their respective successors and assigns permitted hereby and, to the extent expressly contemplated hereby, Affiliates of each of Administrative Agent and Lenders) any legal or equitable right, remedy or claim under or by reason of this Agreement.

(b) Maintenance of the Register. Company, Administrative Agent and Lenders shall, in accordance with the Register provisions of Section 2.3(b), deem and treat the Persons listed as Lenders in the Register as the holders and owners of the corresponding Commitments and Loans listed therein for all purposes hereof, and no assignment or transfer of any such Term Loan Commitment or Loan shall be effective, in each case, unless and until an Assignment Agreement effecting the assignment or transfer thereof shall have been delivered to and accepted by Administrative Agent and recorded in the Register as provided in Section 10.6(e). Prior to such recordation, all amounts owed with respect to the applicable Term Loan Commitment or Loan shall be owed to the Lender listed in the Register as the owner thereof.

(c) Right to Assign. Each Lender shall have the right at any time to sell, assign or transfer all or a portion of its rights and obligations under this Agreement, including, without limitation, all or a portion of its Term Loan Commitment or Loans owing to it or other Obligations (provided, however, that each such assignment shall be of a uniform, and not varying, percentage of all rights and obligations under and in respect of any Loan and any related Commitments; provided, however, that each such assignment of an Initial Term Loan or Delayed Draw Term Loan Commitment shall be accompanied by a pro rata assignment of such Lender's Delayed Draw Term Loan Commitments or Initial Term Loans, respectively):

(i) to any Person meeting the criteria of clause (a) of the definition of the term of "Eligible Assignee" upon the giving of notice to Company and Administrative Agent; and

(ii) to any Person otherwise constituting an Eligible Assignee with the consent of Company (so long as no Default or Event of Default has occurred and is continuing) (provided, that if Company shall not have responded in writing within [**] after receipt of written notice of the proposed assignment, Company shall be deemed to have approved such assignment) and Administrative Agent; provided, each such assignment pursuant to this Section 10.6(c)(ii) shall be in an aggregate amount of not less than $[**] (or such lesser amount as may be agreed to by Company and Administrative Agent).

(d) Mechanics. The assigning Lender and the assignee thereof shall execute and deliver to Administrative Agent an Assignment Agreement, together with such forms or certificates with respect to tax withholding matters as the assignee under such Assignment Agreement may be required to deliver to Administrative Agent pursuant to Section 2.15(d) and all "know your customer" documentation.

(e) Notice of Assignment. Upon its receipt and acceptance of a duly executed and completed Assignment Agreement, any forms or certificates required by this Agreement in connection therewith, Administrative Agent shall record the information contained in such Assignment Agreement in the Register, shall give prompt notice thereof to Company and shall maintain a copy of such Assignment Agreement.

(f) Representations and Warranties of Assignee. Each Lender, upon execution and delivery hereof or upon executing and delivering an Assignment Agreement, as the case may be, represents and warrants as of the Closing Date or as of the applicable Effective Date (as defined in the applicable Assignment Agreement) that (i) it is an Eligible Assignee; (ii) it has experience and expertise in the making of or investing in commitments or loans such as the applicable Term Loan Commitments or Loans, as the

case may be; and (iii) it will make or invest in, as the case may be, its Term Loan Commitments or Loans for its own account in the ordinary course of its business and without a view to distribution of such Term Loan Commitments or Loans within the meaning of the Securities Act or the Exchange Act or other federal securities laws.

(g) Effect of Assignment. Subject to the terms and conditions of this Section 10.6, as of the later (i) of the "Effective Date" specified in the applicable Assignment Agreement or (ii) the date such assignment is recorded in the Register: (A) the assignee thereunder shall have the rights and obligations of a "Lender" hereunder to the extent such rights and obligations hereunder have been assigned to it pursuant to such Assignment Agreement and shall thereafter be a party hereto and a "Lender" for all purposes hereof; (B) the assigning Lender thereunder shall, to the extent that rights and obligations hereunder have been assigned thereby pursuant to such Assignment Agreement, relinquish its rights (other than any rights which survive the termination hereof under Section 10.8) and be released from its obligations hereunder (and, in the case of an Assignment Agreement covering all or the remaining portion of an assigning Lender's rights and obligations hereunder, such Lender shall cease to be a party hereto; provided, anything contained in any of the Loan Documents to the contrary notwithstanding, such assigning Lender shall continue to be entitled to the benefit of all indemnities hereunder as specified herein with respect to matters arising out of the prior involvement of such assigning Lender as a Lender hereunder); (C) the Commitments shall be modified to reflect the Commitment of such assignee and any Commitment of such assigning Lender, if any; and (D) if any such assignment occurs after the issuance of any Note hereunder, the assigning Lender shall, upon the effectiveness of such assignment or as promptly thereafter as practicable, surrender its applicable Notes to Administrative Agent for cancellation, and thereupon Company shall issue and deliver new Notes, if so requested by the assignee and/or assigning Lender, to such assignee and/or to such assigning Lender, with appropriate insertions, to reflect the new Commitments and/or outstanding Loans of the assignee and/or the assigning Lender.

(h) Participations.

(i) Each Lender shall have the right at any time to sell one or more participations to any Person (other than Borrower, any of its Subsidiaries or any of its Affiliates) in all or any part of its Commitments, Loans or in any other Obligation. The holder of any such participation, other than an Affiliate of the Lender granting such participation, shall not be entitled to require such Lender to take or omit to take any action hereunder except with respect to any amendment, modification or waiver that would (i) extend the final scheduled maturity of any Term Loan or Note in which such participant is participating, or reduce the rate or extend the time of payment of interest or fees thereon (except in connection with a waiver of applicability of any post default increase in interest rates) or reduce the principal amount thereof, or increase the amount of the participant's participation over the amount thereof then in effect (it being understood that a waiver of any Default or Event of Default or of a mandatory reduction in the Commitment shall not constitute a change in the terms of such participation, and that an increase in any Term Loan Commitment or Loan shall be permitted without the consent of any participant if the participant's participation is not increased as a result thereof), (ii) consent to the assignment or transfer by any Loan Party of any of its rights and obligations under this Agreement, or (iii) release all or substantially all of the Collateral under the Collateral Documents or all or substantially all of the Guarantors from the Guaranty (in each case, except as expressly provided in the Loan Documents) supporting the Loans hereunder in which such participant is participating. Company agrees that each participant shall be entitled to the benefits of Sections 2.14 and 2.15 (it being understood that the documentation required under Section 2.15(d) shall be delivered to the participating Lender) to the same extent as if it were a Lender and had acquired its interest by assignment pursuant to Section 10.6(c); provided, (A) a participant shall not be entitled to the benefits of Section 2.15 unless, at the time such participant is claiming such benefits, Company is notified of the participation sold to such participant and such participant agrees, for the benefit of Company, to comply with Section 2.15 as though it were a Lender (B) the participant agrees to be subject

to the provisions of Section 2.16 as if it were a Lender; and (C) the participant shall not be entitled to receive any greater payment under Section 2.14 or 2.15, with respect to any participation, than its participating Lender would have been entitled to receive, except to the extent such entitlement to receive a greater payment results from a change in law that occurs after the participant acquired the applicable participation. To the extent permitted by law, each participant also shall be entitled to the benefits of Section 10.4 as though it were a Lender, provided such participant agrees to be subject to Section 2.13 as though it were a Lender.

(ii) In the event that any Lender sells participations in its Commitments, Loans or in any other Obligation hereunder, such Lender shall, acting solely for this purpose as a non-fiduciary agent of Company, maintain a register on which it enters the name and address of all participants in the Commitments, Loans or Obligations held by it and the principal amount (and stated interest thereon) of the portion of such Commitments, Loans or Obligations which are the subject of the participation (the "Participant Register"); provided that no Lender shall have any obligation to disclose all or any portion of the Participant Register (including the identity of any participant or any information relating to a participant's interest in any commitments, loans or its other obligations under any Loan Document) to any Person except to the extent that such disclosure is necessary to establish that such commitment, loan or other obligation is in registered form under Section 5f.103-1(c) of the United States Treasury Regulations. The entries in the Participant Register shall be conclusive absent manifest error, and such Lender shall treat each Person whose name is recorded in the Participant Register as the owner of such participation for all purposes of this Agreement notwithstanding any notice to the contrary. A Commitment, Loan or Obligation hereunder may be participated in whole or in part only by registration of such participation on the Participant Register (and each Note shall expressly so provide). The Participant Register shall be available for inspection by Company at any reasonable time and from time to time upon reasonable prior notice. For the avoidance of doubt, Administrative Agent (in its capacity as administrative agent) shall not have any responsibility for maintaining a Participant Register.

(i) Certain Other Assignments. In addition to any other assignment permitted pursuant to this Section 10.6, any Lender or Administrative Agent may assign, pledge and/or grant a security interest in, all or any portion of its Loans, the other Obligations owed by or to such Lender, and its Notes, if any, to secure obligations of such Lender or Administrative Agent or any of its Affiliates to any Person providing any loan, letter of credit or other extension of credit or financial arrangement to or for the account of such Lender or Administrative Agent or any of its Affiliates and any agent, trustee or representative of such Person (without the consent of, or notice to, or any other action by, any other party hereto), including, without limitation, any Federal Reserve Bank as collateral security pursuant to Regulation A of the Board of Governors of the Federal Reserve System and any operating circular issued by such Federal Reserve Bank; provided, no Lender or Administrative Agent, as between Company and such Lender or Administrative Agent, shall be relieved of any of its obligations hereunder as a result of any such assignment and pledge; provided further, in no event shall such Person, agent, trustee or representative of such Person or the applicable Federal Reserve Bank be considered to be a "Lender" or "Agent" or be entitled to require the assigning Lender or Administrative Agent to take or omit to take any action hereunder.

Section 10.7 Independence of Covenants. All covenants hereunder shall be given independent effect so that if a particular action or condition is not permitted by any of such covenants, the fact that it would be permitted by an exception to, or would otherwise be within the limitations of, another covenant shall not avoid the occurrence of a Default or an Event of Default if such action is taken or condition exists.

Section 10.8 Survival of Representations, Warranties and Agreements. All representations, warranties and agreements made herein shall survive the execution and delivery hereof and the making of any Credit Extension. Notwithstanding anything herein or implied by law to the contrary, the agreements

of each Loan Party set forth in Sections 2.14, 2.15, 10.2, 10.3, 10.4, and 10.10 and the agreements of Lenders set forth in Section 2.13, 9.3(b), 9.6 and 10.20 shall survive the payment of the Term Loans and the termination hereof.

Section 10.9 No Waiver; Remedies Cumulative. No failure or delay on the part of Administrative Agent or any Lender in the exercise of any power, right or privilege hereunder or under any other Loan Document shall impair such power, right or privilege or be construed to be a waiver of any default or acquiescence therein, nor shall any single or partial exercise of any such power, right or privilege preclude other or further exercise thereof or of any other power, right or privilege. The rights, powers and remedies given to Administrative Agent and each Lender hereby are cumulative and shall be in addition to and independent of all rights, powers and remedies existing by virtue of any statute or rule of law or in any of the other Loan Documents. Any forbearance or failure to exercise, and any delay in exercising, any right, power or remedy hereunder shall not impair any such right, power or remedy or be construed to be a waiver thereof, nor shall it preclude the further exercise of any such right, power or remedy.

Section 10.10 Marshalling; Payments Set Aside. Neither Administrative Agent nor any Lender shall be under any obligation to marshal any assets in favor of any Loan Party or any other Person or against or in payment of any or all of the Obligations. To the extent that any Loan Party makes a payment or payments to Administrative Agent or Lenders (or to Administrative Agent, on behalf of Lenders), or Administrative Agent or Lenders enforce any security interests or exercise their rights of setoff, and such payment or payments or the proceeds of such enforcement or setoff or any part thereof are subsequently invalidated, declared to be fraudulent or preferential, set aside and/or required to be repaid to a trustee, receiver or any other party under any bankruptcy law, any other state or federal law, common law or any equitable cause, then, to the extent of such recovery, the obligation or part thereof originally intended to be satisfied, and all Liens, rights and remedies therefor or related thereto, shall be revived and continued in full force and effect as if such payment or payments had not been made or such enforcement or setoff had not occurred.

Section 10.11 Severability. In case any provision in or obligation hereunder or any Note or other Loan Document shall be invalid, illegal or unenforceable in any jurisdiction, the validity, legality and enforceability of the remaining provisions or obligations, or of such provision or obligation in any other jurisdiction, shall not in any way be affected or impaired thereby.

Section 10.12 Obligations Several; Independent Nature of Lenders' Rights. The obligations of Lenders hereunder are several and no Lender shall be responsible for the obligations or Commitment of any other Lender hereunder. Nothing contained herein or in any other Loan Document, and no action taken by Lenders pursuant hereto or thereto, shall be deemed to constitute Lenders as a partnership, an association, a joint venture or any other kind of entity. The amounts payable at any time hereunder to each Lender shall be a separate and independent debt.

Section 10.13 AHYDO.. The Borrower shall pay on the first Interest Payment Date occurring after the fifth anniversary of the date hereof and on each subsequent Interest Payment Date (or, if earlier, before the close of any "accrual period" (as defined in Section 1272(a)(5) of the Code) ending after five (5) years from the date hereof) a portion of the accrued but Unpaid Interest on the Term Loans in an amount sufficient to ensure that the Term Loans will not be "applicable high yield discount obligations" within the meaning of Section 163(i)(1) of the Code (each payment a "Special Mandatory Repayment") and that the Term Loans shall be treated as not having "significant original issue discount" within the meaning of Section 163(i)(2) of the Code, provided that any interest that is paid using the proceeds of a Delayed Draw Term Loan shall not be considered paid for purposes of this Section 10.13. This Section 10.13 shall be interpreted in a manner consistent with the intent that the Loans will not be an "applicable high yield

discount obligation" and will not be treated as not having "significant original issue discount," as such terms are defined above

Section 10.14 Tax Treatment. The parties hereto agree that (a) the Loans are intended to be treated as contingent payment debt instruments within the meaning of Section 1.1275-4 of the Treasury Regulations for U.S. federal income and any other applicable tax purposes; (b) that interest and original interest payable under the Loans is not "contingent interest" within the meaning of Sections 871(h)(4) and 881(c)(4) of the Code and (c) to adhere to this Section 10.14 for U.S. federal income and any other applicable Tax purposes and not to take any action or file any Tax return, report or declaration inconsistent herewith unless otherwise required by applicable law. The Borrower shall not determine the comparable yield or the projected payment schedule (as defined in Section 1.1275-4 of the Treasury Regulations) of the Loans without the consent of the Lenders (not to be unreasonably conditioned, withheld or delayed). The inclusion of this Section 10.14 is not an admission by any Lender that it is subject to United States taxation.

Section 10.15 Original Issue Discount. For purposes of Sections 1272, 1273 and 1275 of the Internal Revenue Code, each Term Loan is being issued with original issue discount; please contact the chief financial officer of the Borrower to obtain information regarding the issue price, the amount of original issue discount and the yield to maturity.

Section 10.16 Headings. Section headings herein are included herein for convenience of reference only and shall not constitute a part hereof for any other purpose or be given any substantive effect.

Section 10.17 APPLICABLE LAW. THIS AGREEMENT (INCLUDING SECTION 10.17) AND THE RIGHTS AND OBLIGATIONS OF THE PARTIES HEREUNDER SHALL BE GOVERNED BY, AND SHALL BE CONSTRUED AND ENFORCED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK APPLICABLE TO CONTRACTS MADE AND TO BE PERFORMED IN THE STATE OF NEW YORK.

Section 10.18 CONSENT TO JURISDICTION.

(a) ALL JUDICIAL PROCEEDINGS BROUGHT AGAINST ANY LOAN PARTY ARISING OUT OF OR RELATING HERETO OR ANY OTHER LOAN DOCUMENT, OR ANY OF THE OBLIGATIONS, MAY BE BROUGHT IN ANY STATE OR FEDERAL COURT OF COMPETENT JURISDICTION IN THE STATE, COUNTY AND CITY OF NEW YORK. BY EXECUTING AND DELIVERING THIS AGREEMENT, EACH LOAN PARTY, FOR ITSELF AND IN CONNECTION WITH ITS PROPERTIES, IRREVOCABLY (I) ACCEPTS GENERALLY AND UNCONDITIONALLY THE NON-EXCLUSIVE JURISDICTION AND VENUE OF SUCH COURTS; (II) WAIVES ANY DEFENSE OF FORUM NON CONVENIENS; (III) AGREES THAT SERVICE OF ALL PROCESS IN ANY SUCH PROCEEDING IN ANY SUCH COURT MAY BE MADE BY REGISTERED OR CERTIFIED MAIL, RETURN RECEIPT REQUESTED, TO THE APPLICABLE LOAN PARTY AT ITS ADDRESS PROVIDED IN ACCORDANCE WITH SECTION 10.1 OR TO ANY PROCESS AGENT SELECTED FOR SUCH LOAN PARTY IN ACCORDANCE WITH SECTION 3.1(U) IS SUFFICIENT TO CONFER PERSONAL JURISDICTION OVER THE APPLICABLE LOAN PARTY IN ANY SUCH PROCEEDING IN ANY SUCH COURT, AND OTHERWISE CONSTITUTES EFFECTIVE AND BINDING SERVICE IN EVERY RESPECT; AND (iv) AGREES THAT ADMINSTRATIVE AGENT AND LENDERS RETAIN THE RIGHT TO SERVE PROCESS IN ANY OTHER MANNER PERMITTED BY LAW OR TO BRING PROCEEDINGS AGAINST ANY LOAN PARTY IN THE COURTS OF ANY OTHER JURISDICTION.

Section 10.19 WAIVER OF JURY TRIAL. EACH OF THE PARTIES HERETO HEREBY AGREES TO WAIVE ITS RESPECTIVE RIGHTS TO A JURY TRIAL OF ANY CLAIM OR CAUSE

OF ACTION BASED UPON OR ARISING HEREUNDER OR UNDER ANY OF THE OTHER LOAN DOCUMENTS OR ANY DEALINGS BETWEEN THEM RELATING TO THE SUBJECT MATTER OF THIS LOAN TRANSACTION OR THE LENDER/BORROWER RELATIONSHIP THAT IS BEING ESTABLISHED. THE SCOPE OF THIS WAIVER IS INTENDED TO BE ALL ENCOMPASSING OF ANY AND ALL DISPUTES THAT MAY BE FILED IN ANY COURT AND THAT RELATE TO THE SUBJECT MATTER OF THIS TRANSACTION, INCLUDING CONTRACT CLAIMS, TORT CLAIMS, BREACH OF DUTY CLAIMS AND ALL OTHER COMMON LAW AND STATUTORY CLAIMS. EACH PARTY HERETO ACKNOWLEDGES THAT THIS WAIVER IS A MATERIAL INDUCEMENT TO ENTER INTO A BUSINESS RELATIONSHIP, THAT EACH HAS ALREADY RELIED ON THIS WAIVER IN ENTERING INTO THIS AGREEMENT, AND THAT EACH WILL CONTINUE TO RELY ON THIS WAIVER IN ITS RELATED FUTURE DEALINGS. EACH PARTY HERETO FURTHER WARRANTS AND REPRESENTS THAT IT HAS REVIEWED THIS WAIVER WITH ITS LEGAL COUNSEL AND THAT IT KNOWINGLY AND VOLUNTARILY WAIVES ITS JURY TRIAL RIGHTS FOLLOWING CONSULTATION WITH LEGAL COUNSEL. THIS WAIVER IS IRREVOCABLE, MEANING THAT IT MAY NOT BE MODIFIED EITHER ORALLY OR IN WRITING (OTHER THAN BY A MUTUAL WRITTEN WAIVER SPECIFICALLY REFERRING TO THIS SECTION 10.19 AND EXECUTED BY EACH OF THE PARTIES HERETO), AND THIS WAIVER SHALL APPLY TO ANY SUBSEQUENT AMENDMENTS, RENEWALS, SUPPLEMENTS OR MODIFICATIONS HERETO OR ANY OF THE OTHER LOAN DOCUMENTS OR TO ANY OTHER DOCUMENTS OR AGREEMENTS RELATING TO THE LOANS MADE HEREUNDER. IN THE EVENT OF LITIGATION, THIS AGREEMENT MAY BE FILED AS A WRITTEN CONSENT TO A TRIAL BY THE COURT.

Section 10.20 Confidentiality. Administrative Agent and Lender (each, a "Recipient") shall hold all non-public, proprietary or confidential information regarding Company and its Subsidiaries and their businesses, in visual, written, electronic or other tangibles form, whether or not marked or designated as "confidential" and obtained by such Lender from (or on behalf of) Company or its Subsidiaries and all materials prepared by Recipient or any of their Affiliates that contain or are substantially based on any of the foregoing (collectively, "Confidential Information") confidential and will use such information solely for purposes of this Agreement and related transactions contemplated hereunder, it being understood and agreed by Company that (a) Confidential Information shall not include information that (i) is or becomes generally available to the public other than as a result of Recipient's act or omission in breach of the terms hereof; (ii) is obtained by Recipient on a non-confidential basis from a third party that was not, to the knowledge of the Administrative Agent or such Lender, as applicable, legally or contractually restricted from disclosing such information by an obligation owed to the Company and its Subsidiaries; (iii) was in Recipient's possession prior to disclosure by (or on behalf of) the Company and its Subsidiaries; or (iv) was or is independently developed by Recipient and (b) in any event, Administrative Agent or Lender may make (i) disclosures of such information to Affiliates of Administrative Agent or Lender and to their respective employees, officers, directors, partners, limited partners, current and prospective investors, managed funds, managed accounts, managers, members, agents, servicers, consultants, attorneys, accountants and advisors (and to other persons authorized by a Lender or Administrative Agent to organize, present or disseminate such information in connection with disclosures otherwise made in accordance with this Section 10.20), (ii) disclosures of such information reasonably required by any bona fide or potential assignee, transferee or participant in connection with the contemplated assignment, transfer or participation by any such Lender of any Loans or any participations therein; provided that, prior to any disclosure such assignee, transferee or participant is informed of the confidential nature of the information and instructed to keep such Confidential Information confidential, (iii) [reserved], (iv) disclosure to any Lender's financing sources; provided that, prior to any disclosure such financing source is informed of the confidential nature of the information and instructed to keep such Confidential Information confidential, (v) disclosures of such information to any actual or potential investors, members and partners of Administrative Agent, any Lender or their Affiliates; provided that prior to any disclosure, such investor or partner is informed of the confidential nature of the information and instructed to keep such Confidential

Information confidential and (v) disclosure required or requested in connection with any public filings, whether pursuant to any securities laws or regulations or rules promulgated therefor (including the Investment Company Act of 1940 or otherwise) or representative thereof or by the National Association of Insurance Commissioners (and any successor thereto) or pursuant to legal or judicial process; provided, unless specifically prohibited by applicable law or court order, Administrative Agent and Lender shall make reasonable efforts to notify Company of any request by any Governmental Authority or representative thereof (other than any such request in connection with any examination of the financial condition or other routine examination of such Lender by such Governmental Authority) for disclosure of any such non-public information prior to disclosure of such information. Notwithstanding anything to the contrary set forth herein, each party (and each of their respective employees, representatives or other agents) may disclose to any and all persons, without limitations of any kind, the tax treatment and tax structure of the transactions contemplated by this Agreement and all materials of any kind (including opinions and other tax analyses) that are provided to any such party relating to such tax treatment and tax structure. However, any information relating to the tax treatment or tax structure shall remain subject to the confidentiality provisions hereof (and the foregoing sentence shall not apply) to the extent reasonably necessary to enable the parties hereto, their respective Affiliates, and their and their respective Affiliates' directors and employees to comply with applicable securities laws. For this purpose, "tax structure" means any facts relevant to the federal income tax treatment of the transactions contemplated by this Agreement but does not include information relating to the identity of any of the parties hereto or any of their respective Affiliates. Notwithstanding the foregoing, on or after the Closing Date, Administrative Agent and any Lender may, at its own expense, issue news releases and publish "tombstone" advertisements and other announcements relating to this transaction in newspapers, trade journals and other appropriate media (which may include use of logos of one or more of the Loan Parties) (collectively, "Trade Announcements"). No Loan Party shall (i) issue any Trade Announcement or (ii) disclose the name of any Administrative Agent or any Lender, except (A) disclosures required by applicable law, regulation, legal process or the rules of the Securities and Exchange Commission, (B) on a confidential basis to the Company's controlled Affiliates and Subsidiaries and the Company's and their controlled Affiliates' and Subsidiaries' Board of Directors (or equivalent governing body), employees, representatives and professional advisors, subject, in the case of this clause (B), to such person being subject to customary confidentiality obligations with respect to this Agreement, (C) to the extent such information becomes publicly available other than by reason of improper disclosure in violation of the confidentiality obligations set forth in this Section 10.20, (E) to a Tax authority, to the extent reasonably necessary in connection with the Tax affairs of the Company and/or any of its Affiliates or (C) with the prior approval of the Administrative Agent and such Lender.

Section 10.21 Usury Savings Clause. Notwithstanding any other provision herein, the aggregate interest rate charged or agreed to be paid with respect to any of the Obligations, including all charges or fees in connection therewith deemed in the nature of interest under applicable law shall not exceed the Highest Lawful Rate. If the rate of interest (determined without regard to the preceding sentence) under this Agreement at any time exceeds the Highest Lawful Rate, the outstanding amount of the Loans made hereunder shall bear interest at the Highest Lawful Rate until the total amount of interest due hereunder equals the amount of interest which would have been due hereunder if the stated rates of interest set forth in this Agreement had at all times been in effect. In addition, if when the Loans made hereunder are repaid in full the total interest due hereunder (taking into account the increase provided for above) is less than the total amount of interest which would have been due hereunder if the stated rates of interest set forth in this Agreement had at all times been in effect, then to the extent permitted by law, Company shall pay to Administrative Agent an amount equal to the difference between the amount of interest paid and the amount of interest which would have been paid if the Highest Lawful Rate had at all times been in effect. Notwithstanding the foregoing, it is the intention of Lenders and Company to conform strictly to any applicable usury laws. Accordingly, if any Lender contracts for, charges, or receives any consideration which constitutes interest in excess of the Highest Lawful Rate, then any such excess shall be cancelled automatically and, if previously paid, shall at such Lender's option be applied to the outstanding amount of

the Loans made hereunder or be refunded to Company. In determining whether the interest contracted for, charged, or received by Administrative Agent or a Lender exceeds the Highest Lawful Rate, such Person may, to the extent permitted by applicable law, (a) characterize any payment that is not principal as an expense, fee, or premium rather than interest, (b) exclude voluntary prepayments and the effects thereof, and (c) amortize, prorate, allocate, and spread in equal or unequal parts the total amount of interest, throughout the contemplated term of the Obligations hereunder.

Section 10.22 Counterparts. This Agreement may be executed in any number of counterparts, each of which when so executed and delivered shall be deemed an original, but all such counterparts together shall constitute but one and the same instrument. This Agreement shall become effective upon the execution of a counterpart hereof by each of the parties hereto. Delivery of an executed counterpart of a signature page of this Agreement by facsimile or other electronic imaging means shall be effective as delivery of a manually executed counterpart of this Agreement. The words "execution," "execute", "signed," "signature," and words of like import in or related to any document to be signed in connection with this Agreement and the other Loan Documents and the transactions contemplated hereby and thereby (including without limitation Assignment Agreement, amendments, Notices, waivers and consents) shall be deemed to include electronic signatures, the electronic matching of assignment terms and contract formations on electronic platforms approved by Administrative Agent, or the keeping of records in electronic form, each of which shall be of the same legal effect, validity or enforceability as a manually executed signature or the use of a paper-based recordkeeping system, as the case may be, to the extent and as provided for in any applicable law, including the Federal Electronic Signatures in Global and National Commerce Act, the New York State Electronic Signatures and Records Act, or any other similar state laws based on the Uniform Electronic Transactions Act.

Section 10.23 Effectiveness. This Agreement shall become effective upon the execution of a counterpart hereof by each of the parties hereto and receipt by Company and Administrative Agent of written notification of such execution and authorization of delivery thereof.

Section 10.24 PATRIOT Act Notice. Each Lender and Administrative Agent (for itself and not on behalf of any Lender) hereby notifies the Loan Parties that pursuant to the requirements of the PATRIOT Act, it may be required to obtain, verify and record information that identifies each Loan Party, which information includes the name and address of the Loan Parties and other information that will allow such Lender or Administrative Agent, as applicable, to identify the Loan Parties in accordance with the PATRIOT Act or other Anti-Terrorism Laws of the Loan Parties and other information that will allow such Lender or Administrative Agent, as applicable, to identify the Loan Parties in connection with the PATRIOT Act.

Section 10.25 Waiver of Immunity. To the extent that any Loan Party has or hereafter may acquire (or may be attributed, whether or not claimed) any immunity (sovereign or otherwise) from any legal action, suit or proceeding, from jurisdiction of any court or from set-off or any legal process (whether service of process or notice, attachment prior to judgment, attachment in aid of execution of judgment, execution of judgment or otherwise) with respect to itself or any of its property, such Loan Party hereby irrevocably waives and agrees not to plead or claim, to the fullest extent permitted by law, such immunity in respect of (a) its obligations under the Loan Documents, (b) any legal proceedings to enforce such obligations and (c) any legal proceedings to enforce any judgment rendered in any proceedings to enforce such obligations. Each Loan Party hereby agrees that the waivers set forth in this Section 10.25 shall be to the fullest extent permitted under the Foreign Sovereign Immunities Act and are intended to be irrevocable for purposes of the Foreign Sovereign Immunities Act.

[Remainder of page intentionally left blank]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be duly executed and delivered by their respective officers thereunto duly authorized as of the date first written above.

BORROWER:

ARROWHEAD PHARMACEUTICALS, INC.

By: /s/ Kenneth A. Myszkowski
Name: Kenneth A. Myszkowski
Title: Chief Financial Officer

GUARANTOR SUBSIDIARIES:

ARROWHEAD MADISON INC.

By: /s/ Kenneth A. Myszkowski
Name: Kenneth A. Myszkowski
Title: Chief Financial Officer

SIXTH STREET LENDING PARTNERS,
as Administrative Agent

By: /s/ Robert (Bo) Stanley
Name: Robert (Bo) Stanley
Title: Vice President

SSLP LENDING, LLC,
as Lender

By: /s/ Robert (Bo) Stanley
Name: Robert (Bo) Stanley
Title: President

TDL LENDING, LLC, SERIES 33,
as Lender

By: /s/ Robert (Bo) Stanley
Name: Robert (Bo) Stanley
Title: Vice President

OPPS V LENDING, LLC, SERIES 3,
as Lender

By: /s/ Robert (Bo) Stanley
Name: Robert (Bo) Stanley
Title: Vice President

TC LENDING, LLC
as Lender

By: /s/ Robert (Bo) Stanley
Name: Robert (Bo) Stanley
Title: President

APPENDIX A-1
TO FINANCING AGREEMENT

Initial Term Loan Commitment

Lender	Initial Term Loan Commitment
SSLP Lending, LLC	$[**]
TDL Lending, LLC, Series 33	$[**]
Opps V Lending, LLC, Series 3	$[**]
TC Lending, LLC	$[**]
Total	$400,000,000.00

APPENDIX A-2
TO FINANCING AGREEMENT

Delayed Draw Term Loan Commitments

Lender	Delayed Draw Term Loan Commitment
SSLP Lending, LLC	$[**]
TDL Lending, LLC, Series 33	$[**]
Opps V Lending, LLC, Series 3	$[**]
TC Lending, LLC	$[**]
Total	$435,261,000.00

APPENDIX B
TO FINANCING AGREEMENT

Notice Addresses

ARROWHEAD PHARMACEUTICALS, INC.
177 East Colorado Boulevard, Suite 700
Pasadena, CA 91105
Attention: General Counsel
Email: [**]

with a copy (which shall not constitute notice) to:

Gibson Dunn & Crutcher LLP
200 Park Avenue
New York, NY 10166
Attention: Ryan Murr and Jin Hee Kim
Email: RMurr@gibsondunn.com and JhKim@gibsondunn.com

SSLP Lending, LLC; TDL Lending, LLC Series 33;
Opps V Lending, LLC, Series 3; TC Lending, LLC,
each as a Lender,

2100 McKinney Avenue, Suite 1500
Dallas, Texas 75201
Attention: TSLX Accounting
Email: [**]

with a copy (which shall not constitute notice) to:

Sixth Street Specialty Lending, Inc.
888 7th Avenue
35th Floor
New York, New York 10019
Attention: [**]
Email: [**]

Sixth Street Lending Partners,
as Administrative Agent and a Lender

Administrative Agent's Principal Office:

2100 McKinney Avenue, Suite 1500
Dallas, Texas 75201
Attention: TSLX Accounting
Email: [**]

with a copy (which shall not constitute notice) to:

Sixth Street Lending Partners
2100 McKinney Avenue, Suite 1500
Dallas, Texas 75201
Attention: [**]
Email: [**]

and

Attention: [**]
Email: [**]

in each case, with a copy (which shall not constitute notice) to:

Proskauer Rose LLP
Eleven Times Square
New York, New York 10036
Attention: Frederic L. Ragucci, Esq.
Email: fragucci@proskauer.com

Mintz, Levin, Cohn, Ferris, Glovsky & Popeo, PC
919 Third Avenue
New York, New York 10022
Attention: Richard G. Gervase, Esq.
Email: rgervase@mintz.com

Execution Version

CERTAIN INFORMATION IN THIS DOCUMENT, MARKED BY [**], HAS BEEN EXCLUDED PURSUANT TO REGULATION S-K, ITEM 601(b)(10)(iv). SUCH EXCLUDED INFORMATION IS NOT MATERIAL AND IS THE TYPE THAT THE REGISTRANT TREATS AS PRIVATE OR CONFIDENTIAL.

SIXTH STREET LENDING PARTNERS
2100 McKinney Avenue, Suite 1500
Dallas, Texas 75201

PERSONAL AND CONFIDENTIAL

August 7, 2024

Arrowhead Pharmaceuticals, Inc.
117 East Colorado Boulevard, Suite 700
Pasadena, CA 91105
Attention: Mr. Vince Anzalone, VP and Head of Investor Relations, Arrowhead Pharmaceuticals
Dr. Christopher Anzalone, CEO, Arrowhead Pharmaceuticals
Mr. Ken Myszkowski, CFO, Arrowhead Pharmaceuticals

Fee Letter

Dear Ladies and Gentlemen:

Reference is hereby made to the Financing Agreement, dated as of the date hereof (as amended, restated, replaced, supplemented or otherwise modified from time to time, the "Financing Agreement"; terms not otherwise defined herein shall have the meaning set forth in the Financing Agreement) by and among ARROWHEAD PHARMACEUTICALS, INC., a Delaware corporation ("Borrower"), certain Subsidiaries of Borrower, as Guarantors, the lenders from time to time party thereto (the "Lenders"), SIXTH STREET LENDING PARTNERS ("Sixth Street"), as administrative agent for the Lenders (in such capacity, "Administrative Agent").

Borrower and Administrative Agent hereby agree to the following:

1. Borrower agrees to pay to Administrative Agent, solely for its own account, an administration fee (the "Administration Fee") in an amount equal to $[**] each quarter , payable quarterly in advance on the Closing Date (for the period from the Closing Date through September 30, 2024), and on the first Business Day of each October, January, April and July thereafter, until payment in full of the Obligations under the Financing Agreement, or otherwise as agreed by Borrower and Administrative Agent.

2. As consideration for the services, agreements and undertakings of each Lender that is TC Lending, LLC, SSLP Lending, LLC, Opps V Lending, LLC, Series 3 and TDL Lending, LLC, Series 33 (each, a "Sixth Street Lender" and collectively, the "Sixth Street Lenders") under the Financing Agreement, Borrower agrees to pay (or cause to be paid) to Administrative Agent, for the account of each Sixth Street Lender, on the Closing Date, a fee equal to [**]% of the aggregate principal amount of Initial Term Loans of each such Sixth Street Lender that is actually funded under the Financing Agreement on the Closing Date (the "Arrangement

Fee"). The Arrangement Fee shall be fully earned and shall be paid (and once paid shall be non-refundable) on the Closing Date. For the avoidance of doubt, the Arrangement Fee may, in each Sixth Street Lender's sole discretion, be netted out of the proceeds of the Initial Term Loans funded on the Closing Date by such Sixth Street Lender.

3. Borrower agrees to pay (or cause to be paid) to Administrative Agent, for the account of each Sixth Street Lender, on the Closing Date, an upfront fee in an amount equal to [**]% of the aggregate principal amount of the Initial Term Loans funded on the Closing Date by each such Sixth Street Lender (the "Sixth Street Upfront Fee"), which is fully earned and due and payable to Administrative Agent, for the account of each such Sixth Street Lender, on the Closing Date. For the avoidance of doubt, the Sixth Street Upfront Fee may, in each Sixth Street Lender's sole discretion, be netted out of the proceeds of the Initial Term Loans funded on the Closing Date by such Sixth Street Lender. The Sixth Street Upfront Fee is intended to be treated as original issue discount for U.S. federal income tax purposes.

4. If, on or prior to August 7, 2029, the Lenders have not earned and been paid an aggregate minimum multiple of invested capital as calculated below ("MOIC") of at least 1.00 times the aggregate principal amount of the Initial Term Loans made on the Closing Date (the "1.0x MOIC"), Borrower shall prepay the Term Loan as set forth in Section 2.11(a) of the Financing Agreement, within one (1) Business Days after such date, with a one-time payment (such payment, the "True Up Payment") equal to the amount necessary for the Lenders to achieve the 1.0x MOIC. The Administrative Agent shall provide the Borrower with an estimate, together with a supporting calculation, of the amount of the True Up Payment as of July 8, 2029. The amount so earned and paid shall mean, as of any date of determination, all fees, interest (including the amount of proceeds of Delayed Draw Term Loans funded to finance such interest payments), premiums and principal made to the Lenders in respect of the Initial Term Loan since the Closing Date up to and including amounts paid on such date of determination (including, unless expressly stated otherwise, the True Up Payment but excluding other amounts payable under the Loan Documents, including without limitation, the Administration Fee, indemnification obligations. reimbursement obligations for expenses and reimbursements obligations for other amounts paid or payable by the Administrative Agent or Lenders under the Financing Agreement). The True Up Payment shall be paid to the Administrative Agent for the account of the Lenders based on their pro rata share of the Initial Term Loans.

5. If, prior to the Term Loan Maturity Date, Borrower pays (or is deemed to pay in the case of an acceleration of the Term Loans), for any reason (including, but not limited to, any optional or mandatory payment, but excluding any True Up Payment and any mandatory payment made pursuant to Sections 2.10(e), (f), (g), (h), (i) and (j) of the Financing Agreement) solely after the occurrence of an Event of Default or after acceleration of the Term Loans in connection with an Event of Default (including in connection with the commencement of any Insolvency Proceeding or other proceeding pursuant to any Debtor Relief Laws), all or any part of the principal balance of any Term Loan, Borrower shall pay to Administrative Agent, for the ratable benefit of all Lenders entitled to a portion of such prepayment, an amount (the "E of D Yield Maintenance Premium") in cash equal to the present value, as of the date of the applicable payment or acceleration (the "E of D Calculation Date"), of all interest payments (including, without limitation, interest payable in cash, in kind or deferred) which would have otherwise been

payable on the amount of the principal prepaid or accelerated from the date of prepayment (or deemed prepayment in the case of an acceleration) (determined using a rate of interest per annum equal to the rate of interest in effect pursuant to the terms of the Financing Agreement as of the date of such prepayment or acceleration) (the "E of D Subject Amount") until the Term Loan Maturity Date (excluding interest on the E of D Subject Amount through the E of D Calculation Date, to the extent paid in cash on the E of D Calculation Date) discounted at the Treasury Rate plus 0.50% as of the E of D Calculation Date. Notwithstanding the foregoing, to the extent the E of D Yield Maintenance Premium becomes due and payable as a result of the occurrence of an Event of Default or acceleration of the Loans in connection with an Event of Default (including in connection with the commencement of any Insolvency Proceeding or other proceeding pursuant to any Debtor Relief Laws), the interest rate to be used in calculating the Yield Maintenance Premium shall be the interest rate applicable to the Term Loans plus [**]% per annum for the period from the occurrence of such Event of Default or acceleration (including in connection with the commencement of any Insolvency Proceeding or other proceeding pursuant to any Debtor Relief Laws) until the Term Loan Maturity Date. The term "Treasury Rate" shall mean, as of any date of determination, a rate per annum (computed on the basis of actual days elapsed over a year of 360 days) equal to the rate determined by the Administrative Agent on the date three (3) Business Days prior to the date of prepayment, to be the yield expressed as a rate listed in The Wall Street Journal (or, if such rate is not available in The Wall Street Journal, such other recognized data source as selected by the Administrative Agent in its sole discretion) for United States Treasury securities having a term of no greater than the period for the remaining months until the Term Loan Maturity Date. Nothing contained in this Section 5 shall permit any voluntary prepayment not otherwise permitted by the terms of the Financing Agreement.

6. If at any time (including on the Maturity Date), Borrower pays the Term Loan and all other payment Obligations (including any applicable E of D Yield Maintenance Premium but excluding any contingent obligations that are not required to be paid by the Borrower under the Financing Agreement) under the Financing Agreement in full, solely in the absence of the occurrence of an Event of Default or in the absence of an acceleration of the Term Loan in connection with an Event of Default (including in connection with the commencement of any Insolvency Proceeding or other proceeding pursuant to any other Debtor Relief Laws) (a) if such payment in full occurs from the Closing Date through and including August 7, 2028, and the Lenders have not earned and been paid (as calculated above and including the True Up Payment) a MOIC of at least 2.00 times the principal amount of the Initial Term Loan made on the Closing Date (the "2.0x MOIC") on the date of such payment in full, Borrower shall pay to the Lenders on the date of such payment in full the amount necessary for Lenders to achieve the 2.0x MOIC after giving effect to all payments made on such date of payment and (b) if such payment in full occurs after August 7, 2028, Borrower shall pay to the Lenders on the date of such payment in full an amount equal to the greater of (x) the amount necessary for the Lenders to achieve the 2.0x MOIC on the date of such payment in full after giving effect to all payments made on such date of payment and (y) an amount (the "Non-E of D Yield Maintenance Premium" and, together with the E of D Yield Maintenance Premium, the "Yield Maintenance Premium") in cash equal to the present value, as of the date of the applicable payment (the "Non-E of D Calculation Date"), of all interest payments (including, without limitation, interest payable in cash, in kind or deferred) which would have otherwise been payable on the amount of the principal prepaid or repaid from the Non-E of D Calculation Date (determined using a rate of interest per annum equal to the rate

of interest in effect pursuant to the terms of the Financing Agreement as of the date of such prepayment) (the "Non-E of D Subject Amount") until the Term Loan Maturity Date (excluding interest on the Non-E of D Subject Amount through the Non-E of D Calculation Date, to the extent paid in cash on the Non-E of D Calculation Date) discounted at the Treasury Rate plus 0.50% as of the Non-E of D Calculation Date.

7. Without limiting the generality of the foregoing, it is understood and agreed that if the Obligations are accelerated for any reason, including because of default, the commencement of any Insolvency Proceeding or other proceeding pursuant to any Debtor Relief Laws, sale, disposition or encumbrance (including that by operation of law or otherwise), the E of D Yield Maintenance Premium, if any, determined as of the date of acceleration will also be due and payable as though said Indebtedness was voluntarily prepaid as of such date and shall constitute part of the Obligations, in view of the impracticability and extreme difficulty of ascertaining actual damages and by mutual agreement of the parties as to a reasonable calculation of each Lender's lost profits as a result thereof. Any E of D Yield Maintenance Premium payable in accordance with the immediately preceding sentence shall be presumed to be the liquidated damages sustained by each Lender as the result of the early termination and Borrower agrees that it is reasonable under the circumstances currently existing. The E of D Yield Maintenance Premium, if any, shall also be payable (i) in the event the Obligations (and/or the Financing Agreement or the Notes evidencing the Obligations) are satisfied or released by foreclosure (whether by power of judicial proceeding or otherwise), deed in lieu of foreclosure or by any other means and/or (ii) upon the satisfaction, release, payment, restructuring, reorganization, replacement, reinstatement, defeasance or compromise of any of the Obligations (and/or the Financing Agreement or the Notes evidencing the Obligations) in any Insolvency Proceeding or other proceeding pursuant to any Debtor Relief Laws, foreclosure (whether by power of judicial proceeding or otherwise), deed in lieu of foreclosure or by any other means or the making of a distribution of any kind in any Insolvency Proceeding or other proceeding pursuant to any Debtor Relief Laws to the Administrative Agent, for the account of the Lenders, in full or partial satisfaction of the Obligations. BORROWER EXPRESSLY WAIVES THE PROVISIONS OF ANY PRESENT OR FUTURE STATUTE OR LAW THAT PROHIBITS OR MAY PROHIBIT THE COLLECTION OF THE FOREGOING E of D YIELD MAINTENANCE PREMIUM IN CONNECTION WITH ANY SUCH ACCELERATION INCLUDING IN CONNECTION WITH ANY VOLUNTARY OR INVOLUNTARY ACCELERATION OF THE OBLIGATIONS PURSUANT TO ANY INSOLVENCY PROCEEDING OR OTHER PROCEEDING PURSUANT TO ANY DEBTOR RELIEF LAWS OR PURSUANT TO A PLAN OF REORGANIZATION. Borrower expressly agrees that: (A) the E of D Yield Maintenance Premium is reasonable and is the product of an arm's length transaction between sophisticated business people, ably represented by counsel; (B) the E of D Yield Maintenance Premium shall be payable notwithstanding the then prevailing market rates at the time payment is made; (C) there has been a course of conduct between Lenders and Borrower giving specific consideration in this transaction for such agreement to pay the E of D Yield Maintenance Premium; and (D) Borrower shall be estopped hereafter from claiming differently than as agreed to in this paragraph. Borrower expressly acknowledges that its agreement to pay the E of D Yield Maintenance Premium to Lenders as herein described is a material inducement to Lenders to provide the Commitments and make the Term Loans and other extensions of credit.

8. Borrower further acknowledges and agrees that no fees will be paid to any other Lender in connection with the Financing Agreement and the other Loan Documents except as may be agreed in writing by Sixth Street. All fees payable hereunder shall be fully earned when due and non-refundable when paid and shall be in addition to any other fees, costs and expenses payable pursuant to the Financing Agreement or the other Loan Documents. Sixth Street reserves the right to allocate, in whole or in part, to any of its affiliates certain fees payable to Sixth Street hereunder in such manner as Sixth Street and such affiliates shall agree in their sole discretion.

9. To the extent permitted by applicable law, Borrower's obligation to pay the foregoing fees will not be subject to counterclaim or setoff for, or be otherwise affected by, any claim or dispute Borrower may have. In addition, all such payments shall be made without deduction for any taxes, levies, imposts, duties, deductions, charges or withholdings imposed by any national, state or local taxing authority ("Taxes") unless otherwise required by applicable law, and, if Borrower is required by applicable law to deduct or withhold such Taxes, such payments will be grossed up by Borrower for such amounts to the extent provided in the Financing Agreement (as if the payments had been made pursuant to the Financing Agreement).

10. Please note that this Fee Letter is exclusively for the information of the senior management of Borrower and may not be disclosed to any third party other than to Borrower's officers, directors, agents and advisors who are directly involved in the negotiation of the Loan Documents to the extent such persons agree to hold the same in confidence or circulated or referred to publicly, except to the extent expressly set forth in the Financing Agreement.

11. This Fee Letter shall be governed by and construed in accordance with the laws of the State of New York without regard to principles of conflicts of law. If this Fee Letter becomes the subject of a dispute, each of the parties hereto hereby waives trial by jury. Borrower agrees that any suit or proceeding arising in respect to this Fee Letter or any matter referred to in this Fee Letter will be tried exclusively in the U.S. District Court for the Southern District of New York or, if that court does not have subject matter jurisdiction, in any state court located in the City of New York and Borrower agrees to submit to the jurisdiction of, and to venue in, such courts.

12. This Fee Letter may be executed in any number of counterparts, each of which when executed shall be an original, and all of which, when taken together, shall constitute one agreement. Delivery of an executed counterpart of a signature page of this Fee Letter by facsimile or electronic transmission shall be effective as delivery of a manually executed counterpart hereof.

[Remainder of page intentionally left blank]

Please confirm that the foregoing is in accordance with your understanding by signing and returning to us the enclosed copy of this Fee Letter, which shall become a binding agreement upon our receipt.

Very truly yours,

SIXTH STREET LENDING PARTNERS

By: /s/ Robert (Bo) Stanley
Name: Robert (Bo) Stanley
Title: Vice President

ACCEPTED AS OF THE DATE ABOVE:

ARROWHEAD PHARMACEUTICALS, INC.

By: /s/ Kenneth A. Myszkowski
Name: Kenneth A. Myszkowski
Title: Chief Financial Officer

STOCK PURCHASE AGREEMENT

THIS STOCK PURCHASE AGREEMENT (this "**Agreement**") is entered into as of November 25, 2024, by and among Arrowhead Pharmaceuticals, Inc., a Delaware corporation (the "**Company**"), and Sarepta Therapeutics Investments, Inc., a Delaware corporation ("**Purchaser**" and, together with the Company, the "**Parties**").

RECITALS

WHEREAS, the Company desires to issue and sell to Purchaser common stock, par value $0.0001 per share, of the Company (the "**Common Stock**") for an aggregate purchase price of $325,000,000; and

WHEREAS, the Company and Purchaser are executing and delivering this Agreement in reliance upon the exemption from securities registration afforded by Section 4(a)(2) of the Securities Act.

NOW, THEREFORE, in consideration of the mutual agreements, representations, warranties, covenants and conditions set forth in this Agreement, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto hereby agree as follows:

1. PURCHASE AND SALE

1.1 Sale and Issuance of the Shares. In reliance upon the representations, warranties and covenants set forth herein, and subject to the terms and conditions set forth in this Agreement, the Company shall issue and sell to Purchaser, and Purchaser shall purchase from the Company, 11,926,301 shares of Common Stock (the "**Shares**") at a purchase price per share equal to $27.2507. In the event of any stock dividend, stock split, combination of shares, recapitalization or other similar change in the capital structure of the Company after the date hereof and on or prior to the Closing that affects or relates to the Common Stock, the number of Shares to be issued to Purchaser pursuant to this Agreement shall be adjusted proportionately.

1.2 Closing.

(a) The purchase and sale of the Shares shall take place remotely at 10:00 a.m. (Pacific Time) on the Effective Date, as defined in that certain Exclusive License and Collaboration Agreement, dated as of November 25, 2024, by and between Purchaser and the Company (the "**Collaboration Agreement**"), or at such other time as the Company and Purchaser shall mutually agree (which time, date and place are referred to in this Agreement as the "**Closing**"). At the Closing, the Company shall instruct Computershare Trust Company (the "**Transfer Agent**") to register the issuance of the Shares (as defined below) via book entry, free and clear of all restrictive and other legends (except as expressly provided in Section 3.3(c)), against delivery to the Company by Purchaser at the Closing of $325,000,000.00, payable in immediately available funds by wire transfer to an account or accounts designated by the Company.

(b) At the Closing, the Company and Purchaser shall execute and deliver an investor rights agreement in the form attached as Exhibit A hereto (the "**Investor Rights Agreement**").

2. REPRESENTATIONS AND WARRANTIES OF THE COMPANY

As of the date hereof and as of the Closing, the Company represents and warrants to Purchaser that the statements contained in this Section 2 are true, complete and correct (except that those statements which address matters only as of a particular date are true, correct and complete as of such date).

2.1 Organization and Qualification. The Company and each subsidiary of the Company is a corporation duly organized, validly existing and in good standing under the laws of the State of Delaware and has the requisite corporate power and authority to own, lease and operate its properties and assets and to carry on its business as now conducted and as it is described in the SEC Filings (as defined below), and with respect to the Company, to enter into this Agreement and to consummate the transactions contemplated hereby. The Company and each subsidiary of the Company is duly qualified to transact business and is in good standing in each jurisdiction in which the failure to so qualify would or would be reasonably expected to have, individually or in the aggregate, a material adverse effect on (i) the business, properties, prospects, or financial condition of the Company or any of its subsidiaries, (ii) the ability of the Company to perform in a timely manner its obligations under this Agreement or to consummate the transactions contemplated hereby, or (iii) the enforceability of this Agreement (a "**Material Adverse Effect**"); provided that none of the following shall be taken into account in determining whether there is a Material Adverse Effect: (a) any change in the market price or trading volume of the Company's stock; (b) any change in the industries in which the Company or its subsidiaries operates generally or the United States economy or in other countries in which the Company conducts material operations, or in the financial markets or political conditions generally; (c) any change or effect arising from or relating to any change in legal requirements or generally accepted accounting principles ("**GAAP**") (or interpretations of any legal requirements or GAAP) unrelated to the transactions contemplated by this Agreement and of general applicability; or (d) any adverse change proximately caused by the public announcement of the execution of, this Agreement (provided any such public announcement is not in breach of this Agreement); provided, that such changes do not, individually or in the aggregate, have a disproportionate adverse impact on the Company, taken as a whole, relative to any other "person" as such term is defined under Section 3(a)(9) of the Securities Exchange Act of 1934, as amended (the "**Exchange Act**") and as used in Sections 13(d)(3) and 14(d)(2) of the Exchange Act ("**Person**") in the industries or markets in which the Company operates.

2.2 Certificate of Incorporation and Bylaws. The certificate of incorporation, bylaws and documents of similar substance (the "**Governing Documents**") of the Company and its subsidiaries that are on file with the United States Securities and Exchange Commission (the "**SEC**") are current, complete and correct copies thereof as in effect on the date hereof. The Governing Documents of the Company and its subsidiaries are in full force and effect. The Company and each subsidiary of the Company are in compliance with the terms of their respective Governing Documents.

2.3 Capitalization.

(a) As of November 22, 2024, the authorized capital stock of the Company consists of 295,000,000 shares of capital stock, of which 290,000,000 are designated as Common Stock and 5,000,000 are designated as preferred stock, $0.001 par value per share ("**Preferred Stock**"). As of November 22, 2024, (i) 124,435,942 shares of Common Stock were issued and outstanding; (ii) 1,952,234 shares of Common Stock were issuable (and such number was reserved for issuance) upon exercise of options to purchase Common Stock (the "**Options**") outstanding as of such date; (iii) 4,858,693 shares of Common Stock were issuable (and such number was reserved for issuance) upon vesting of restricted stock units for the issuance of Common Stock (the "**RSUs**") outstanding as of such date; (iv) no shares of Common Stock were issuable (and such number was reserved for issuance) upon exercise of warrants to purchase Common Stock (the "**Warrants**") outstanding as of such date; and (v) no shares of Preferred Stock were issued and outstanding.

(b) As of November 22, 2024, except for (i) the Options and (ii) the RSUs, there were no options, warrants or other rights to acquire capital stock or other equity interests from the Company, securities convertible into or exchangeable for such capital stock or other equity interests, stock appreciation rights, phantom stock, stock rights or other equity-based interests in respect of the Company. From November 22, 2024, 2024 to the date hereof, other than (A) shares of capital stock reserved for issuance as provided in this Section 2.3 and (B) options to purchase Common Stock or other equity awards issued in accordance with the Company's 2013 Incentive Plan and 2021 Incentive Plan and the Executive Incentive Plan, the Company has not issued any shares of its capital stock or other equity interests, or securities convertible into or exchangeable for such capital stock or other equity interests except as set forth in its filings under the Securities Act of 1933, as amended ("**Securities Act**"), and the Exchange Act. The Shares to be issued in connection with the Agreement, when issued as contemplated herein, will be duly authorized, validly issued, fully paid and nonassessable, will not be in violation of any preemptive rights and will be free and clear of all liens, charges, restrictions, claims, rights of first refusal and encumbrances except as set forth in this Agreement and the Company's Governing Documents. The issuance and sale of the Shares will not obligate the Company to issue shares of Common Stock or other securities to any Person (other than Purchaser) and will not result in a right of any holder of Company securities to adjust the exercise, conversion, exchange or reset price under any of such securities.

2.4 Authorization; Enforceability.

(a) The Company has all requisite corporate power and authority to execute, deliver and perform, as applicable, this Agreement and to issue and sell the Shares in accordance with the terms hereof.

(b) All corporate action on the part of the Company and its officers and directors necessary for (i) the authorization, execution, delivery and performance of all obligations of the Company under this Agreement has been taken and (ii) the issuance

and sale by the Company of the Shares hereunder has been taken. This Agreement constitutes a valid and legally binding obligation of the Company, enforceable in accordance with its terms, except (A) as limited by applicable bankruptcy, insolvency, reorganization, moratorium and other laws of general application affecting enforcement of creditors' rights generally or by equitable principles and (B) as limited by laws relating to the availability of specific performance, injunctive relief or other equitable remedies (the "**Equitable Exceptions**"). No action on the part of the Company's stockholders is necessary for the authorization, execution, delivery or performance of the Company's obligations hereunder.

2.5 SEC Filings; Financial Statements.

(a) The Company has timely filed with or furnished to the SEC all registration statements, prospectuses, forms, reports, definitive proxy statements, schedules and documents required to be filed by it under the Securities Act or the Exchange Act, as the case may be (collectively, the "**SEC Filings**"). Each SEC Filing, as amended or supplemented, if applicable, (i) as of its date, or, if amended, as of the date of the last such amendment, complied in all material respects with the applicable requirements of the Securities Act, the Exchange Act and the Sarbanes-Oxley Act of 2002, as amended (the "**Sarbanes-Oxley Act**"), as the case may be, and the rules and regulations of the SEC thereunder, applicable to such SEC Filing, and (ii) did not, at the time it was filed (or at the time it became effective in the case of registration statements), or, if amended, as of the date of the last such amendment, contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary in order to make the statements made therein, in the light of the circumstances under which they were made, not misleading. The Company has never been an issuer subject to Rule 144(i) under the Securities Act. The Company meets the registrant requirements for eligibility to use Form S-3 set forth in General Instruction I.A to Form S-3.

(b) Each of the consolidated financial statements (including, in each case, any notes thereto) contained in the SEC Filings, as amended, supplemented or restated, if applicable, was prepared in accordance with GAAP applied (except as may be indicated in the notes thereto and, in the case of unaudited quarterly financial statements, as permitted by the Form 10-Q under the Exchange Act) on a consistent basis throughout the periods indicated (except as may be indicated in the notes thereto), and each presented fairly, in all material respects, the consolidated financial position, results of operations and cash flows of the Company and the consolidated subsidiaries of the Company as of the respective dates thereof and for the respective periods indicated therein (subject, in the case of unaudited quarterly financial statements, to normal year-end adjustments).

(c) The Company and its subsidiaries have implemented and maintain a system of internal control over financial reporting (as required by Rule 13a-15(a) under the Exchange Act) that is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements in accordance with GAAP for external purposes and includes policies and procedures that (i) pertain to the maintenance of records that in reasonable detail accurately and fairly

reflect the transactions and dispositions of the assets of the Company, (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP and to maintain accountability of assets, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company, and (iii) provide reasonable assurance regarding the prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on its financial statements, and such system of internal control over financial reporting is reasonably effective.

(d) The Company has implemented and maintains disclosure controls and procedures (as defined in Rule 13a-15(d) of the Exchange Act) that are designed to ensure that information required to be disclosed by the Company in the reports it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time frames specified by the SEC's rules and forms (and such disclosure controls and procedures are reasonably effective), and has disclosed, based on its most recent evaluation of its system of internal control over financial reporting prior to the date of this Agreement, to the Company's independent registered accountant and the audit committee of the Board of Directors (A) any significant deficiencies and material weaknesses to the Company's knowledge in the design or operation of its internal control over financial reporting (as defined in Rule 13a-15(f) of the Exchange Act) and (B) to the Company's knowledge any fraud or allegation of fraud that involves management or other employees who have a significant role in the Company's internal control over financial reporting.

2.6 No Conflict; Required Filings and Consents.

(a) The execution and delivery of this Agreement by the Company does not, and the performance of this Agreement by the Company will not, (i) conflict with or violate any provision of the Governing Documents of the Company or its subsidiaries, (ii) conflict with or violate any law applicable to the Company or any of its subsidiaries or by which any property or asset of the Company or any of its subsidiaries is bound or affected or (iii) conflict with, or constitute a default (or an event which, with notice or lapse of time or both, would become a default) under, or give to others any rights of termination, amendment, acceleration or cancellation of, any a "material contract" (as such term is defined in Item 601(b)(10) of Regulation S-K of the SEC) (a "**Material Contract**") except for, in the case of each clause (ii) and (iii), conflicts, violations, or defaults, which, individually or in the aggregate, would not materially adversely affect the ability of Company to perform its obligations under this Agreement or to consummate the transactions contemplated hereby.

(b) The Company is not required to obtain any consent, waiver, authorization or order of, give any notice to, or make any filing or registration with, any federal, national, supranational, state, provincial, municipal, local or other government, governmental, regulatory or administrative authority, agency or commission or any court, tribunal, or judicial or arbitral body of competent jurisdiction ("**Governmental Authority**") or other Person in connection with the execution, delivery and performance

by the Company of the issuance of the Shares, other than (i) (A) the filing of a registration statement with the SEC in accordance with the requirements of the Investor Rights Agreement, (B) filings required by applicable Blue Sky Laws, (C) the filing of any requisite notices to the Nasdaq Global Select Market for the issuance and sale of the Shares and the listing of the Shares thereon in the time and manner required thereby, (D) any filing required under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended, or other Merger Control Laws and (E) those that have been made or obtained prior to the date of this Agreement, or (ii) where failure to obtain such consents, approvals, authorizations or permits, or to make such filings or notifications, would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect.

2.7 Employees and Employee Matters. Except as would not reasonably be expected to have a Material Adverse Effect and except as set forth in the SEC Filings filed or furnished to the SEC after the end of the Company's most recently completed fiscal year through the date hereof (excluding any disclosure contained under the heading "Risk Factors" and in any "forward-looking statements" disclaimer or in any other precautionary statements, and in any exhibits thereto) (the "**SEC Disclosure**"), the Company and its subsidiaries has complied with all federal, state and local laws relating to the hiring of employees, consultants and advisors and the employment of labor, including provisions thereof relating to wages, hours, equal opportunity, collective bargaining and the payment of social security and other taxes. Neither the Company nor any of its subsidiaries is delinquent in material payments to any of its employees for any wages, salaries, commissions, bonuses or other direct compensation for any services performed by them to date or amounts required to be reimbursed to such employees or upon any termination of the employment of any such employees. In the past three years, no allegations of workplace misconduct or questionable business practices have been made in writing, or, to the Company's knowledge, threatened against or involving any current or former officer, director or member of the senior management of the Company.

2.8 Litigation. Except as set forth in the SEC Disclosure, there is no material action, suit or proceeding pending or, to the Company's knowledge, currently threatened against the Company or any of its subsidiaries or against any director, officer or employee of the Company or any of its subsidiaries, or, to the Company's knowledge, facts or circumstances that are reasonably likely to result in such an action, suit or proceeding. Neither the Company nor any of its subsidiaries is a party to, or subject to the provisions of, any order, writ, injunction, judgment or decree of any court or government agency or instrumentality. There is no material action, suit, proceeding or investigation by the Company or any of its subsidiaries currently pending or that the Company any of its subsidiaries intends to initiate. There has not been and, to the knowledge of the Company, there is not pending or contemplated in writing, any investigation by the SEC or other Governmental Authority involving the Company or any current or former director or officer of the Company.

2.9 Taxes. Except as would not reasonably be expected to have a Material Adverse Effect and except as set forth in the SEC Disclosure, (i) all federal, state and local tax returns, reports and declarations of the Company required by law to be filed have been duly filed, (ii) all taxes and other fees due thereon have been paid and (iii) the Company has set aside on its books provisions reasonably adequate for the payment of all material taxes for periods

subsequent to the periods to which such returns, reports or declarations apply. There is no tax lien, whether imposed by any federal, state, county or local taxing authority, outstanding against the assets, properties or business of the Company or any of its subsidiaries. There are no unpaid taxes in any material amount claimed to be due by the taxing authority of any jurisdiction, and the officers of the Company know of no basis for any such claim.

2.10 Listing and Maintenance Requirements. The Common Stock is registered pursuant to Section 12(b) or 12(g) of the Exchange Act, and the Company has taken no action designed to, or which to its knowledge is reasonably likely to have the effect of, terminating the registration of the Common Stock under the Exchange Act nor has the Company received any notification that the SEC is contemplating terminating such registration. The Company has complied with the requirements of the Nasdaq Global Select Market for continued listing of the Common Stock thereon and has not received any notification that the Nasdaq Global Select Market is contemplating terminating such listing. The Company has no reason to believe that it will not upon issuance of the Shares continue to be in compliance with all such listing and maintenance requirements. The issuance of the Shares hereunder does not contravene the rules of the Nasdaq Global Select Market.

2.11 Offering Exemption. Based in part on the representations of Purchaser set forth in Section 3.3 below, the offer, sale and issuance of the Shares in conformity with the terms of this Agreement are exempt from the registration requirements of the Securities Act and are exempt from the qualification or registration requirements of applicable state securities laws. Neither the Company nor its affiliates, nor any agent on its or their behalf, (i) has engaged in any form of general solicitation or general advertising (within the meaning of Regulation D under the Securities Act) in connection with the transactions contemplated by this Agreement, (ii) has solicited or will solicit any offers to sell or has offered to sell or will offer to sell all or any part of the Shares to any Person or Persons so as to bring the sale of the Shares by the Company within the registration provisions of the Securities Act or any state securities laws or (iii) has issued any shares of Common Stock or shares of any series of Preferred Stock or other securities or instruments convertible into, exchangeable for or otherwise entitling the holder thereof to acquire shares of Common Stock which would be integrated with the sale of the Shares to Purchaser for purposes of the Securities Act or of any applicable stockholder approval provisions, including, without limitation, under the rules and regulations of any exchange or automated quotation system on which any of the securities of the Company are listed or designated, nor will the Company or any of its subsidiaries or affiliates take any action or steps that would require registration of any of the Shares under the Securities Act.

2.12 Affiliate Transactions. No employee, officer, director or 10% or greater stockholder of the Company or member of his or her immediate family (each a "**Covered Person**") is currently indebted to the Company, nor is the Company indebted (or committed to make loans or extend or guarantee credit) to any Covered Person. Except as disclosed in the SEC Filings, as of the date hereof, no Covered Person has any direct or indirect ownership interest in any firm or corporation with which the Company is affiliated or with which the Company has a business relationship, or any firm or corporation that competes with the Company (except for ownership of stock not to exceed 1% of the outstanding capital stock of any publicly traded company that may compete with the Company).

2.13 Investment Company Act. The Company is not, and is not an Affiliate (as defined below) of, and after giving effect to the consummation of the transactions contemplated by this Agreement, will not be and will not be an Affiliate of, an "investment company" or an entity "controlled" by an "investment company," as such terms are defined in the Investment Company Act of 1940. For purposes of this Agreement, "**Affiliate**" shall mean any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

2.14 Compliance with Rule 506. None of the Company, any of its predecessors, any director, executive officer, other officer of the Company participating in the offering contemplated hereby, any beneficial owner of 20% or more of the Company's outstanding voting equity securities, calculated on the basis of voting power, nor any promoter (as that term is defined in Rule 405 under the Securities Act) connected with the Company in any capacity at the time of sale is disqualified from relying on Rule 506 of Regulation D under the Securities Act ("**Rule 506**") for any of the reasons stated in Rule 506(d) in connection with the issuance and sale of the Shares to Purchaser pursuant to this Agreement.

2.15 Material Changes; Undisclosed Events, Liabilities or Developments. Since the date of the latest financial statements included within the SEC Filings: (i) there has been no event, occurrence or development that has had or that could reasonably be expected to have a Material Adverse Effect, (ii) the Company has not incurred any material liabilities (contingent or otherwise) other than expenses incurred in the ordinary course of business consistent with past practice, (iii) the Company has not altered its method of accounting, (iv) the Company has not declared or made any dividend or distribution of cash or other property to the holders of its Common Stock or purchased, redeemed or made any agreements to purchase or redeem any shares of its capital stock and (v) the Company has not issued any equity securities to any officer, director or Affiliate, except pursuant to existing Company equity compensation plans or upon the exercise of options or warrants previously reported on a Statement of Beneficial Ownership filed under Section 16 of the Exchange Act. Except for the issuance of the Shares contemplated by this Agreement, no event, liability, fact, circumstance, occurrence or development has occurred or exists or is reasonably expected to occur or exist with respect to the Company and its subsidiaries or their business, properties, operations, assets or financial condition, that would be required to be disclosed by the Company under applicable securities laws if the Company were publicly offering securities pursuant to an effective registration statement under the Securities Act at the time this representation is made or deemed made.

2.16 Labor Relations. Except as set forth in the SEC Disclosure, no material labor dispute exists or, to the knowledge of the Company, is threatened with respect to any of the employees of the Company or any of its subsidiaries, which could reasonably be expected to result in a Material Adverse Effect. None of the Company's or its subsidiaries' employees is a member of a union that relates to such employee's relationship with the Company or any such subsidiary, neither the Company nor any of its subsidiaries is a party to any collective bargaining agreement, and the Company believes that its and its subsidiaries' relationships with its or their employees are good. The Company and its subsidiaries are in compliance with all U.S. federal, state, local and foreign laws and regulations relating to employment and employment practices, terms and conditions of employment and wages and hours, except where the failure to be in

compliance could not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect.

2.17 Environmental Matters. Except as set forth in the SEC Disclosure, the Company and its subsidiaries are in compliance with and have not received notice of any actual or potential liability under or relating to, or actual or potential violation of, applicable federal, state and local laws, rules and regulations relating to the use, treatment, storage and disposal of hazardous or toxic substances or waste and protection of health and safety or the environment which are applicable to its business (the "**Environmental Laws**"). The Company has not received notice of any actual or potential liability under or relating to, or actual or potential violation of, any Environmental Laws, including for the investigation or remediation of any release or threat of release of hazardous materials, and has no knowledge of any event or condition that would reasonably be expected to result in any such notice. The Company is not aware of any facts or issues regarding its compliance with Environmental Laws, or liabilities or other obligations under Environmental Laws, that, individually or in the aggregate, would reasonably be expected to have a Material Adverse Effect, and the Company does not anticipate material capital expenditures relating to any Environmental Laws.

2.18 Title to Assets; Intellectual Property Matters.

(a) Except as set forth in the SEC Disclosure, the Company or any of its subsidiaries, as applicable, has good and marketable title in all personal property owned by the Company or any such subsidiary that is material to the business of the Company and its subsidiaries, in each case free and clear of all liens, except for liens as do not materially affect the value of such property and do not materially interfere with the use made and proposed to be made of such property by the Company or any of its subsidiaries and liens for the payment of federal, state or other taxes, the payment of which is neither delinquent nor subject to penalties. Except as set forth in the SEC Disclosure, any real property and facilities held under lease by the Company or any of its subsidiaries are held by it under valid, subsisting and enforceable leases with which the Company or any such subsidiary are in compliance.

(b) Except as set forth in the SEC Disclosure, the Company owns, possesses, licenses or has other rights to use, on reasonable terms, all patents, patent applications, trade and service marks, trade and service mark registrations, trade names, copyrights, licenses, inventions, trade secrets, technology, know-how and other intellectual property (collectively, the "**Intellectual Property**") necessary for the conduct of the Company's business as now conducted or as proposed in the SEC Filings to be conducted (the "**Company Intellectual Property**"). To the knowledge of the Company, there are no rights of third parties to any Company Intellectual Property, other than as licensed by the Company. To the knowledge of the Company, there is no infringement by third parties of any Company Intellectual Property. There is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the Company's rights in or to any Company Intellectual Property. There is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the validity or scope of any Company Intellectual Property. There is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by

others that the Company infringes or otherwise violates any patent, trademark, copyright, trade secret or other proprietary rights of others. The Company is not aware of any facts required to be disclosed to the U.S. Patent and Trademark Office ("**USPTO**") that have not been disclosed to the USPTO and that would preclude the grant of a patent in connection with any patent application of the Company Intellectual Property or could form the basis of a finding of invalidity with respect to any issued patents of the Company Intellectual Property.

2.19 Insurance. The Company and its subsidiaries are insured by insurers of recognized financial responsibility against such losses and risks and in such amounts as are prudent and customary in the business in which the Company and its subsidiaries are engaged, including, but not limited to, directors' and officers' insurance. The Company does not have any reason to believe that it will not be able to renew its existing insurance coverage as and when such coverage expires or to obtain similar coverage from similar insurers as may be necessary to continue its business without a significant increase in cost.

2.20 Registration Rights. Except as provided for in the Investor Rights Agreement, no Person has any right to cause the Company to effect the registration under the Securities Act of any securities of the Company.

2.21 Application of Takeover Protections. The Company and the Board of Directors have taken all necessary action, if any, in order to render inapplicable any control share acquisition, business combination, poison pill (including any distribution under a rights agreement) or other similar anti-takeover provision under the Company's certificate of incorporation or the laws of its state of incorporation that is or could become applicable to Purchaser as a result of Purchaser and the Company fulfilling their obligations or exercising their rights under this Agreement, including without limitation as a result of the Company's issuance of the Shares and Purchaser's ownership of the Shares.

2.22 Accountants. The Company's independent registered public accounting firm is currently KPMG, LLP and was Rose, Snyder & Jacobs LLP for the fiscal years ended September 30, 2022 and 2023. Such accounting firms are registered public accounting firms, as required by the Exchange Act. There are no disagreements of any kind presently existing or reasonably anticipated by the Company to arise between the Company and such accounting firms.

2.23 Compliance with Laws.

(a) Except as set forth in the SEC Disclosure, (i) the Company is and has been in compliance, in all material respects, with statutes, laws, ordinances, rules and regulations applicable to the Company for the ownership, testing, development, manufacture, packaging, processing, use, labeling, storage, or disposal of any product manufactured by or on behalf of the Company or out-licensed by the Company (a "**Company Product**"), including without limitation, the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 301, et seq., the Public Health Service Act, 42 U.S.C. § 262, similar laws of other Governmental Authorities and the regulations promulgated pursuant to such laws (collectively, "**Applicable Laws**"); (ii) the Company possesses all material

licenses, certificates, approvals, authorizations, permits and supplements or amendments thereto required by any such Applicable Laws and/or for the ownership of its properties or the conduct of its business as it relates to a Company Product and as described in the SEC Filings (collectively, "**Authorizations**") and such Authorizations are valid and in full force and effect and the Company is not in violation of any term of any such Authorizations; (iii) the Company has not received any written notice of adverse finding, warning letter or other written correspondence or notice from the U.S. Food and Drug Administration (the "**FDA**") or any other Governmental Authority alleging or asserting noncompliance with any Applicable Laws or Authorizations relating to a Company Product; (iv) the Company has not received written notice of any ongoing claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action from any Governmental Authority or third party alleging that any Company Product, operation or activity related to a Company Product is in violation of any Applicable Laws or Authorizations or has any knowledge that any such Governmental Authority or third party is considering any such claim, litigation, arbitration, action, suit, investigation or proceeding, nor, to the Company's knowledge, has there been any material noncompliance with or violation of any Applicable Laws by the Company that would reasonably be expected to require the issuance of any such written notice or result in an investigation, corrective action, or enforcement action by the FDA or similar Governmental Authority with respect to a Company Product; (v) the Company has not received written notice that any Governmental Authority has taken, is taking or intends to take action to limit, suspend, modify or revoke any Authorizations or has any knowledge that any such Governmental Authority has threatened or is considering such action with respect to a Company Product; and (vi) the Company has filed, obtained, maintained or submitted all material reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments as required by any Applicable Laws or Authorizations and that all such reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were complete, correct and not misleading on the date filed (or were corrected or supplemented by a subsequent submission).

(b) Except as set forth in the SEC Disclosure, to the Company's knowledge, neither the Company nor any of its directors, officers, employees or agents, has made, or caused the making of, any false statements on, or material omissions from, any other records or documentation prepared or maintained to comply with the requirements of the FDA or any other Governmental Authority.

(c) Except as set forth in the SEC Disclosure, the clinical studies and tests conducted by the Company or on behalf of the Company, have been and, if still pending, are being conducted in all material respects pursuant to all Applicable Laws and Authorizations; the descriptions of the results of such clinical studies and tests contained in the SEC Filings are accurate and complete in all material respects and fairly present the data derived from such clinical studies and tests; the Company is not aware of any clinical studies or tests, the results of which the Company believes reasonably call into question the research, nonclinical or clinical study or test results described or referred to in the SEC Filings when viewed in the context in which such results are described; and the Company has not received any written notices or correspondence from any

Governmental Authority requiring the termination, suspension or material modification of any clinical study or test conducted by or on behalf of the Company.

2.24 Anti-Bribery and Anti-Money Laundering Laws. Each of the Company, its subsidiaries and, to the knowledge of the Company, any of their respective officers, directors, supervisors, managers, agents, or employees are and have at all times been in compliance with and its participation in the offering will not violate: (a) anti-bribery laws, including but not limited to, any applicable law, rule, or regulation of any locality, including but not limited to any law, rule, or regulation promulgated to implement the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, signed December 17, 1997, including the U.S. Foreign Corrupt Practices Act of 1977, as amended, the U.K. Bribery Act 2010, or any other law, rule or regulation of similar purposes and scope or (b) anti-money laundering laws, including, but not limited to, applicable federal, state, international, foreign or other laws, regulations or government guidance regarding anti-money laundering, including, without limitation, Title 18 U.S. Code Sections 1956 and 1957, the Patriot Act, the Bank Secrecy Act, and international anti-money laundering principles or procedures by an intergovernmental group or organization, such as the Financial Action Task Force on Money Laundering, of which the United States is a member and with which designation the United States representative to the group or organization continues to concur, all as amended, and any executive order, directive, or regulation pursuant to the authority of any of the foregoing, or any orders or licenses issued thereunder.

2.25 Cybersecurity. Except as set forth in the SEC Disclosure, the Company and its subsidiaries' information technology assets and equipment, computers, systems, networks, hardware, software, websites, applications, and databases (collectively, "**IT Systems**") are adequate for, and operate and perform in all material respects as required in connection with the operation of the business of the Company and its subsidiaries as currently conducted, and are free and clear of all material Trojan horses, time bombs, malware and other malicious code. Except as set forth in the SEC Disclosure, the Company and its subsidiaries have implemented and maintained commercially reasonable physical, technical and administrative controls designed to maintain and protect the confidentiality, integrity, availability, privacy and security of all sensitive, confidential or regulated data ("**Confidential Data**") used or maintained in connection with their businesses and Personal Data (defined below), and the integrity, availability continuous operation, redundancy and security of all IT Systems. "**Personal Data**" means the following data used in connection with the Company's and its subsidiaries' businesses and in their possession or control: (i) a natural person's name, street address, telephone number, e-mail address, photograph, social security number or other tax identification number, driver's license number, passport number, credit card number or bank information; (ii) information that identifies or may reasonably be used to identify an individual; (iii) any information that would qualify as "protected health information" under the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act (collectively, "**HIPAA**"); and (iv) any information that would qualify as "personal data," "personal information" (or similar term) under the Privacy Laws. Except as set forth in the SEC Disclosure, to the Company's knowledge, there have been no breaches, outages or unauthorized uses of or accesses to the Company's IT Systems, Confidential Data, or Personal Data that would require notification under Privacy Laws (as defined below).

2.26 Compliance with Data Privacy Laws. Except as set forth in the SEC Disclosure, the Company and its subsidiaries are, and at all prior times were, in material compliance with all applicable state, federal and foreign data privacy and security laws and regulations regarding the collection, use, storage, retention, disclosure, transfer, disposal, or any other processing (collectively "**Processing**") of Personal Data, including without limitation HIPAA, the EU General Data Protection Regulation (Regulation (EU) No. 2016/679), all other local, state, federal, national, supranational and foreign laws relating to the regulation of the Company or its subsidiaries, and the regulations promulgated pursuant to such statutes and any state or non-U.S. counterpart thereof (collectively, the "**Privacy Laws**"). To ensure material compliance with the Privacy Laws, the Company and its subsidiaries have in place, comply with, and take all appropriate steps necessary to ensure compliance in all material respects with their policies and procedures relating to data privacy and security, and the Processing of Personal Data and Confidential Data (the "**Privacy Statements**"). The Company and its subsidiaries have, except as would not reasonably be expected, individually or in the aggregate, to result in a Material Adverse Effect, at all times since inception provided accurate notice of their Privacy Statements then in effect to its customers, employees, third party vendors and representatives. None of such disclosures made or contained in any Privacy Statements have been materially inaccurate, misleading, incomplete, or in material violation of any Privacy Laws.

2.27 Brokers. There is no investment banker, broker, finder, financial advisor, placement agent or other Person that has been retained by or is authorized to act on behalf of the Company or any of its subsidiaries that might be entitled to any fee or commission in connection with the transactions contemplated by this Agreement.

2.28 Suppliers and Customers. Neither the Company nor any of its subsidiaries has any knowledge of any termination, cancellation or threatened termination or cancellation or limitation of, or any material dissatisfaction with, the business relationship between the Company or any such subsidiary and any material supplier, customer, vendor, customer or client.

2.29 Acknowledgement. The Company acknowledges and agrees that Purchaser is acting solely in the capacity of an arm's length purchaser with respect to this Agreement and the transactions contemplated hereby. The Company further acknowledges that Purchaser is not acting as a financial advisor or fiduciary of the Company (or in any similar capacity) with respect to this Agreement and the transactions contemplated hereby and any advice given by Purchaser or any of their respective representatives or agents in connection with this Agreement and the transactions contemplated hereby is merely incidental to Purchaser's purchase of the Shares. The Company further represents to Purchaser that the Company's decision to enter into this Agreement has been based solely on the independent evaluation of the transactions contemplated hereby by the Company and its representatives.

2.30 Regulation M Compliance. The Company has not, and to its knowledge no one acting on its behalf has, (a) taken, directly or indirectly, any action designed to cause or to result in the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of any of the Shares, (b) sold, bid for, purchased, or paid any compensation for soliciting purchases of, any of the Shares, or (c) paid or agreed to pay to any Person any compensation for soliciting another to purchase any other securities of the Company.

3. REPRESENTATIONS AND WARRANTIES OF PURCHASER

As of the date hereof and as of the Closing, Purchaser represents and warrants to the Company that the statements contained in this Section 3 are true, complete and correct:

3.1 Authorization; Enforceability. Purchaser has the requisite corporate power and authority to execute, deliver and perform this Agreement. All action on the part of Purchaser and, as applicable, its officers and directors necessary for the authorization, execution, delivery and performance of all obligations of Purchaser under this Agreement has been taken. This Agreement constitutes the valid and legally binding obligations of Purchaser, enforceable in accordance with their terms, except as limited by the Equitable Exceptions.

3.2 No Conflict; Required Filings and Consents.

(a) The execution and delivery of this Agreement by Purchaser does not, and the performance of this Agreement by Purchaser will not, (i) conflict with or violate any provision of the Governing Documents of Purchaser, (ii) conflict with or violate any law applicable to Purchaser or by which any property or asset of Purchaser is bound or affected or (iii) conflict with, or constitute a default (or an event which, with notice or lapse of time or both, would become a default) under, or give to others any rights of termination, amendment, acceleration or cancellation of, any Material Contract except for, in the case of each clause (ii) and (iii), conflicts, violations, or defaults, which, individually or in the aggregate, would not materially adversely affect the ability of Purchaser to perform its obligations under this Agreement or to consummate the transactions contemplated hereby.

(b) Purchaser is not required to obtain any consent, waiver, authorization or order of, give any notice to, or make any filing or registration with, any Governmental Authority or other Person in connection with the execution, delivery and performance by Purchaser of its obligations under this Agreement, other than (i) any filing required under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended, or other Merger Control Laws, or (ii) where failure to obtain such consents, approvals, authorizations or permits, or to make such filings or notifications, would not, individually or in the aggregate, would not materially adversely affect the ability of Purchaser to perform its obligations under this Agreement or to consummate the transactions contemplated hereby.

3.3 Investor Representations.

(a) The Shares acquired by Purchaser hereunder will be acquired by Purchaser for its own account for investment purposes and not with a view to distribution in violation of the Securities Act. Purchaser does not presently have any contract, undertaking or agreement with any Person to sell, transfer or grant participation rights to such Person or to any other Person with respect to any of the Shares acquired by Purchaser hereunder.

(b) Purchaser is an "accredited investor" within the meaning of Rule 501(a) promulgated under the Securities Act.

(c) Purchaser acknowledges and agrees that the Shares are being offered in a transaction not involving any public offering within the meaning of the Securities Act, and Purchaser understands that the Shares have not been registered under the Securities Act, by reason of their issuance by the Company in a transaction exempt from the registration requirements of the Securities Act, and that the Shares must continue to be held and may not be offered, resold, transferred, pledged or otherwise disposed of by Purchaser unless a subsequent disposition thereof is registered under the Securities Act or is exempt from such registration and in each case in accordance with any applicable securities laws of any state of the United States. Purchaser understands that the exemptions from registration afforded by Rule 144 (the provisions of which are known to it) promulgated under the Securities Act depend on the satisfaction of various conditions including, but not limited to, the time and manner of sale, the holding period and on requirements relating to the Company which are outside of Purchaser's control and which the Company may not be able to satisfy, and that, if applicable, Rule 144 may afford the basis for sales only in limited amounts. Purchaser acknowledges and agrees that it has been advised to consult legal counsel prior to making any offer, resale, transfer, pledge or disposition of any of the Shares. Purchaser acknowledges that no federal or state agency has passed upon or endorsed the merits of the offering of the Shares or made any findings or determination as to the fairness of this investment.

(d) Purchaser understands that any certificates or book entry notations evidencing the Shares may bear the following legend:

> "THE SECURITIES REPRESENTED HEREBY HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), OR THE SECURITIES LAWS OF ANY STATE OF THE UNITED STATES. THE SECURITIES HAVE BEEN ACQUIRED FOR INVESTMENT AND MAY NOT BE SOLD, TRANSFERRED OR ASSIGNED UNLESS (I) SUCH SECURITIES HAVE BEEN REGISTERED FOR SALE PURSUANT TO THE SECURITIES ACT, (II) SUCH SECURITIES MAY BE SOLD PURSUANT TO RULE 144, (III) THE COMPANY HAS RECEIVED AN OPINION OF COUNSEL REASONABLY SATISFACTORY TO IT THAT SUCH TRANSFER MAY LAWFULLY BE MADE WITHOUT REGISTRATION UNDER THE SECURITIES ACT, OR (IV) THE SECURITIES ARE TRANSFERRED WITHOUT CONSIDERATION TO AN AFFILIATE OF SUCH HOLDER OR A CUSTODIAL NOMINEE (WHICH FOR THE AVOIDANCE OF DOUBT SHALL REQUIRE NEITHER CONSENT NOR THE DELIVERY OF AN OPINION)."

(e) Purchaser acknowledges and agrees that it can bear the economic risk and complete loss of its investment in the Shares and has such knowledge and experience in financial or business matters that it is capable of evaluating the merits and risks of the investment in the Shares.

(f) Purchaser is not relying and has not relied on any representations or warranties whatsoever regarding the subject matter of this Agreement, express or

implied, except for the representations and warranties in Section 2. Such representations and warranties by the Company constitute the sole and exclusive representations and warranties of the Company in connection with the transactions contemplated by this Agreement and Purchaser understands, acknowledges and agrees that all other representations and warranties of any kind or nature whether express, implied or statutory are specifically disclaimed by the Company.

(g) In connection with the due diligence investigation of the Company by Purchaser and its Affiliates, stockholders, directors, officers, employees, agents, representatives or advisors, Purchaser and its Affiliates, stockholders, directors, officers, employees, agents, representatives and advisors have received and may continue to receive after the date hereof from the Company and its Affiliates, stockholders, directors, officers, employees, consultants, agents, representatives and advisors certain estimates, projections, forecasts and other forward-looking information, as well as certain business plan information, regarding the Company and its business and operations. Purchaser hereby acknowledges that there are uncertainties inherent in attempting to make such estimates, projections, forecasts and other forward-looking statements, as well as in such business plans, and that Purchaser will have no claim against the Company, or any of its Affiliates, stockholders, directors, officers, employees, consultants, agents, representatives or advisors, or any other Person with respect thereto unless any such information is expressly addressed or included in a representation or warranty contained in this Agreement. Accordingly, Purchaser hereby acknowledges and agrees that neither the Company nor any of its respective Affiliates, stockholders, directors, officers, employees, consultants, agents, representatives or advisors, nor any other Person, has made or is making any express or implied representation or warranty with respect to such estimates, projections, forecasts, forward-looking statements or business plans unless any such information is expressly addressed or included in a representation or warranty contained in this Agreement.

(h) Purchaser understands that nothing in this Agreement or any other materials presented by or on behalf of the Company to Purchaser in connection with the purchase of the Shares constitutes legal, tax or investment advice. Purchaser has consulted such legal, tax and investment advisors as it, in such Purchaser's sole discretion, has deemed necessary or appropriate in connection with its purchase of the Shares.

3.4 Brokers. There is no investment banker, broker, finder, financial advisor, placement agent or other Person that has been retained by or is authorized to act on behalf of Purchaser that might be entitled to any fee or commission in connection with the transactions contemplated by this Agreement.

3.5 Compliance with Laws. Neither Purchaser nor, to Purchaser's knowledge, any director, officer, agent, employee or Person acting on behalf of Purchaser, is currently subject to any U.S. sanctions administered by the Office of Foreign Assets Control of the U.S. Treasury Department.

4. CONDITIONS TO PURCHASER'S OBLIGATIONS AT CLOSING

The obligations of Purchaser under this Agreement to purchase and pay for the Shares being purchased by Purchaser at Closing are subject to the satisfaction or waiver of the following conditions:

4.1 Representations and Warranties. (i) The representations and warranties of the Company contained in Section 2.1, Section 2.2, Section 2.3, Section 2.4, Section 2.5, Section 2.6, Section 2.11, Section 2.14, Section 2.29 and Section 2.30 of this Agreement shall be true, correct and complete in all material respects on and as of Closing except those representations and warranties qualified by materiality, which shall be true and correct in all respects (except that those representations and warranties which address matters only as of a particular date need only be measured as of the specific date) and (ii) the representations and warranties of the Company in Section 2.7, Section 2.8, Section 2.9, Section 2.10, Section 2.12, Section 2.13 and Sections 2.15 through 2.28 of this Agreement shall be true, correct and complete on and as of Closing, except that any inaccuracies in such representations and warranties will be disregarded if they collectively do not constitute and would not reasonably be expected to have a Material Adverse Effect on the Company (it being understood that for purposes of determining the accuracy of any representation or warranties all Material Adverse Effect and other materiality qualifications contained in such representations and warranties will be disregarded).

4.2 Performance. The Company shall have performed and complied in all material respects with all other conditions, covenants and agreements contained in this Agreement required to be performed or complied with by it on or before the Closing and no Material Adverse Effect or event that would reasonably be expected to result in a Material Adverse Effect shall have occurred.

4.3 Legal Investment. On the date of the applicable Closing, the sale and issuance of the Shares shall be legally permitted by all laws and regulations to which Purchaser and the Company are subject.

4.4 No Suspension. Trading in the Common Stock shall not have been suspended by the SEC or the Nasdaq Global Select Market. The Shares shall be eligible for listing on the Nasdaq Global Select Market.

4.5 Approvals. All necessary clearances, approvals, authorizations, or waiting period expirations or terminations in connection with the HSR Filings have been received or obtained, in each case to the extent required.

4.6 Qualifications. All authorizations, approvals or permits, if any, of any Governmental Authority that are required in connection with the lawful issuance and sale of the Shares pursuant to this Agreement shall have been duly obtained and shall be effective on and as of the applicable Closing.

4.7 No Injunction. No statute, rule, regulation, executive order, decree, ruling or injunction shall have been enacted, entered, promulgated or endorsed by any Governmental Authority of competent jurisdiction which prohibits the consummation of any of the transactions contemplated by this Agreement.

4.8 Compliance Certificate. An officer or other authorized representative of the Company shall have delivered to Purchaser at the Closing a certificate certifying that the conditions specified in Sections 4.1 and 4.2 have been fulfilled.

4.9 Opinion. A legal opinion of Company Counsel, dated as of the Closing, the form and substance of which opinion shall be reasonably satisfactory to Purchaser, executed by such counsel and addressed to Purchaser, shall have been delivered to Purchaser.

4.10 Investor Rights Agreement. The Investor Rights Agreement shall have been executed by the Company and delivered to Purchaser.

4.11 Board Appointment. Doug Ingram shall have been appointed as a member of the Board of Directors of the Company.

5. CONDITIONS TO THE COMPANY'S OBLIGATIONS AT CLOSING

The obligations of the Company under this Agreement to sell and issue to Purchaser the Shares to be purchased by Purchaser at Closing are subject to the satisfaction or waiver, at or prior to the applicable Closing, of the following conditions:

5.1 Representations and Warranties. The representations and warranties of Purchaser contained in Section 3 shall be true, correct and complete in all material respects on and as of the Closing with the same force and effect as if they had been made at such time (except that those representations and warranties which address matters only as of a particular date need only be true, correct and complete in all material respects as of such date).

5.2 Performance. Purchaser shall have performed and complied in all material respects with all other conditions, covenants and agreements contained in this Agreement required to be performed or complied with by Purchaser on or before the Closing.

5.3 No Injunction. No statute, rule, regulation, executive order, decree, ruling or injunction shall have been enacted, entered, promulgated or endorsed by any Governmental Authority of competent jurisdiction which prohibits the consummation of any of the transactions contemplated by this Agreement.

5.4 Approvals. All necessary clearances, approvals, authorizations, or waiting period expirations or terminations in connection with the HSR Filings have been received or obtained, in each case to the extent required.

6. COVENANTS

6.1 Purchaser Lock-Up. Purchaser covenants and agrees as follows:

(a) Purchaser will not, without the prior written consent of the Company, during the period commencing on the date of Closing and ending 180 days after the Closing (the "**Lock-Up Period**"), (A) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend or otherwise transfer or dispose of, directly or

indirectly, any Shares or (B) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of the Shares, whether any such transaction described in clause (A) or (B) above is to be settled by delivery of the Shares purchased in such Closing, in cash or otherwise. Notwithstanding the foregoing, Purchaser may transfer the Shares to any of its stockholders or Affiliates; *provided* that in the case of any transfer or distribution pursuant to this subparagraph during the Lock-Up Period, each donee or transferee shall sign and deliver a lock-up letter with terms substantially similar to the terms of this Section 6.1.

(b) Notwithstanding anything to the contrary contained herein, Purchaser agrees that Purchaser shall not effect any sale, transfer or other disposition of any Shares: (a) such sale, transfer or other disposition is effected pursuant to an effective registration statement under the Securities Act; (b) such sale, transfer or other disposition is made in conformity with the requirements of Rule 144, as evidenced by a broker's letter and a representation letter executed by Purchaser (reasonably satisfactory in form and content to the Company) stating that such requirements have been met; or (c) counsel reasonably satisfactory to the Company (which may be counsel to the Company) shall have advised the Company in a written opinion letter (reasonably satisfactory in form and content to the Company), upon which the Company may rely, that such sale, transfer or other disposition will be exempt from the registration requirements of the Securities Act.

(c) Notwithstanding any other provision of this Section 6.1, this Section 6.1 shall not prohibit or restrict any disposition of Common Stock by Purchaser in connection with (i) a bona fide tender offer by a Person other than Purchaser or the Company that is not opposed by the Board of Directors and involving a Change of Control of the Company (as defined below); or (ii) an issuer tender offer by the Company; *provided*, that in the event that the tender offer is not completed, the Shares shall remain subject to the restrictions contained in this Section 6.1. For the purposes of this Agreement, a "**Change of Control**" means (i) the transfer, in one transaction or a series of related transactions, to a person or group of affiliated persons, of shares of capital stock of the Company if, after such transfer, the stockholders of the Company immediately prior to such transfer do not own at least 50% of the outstanding voting securities of the Company (or the surviving entity), or (ii) a merger, consolidation, recapitalization or reorganization of the Company is consummated, other than any such transaction that would result in stockholders of the Company immediately prior to such transaction owning at least 50% of the outstanding voting securities of the surviving entity (or its parent entity) immediately following such transaction.

(d) Purchaser acknowledges and agrees that stop transfer instructions will be given to the Company's transfer agent with respect to the Shares until the expiration of the Lock-Up Period.

6.2 Commercial Reasonable Efforts. Each party will use commercially reasonable efforts to satisfy in a timely fashion each of the conditions to be satisfied by it under this Agreement.

6.3 Standstill. During the period commencing on the Effective Date and ending on the earliest of: (i) five years following the Effective Date, (ii) the date on which any third party unaffiliated with Purchaser commences a tender offer or exchange offer for more than 50% of the Company's outstanding Common Stock, (iii) the date the Company publicly announces its intent to pursue a Change of Control, consider "strategic alternatives" or similar transactions and (iv) the termination of the Collaboration Agreement, none of Purchaser, Sarepta Therapeutics, Inc., or any of the controlled subsidiaries of Sarepta Therapeutics, Inc., in any manner, directly or indirectly:

(a) make, effect, initiate or cause (i) any acquisition of beneficial ownership of any securities of the Company or any securities of any subsidiary or other Affiliate of the Company to the extent that such acquisition would result in Purchaser's beneficial ownership of the Company exceeding 15% of the outstanding Common Stock, (ii) any acquisition of any assets of the Company or any assets of any subsidiary or other Affiliate of the Company other than pursuant to the Collaboration Agreement or in a transaction approved by the Company's board of directors or, with respect to transactions within the authority of an officer to approve, an officer of the Company, (iii) any tender offer, exchange offer, merger, business combination, recapitalization, restructuring, liquidation, dissolution or extraordinary transaction involving the Company or any subsidiary or other Affiliate of the Company, or involving any securities or assets of the Company or any securities or assets of any subsidiary or other Affiliate of the Company or (iv) any "solicitation" of "proxies" (as those terms are used in the proxy rules of the Securities and Exchange Commission) or consents with respect to any securities of the Company; *provided*, *however*, that notwithstanding the provisions of this Section 6.3(a), if the number of shares of then outstanding Common Stock of the Company is reduced or if the ownership percentage of Purchaser is increased as a result of a repurchase by the Company of shares of Common Stock, or a stock split, stock dividend or a recapitalization of the Company, Purchaser shall not be required to dispose of its holdings of shares of the Common Stock even though such action resulted in Purchaser's beneficial ownership increasing;

(b) form, join or participate in a "group" (as defined in the Exchange Act and the rules promulgated thereunder) with respect to the beneficial ownership of any securities of the Company;

(c) act, alone or in concert with others, to seek to control or influence the management, Board of Directors or policies of the Company other than in connection with the Collaboration Agreement or work performed thereunder;

(d) take any action that would reasonably be expected to require the Company to make a public announcement regarding any of the types of matters set forth in clause "(a)" of this Section 6.3;

(e) agree or offer to take, propose or knowingly encourage (publicly or otherwise) the taking of, any action referred to in clause "(a)", "(b)", "(c)" or "(d)" of this sentence;

(f) knowingly assist, knowingly induce or knowingly encourage any other Person to take any action of the type referred to in clause "(a)", "(b)", "(c)", "(d)" or "(e)" of this sentence;

(g) enter into any discussions, negotiations, arrangement or agreement with any other Person relating to any of the foregoing; or

(h) publicly request or publicly propose that the Company amend, waive or consider the amendment or waiver of any provision set forth in this Section 6.3.

Notwithstanding the foregoing, it is understood and agreed that Purchaser shall not be prohibited from entering into an agreement and having discussions with legal, accounting or financial advisors for the limited purposes of evaluating any of the transactions contemplated by this Section 6.3, and Purchaser may initiate private discussions with, and submit proposals confidentially to, the Chief Executive Officer of the Company or the Board of Directors of the Company regarding a transaction otherwise prohibited by this Section 6.3; *provided*, *however*, that any such proposal shall be expressly conditioned on approval of the Board of Directors and shall not reasonably be expected to require public disclosure.

6.4 Antitrust Filings. Each of the Company and Purchaser, or their respective Affiliates, as applicable, shall make any required HSR Filing as promptly as practicable, but not later than ten (10) Business Days after the date hereof, in the case of the HSR Filing, in accordance with applicable Laws. In furtherance of the foregoing, the Company and Purchaser agree to:

(a) keep the other parties apprised of the status of matters relating to the completion of the Antitrust Filings;

(b) reasonably cooperate in the process to obtain antitrust clearance by the Outside Date;

(c) furnish promptly to government agencies or authorities of competent jurisdiction any information required and reasonably requested under the Merger Control Laws;

(d) furnish to another party or its counsel all information within its possession that is reasonably required for any Antitrust Filings to be made by such party in connection with the transactions contemplated by this Agreement or, as applicable, the Collaboration Agreement;

(e) promptly notify the other parties of any communications from or with any government agency or authority of competent jurisdiction to the extent relating to any Antitrust Filing or the transactions contemplated by this Agreement or, as applicable, the Collaboration Agreement;

(f) consult with the other parties in advance of participating in any meeting or substantive discussion with any government agency or authority relating to

the Antitrust Filings, and, to the extent permitted by such government agency or authority, give the other parties the opportunity to attend and participate thereat; and

(g) consult and cooperate with the other parties in connection with all analyses, appearances, presentations, memoranda, briefs, arguments, opinions and proposals made or submitted to any Governmental Authority in connection with proceedings under or relating to the Antitrust Filings.

"**Antitrust Filing**" means filings that may be required by the Company and Purchaser, or their respective Affiliates, with the United States Federal Trade Commission and the Antitrust Division of the United States Department of Justice of a Notification and Report Form for Certain Mergers and Acquisitions (as that term is defined in the HSR Act) with respect to the transactions to occur under this Agreement and/or the Collaboration Agreement, together with all required documentary attachments thereto (collectively, an "**HSR Filing**"), and any equivalent filings with foreign governmental authorities that may be required and advisable under any Merger Control Laws.

"**Business Day**" means any day except Saturday, Sunday and any legal holiday or a day on which banking institutions in Cambridge, Massachusetts or Pasadena, California generally are authorized or required by law or other governmental actions to close.

"**Merger Control Laws**" means all United States and foreign national, federal, state, and local laws, statutes, ordinances, rules, regulations, orders, treaties and decrees ("**Laws**") relating to antitrust or competition matters, or that are designed or intended to prohibit, restrict or regulate actions having the purpose or effect of monopolization or restraint of trade or lessening of competition.

6.5 Securities Laws Disclosure; Publicity. The Company shall, by 9:00 a.m. (New York City time) on or before the fourth Business Day following the date hereof, issue a press release disclosing the material terms of the transactions contemplated hereby, and shall, within four Business Days following the date hereof, file a Current Report on Form 8-K disclosing the material terms of the transactions contemplated hereby and including this a copy of the Company's press release described in this paragraph as an exhibit thereto. The Company and Purchaser shall consult with each other regarding the substance of any public disclosure by either party regarding this Agreement and regarding the issuance of any other press releases with respect to the transactions contemplated hereby, and neither the Company nor Purchaser shall issue any such press release nor otherwise make any such public statement without the prior consent of the Company, with respect to any press release of Purchaser, or without the prior consent of Purchaser, with respect to any press release of the Company, which consent shall not unreasonably be withheld or delayed, except if such disclosure is required by law, rule or regulation, in which case the disclosing party shall promptly provide the other party with prior notice of such public statement or communication.

6.6 Book Entry Statement. The Company hereby agrees to deliver to Purchaser a book entry statement from the Transfer Agent showing the Shares registered in the name of Purchaser within three Business Days of the Closing.

6.7 Government Consents and Approvals. Each party shall provide to the other (or the other's respective advisors) upon reasonable request copies of all correspondence between such party and any Governmental Authority relating to the transactions contemplated by this Agreement. The parties may, as they deem advisable and necessary, designate any competitively sensitive materials provided to the other under this Section 6.7 as "outside counsel only." Such materials and the information contained therein shall be given only to outside counsel of the recipient and will not be disclosed by such outside counsel to employees, officers, or directors of the recipient without the advance written consent of the party providing such materials.

6.8 Market Listing. From the date hereof through the Closing, the Company shall use reasonable best efforts to (a) maintain the listing and trading of the Common Stock on the Nasdaq Global Select Market and (b) effect the listing of the Shares on the Nasdaq Global Select Market, including submitting a Notification Form: Listing of Additional Shares as required by the rules of the Nasdaq Global Select Market.

6.9 Pre-Funded Warrant. At any time following the Closing, Purchaser may provide the Company with written notice of its desire to effect an exchange of Common Stock for one or more pre-funded warrants to purchase Common Stock, substantially in the form attached hereto as Exhibit B (a "**Pre-Funded Warrant**"), and the Company shall promptly thereafter effect an exchange of such shares of Common Stock for one or more Pre-Funded Warrants on an economically equivalent basis and on other customary terms and conditions for such exchanges. In such event, Purchaser and the Company shall each negotiate in good faith the documentation required for any such elected exchange.

6.10 Conduct of the Business Pending Closing. During the period from the date hereof until the Closing, except as consented to in writing by Purchaser, the Company shall (i) not declare, set aside or pay any dividend or make any other distribution or payment (whether in cash, stock or property or any combination thereof) in respect of its capital stock, (ii) not make any other actual, constructive or deemed distribution in respect of any shares of its capital stock or otherwise make any payments to stockholders in their capacity as such, except pursuant to repurchases of equity pursuant to the terms of its equity compensation plans, or (iii) not amend its Governing Documents in a manner that would adversely affect Purchaser, effect any split, combination, reclassification or similar action with respect to its capital stock or adopt or carry out any plan of complete or partial liquidation or dissolution.

7. TERMINATION

7.1 Termination. This Agreement may be terminated at any time:

(a) by the mutual written consent of Purchaser and the Company;

(b) by the Company or Purchaser upon termination of the Collaboration Agreement in accordance with its terms;

(c) by the Company or Purchaser if the Closing does not occur on or before November 25, 2025 (the "**Outside Date**"); or

(d) by either Purchaser or the Company in the event that any court of competent jurisdiction or Governmental Authority shall have issued an order, decree or ruling or taken any other action restraining, enjoining or otherwise prohibiting the actions contemplated hereby and such order, decree, ruling or other action shall have become final and non-appealable.

7.2 Effect of Termination. In the event of any termination of this Agreement as provided in Section 7.1, this Agreement shall forthwith become wholly void and of no further force and effect; *provided* that nothing herein shall relieve any party from liability for willful breach of this Agreement.

8. GENERAL

8.1 Successors and Assigns. Except as otherwise provided herein, the terms and conditions of this Agreement shall inure to the benefit of and be binding upon the respective successors and permitted assigns of the parties (including any permitted transferees of any Shares). Purchaser and the Company may not assign their respective rights or obligations under this Agreement, in whole or in part, except with the consent of the other party; *provided, however*, the rights and obligations of Purchaser may be assigned, without the prior written consent of the Company, to one or more of Purchaser's Affiliates. Any attempted assignment made in contravention of this Agreement shall be null and void and of no force or effect.

8.2 Entire Agreement. This Agreement and the documents, schedules and exhibits referred to herein or therein constitute the entire agreement between the parties and supersede all prior communications, representations, understandings and agreements of the parties with respect to the subject matter hereof and thereof. No party shall be liable or bound to any other party in any manner by any warranties, representations or covenants except as specifically set forth herein or therein. All schedules and exhibits hereto are hereby incorporated herein by reference. Nothing in this Agreement, express or implied, is intended to confer upon any third party any rights, remedies, obligations or liabilities under or by reason of this Agreement, except as expressly provided in this Agreement.

8.3 General Interpretation; Defined Terms. The terms of this Agreement have been negotiated by the parties hereto and the language used in this Agreement shall be deemed to be the language chosen by the parties hereto to express their mutual intent. This Agreement shall be construed without regard to any presumption or rule requiring construction against the party causing such instrument or any portion thereof to be drafted, or in favor of the party receiving a particular benefit under this Agreement. No rule of strict construction will be applied against any Person.

8.4 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of New York, without regard to the principles of conflicts of law thereof.

8.5 Jurisdiction. The parties hereby irrevocably and unconditionally submit to the jurisdiction of the United States District Court for the Southern District of New York for the purpose of any suit, action or other proceeding arising out of or based upon this Agreement.

8.6 Counterparts. This Agreement may be executed in any number of counterparts and by the parties hereto in separate counterparts, each of which when so executed shall be deemed to be an original and all of which taken together shall constitute one and the same agreement, and may be delivered to the other parties hereto by facsimile.

8.7 Section Headings and References. The section headings contained herein are for the convenience of the parties and in no way alter, modify, amend, limit or restrict the contractual obligations of the parties. When a reference is made in this Agreement to a Section or Exhibit, such reference is to a Section or Exhibit of or to this Agreement unless otherwise indicated. The words "hereof," "herein," "hereto" and "hereunder" and words of similar import, when used in this Agreement, shall refer to this Agreement as a whole and not to any particular provision of this Agreement. The terms defined in the singular has a comparable meaning when used in the plural, and vice versa. References to a Person are also to its successors and permitted assigns. References to an agreement are to such agreement as amended, restated, modified or otherwise supplemented, from time to time. The term "dollars" and "$" means United States dollars. The word "including" means "including without limitation" and the words "include" and "includes" have corresponding meanings.

8.8 Severability. If any term of provision of this Agreement is determined to be illegal, unenforceable or invalid in whole or in part for any reason, such illegal, unenforceable or invalid provisions or party thereof shall be stricken from this Agreement, and such provision shall not affect the legality, enforceability or validity of the remainder of this Agreement. If any provision or part thereof of this Agreement is stricken in accordance with the provisions of this Section 8.8, then such stricken provision shall be replaced, to extent possible, with a legal, enforceable and valid provision that is as similar in tenor to the stricken provision as is legally possible.

8.9 Notices. All notices and other communications given or made pursuant hereto will be in writing and will be deemed to have been duly given on the date delivered, if delivered personally, or on the next Business Day after being sent by reputable overnight courier (with delivery tracking provided, signature required, and delivery prepaid), in each case, to the Parties at the following addresses, or on the date sent and confirmed by confirmatory return email to the email address specified below or at such other address, or email address for a Party as will be specified by notice given in accordance with this Section 8.9.

If to the Company:

Arrowhead Pharmaceuticals, Inc.
117 E. Colorado Blvd., Suite 700
Pasadena, CA 91105
Attention: General Counsel
Email: General.Counsel@arrowheadpharma.com

With a copy to:

Gibson, Dunn & Crutcher LLP
One Embarcadero Center, Suite 2600

San Francisco, CA 94111
Attention: Ryan Murr
Email: rmurr@gibsondunn.com

If to Purchaser:

Sarepta Therapeutics Investments, Inc.
215 First Street
Cambridge, MA 02142
Attention: General Counsel
Email: legal@sarepta.com

With a copy to:

Ropes & Gray LLP
Prudential Tower
800 Boylston Street
Boston, MA 02199 3600
Attention: Hannah H. England
Email: Hannah.England@ropesgray.com

8.10 Amendments and Waivers. Except as otherwise expressly set forth in this Agreement, any term of this Agreement may be amended and the observance of any term of this Agreement may be waived (either generally or in a particular instance and either retroactively or prospectively), only with the written consent of each party hereto (with respect to an amendment) and the written consent of each party from whom a waiver is sought (with respect to a waiver). No waiver of any provision or consent to any action shall constitute a waiver of any other provision or consent to any other action, whether or not similar. No waiver or consent shall constitute a continuing waiver or consent or commit a party to provide a waiver in the future except to the extent specifically set forth in writing.

8.11 Expenses. Each party hereto will pay its own expenses in connection with the transactions contemplated by this Agreement.

8.12 Persons Entitled to Benefits of Agreement. This Agreement is intended for the benefit of the parties hereto and their respective permitted successors and assigns and is not for the benefit of, nor may any provision hereof be enforced by, any other person.

8.13 Further Assurances. The Company and Purchaser shall use their commercially reasonable efforts, in the most expeditious manner practicable, to satisfy or cause to be satisfied the intent and purposes of this Agreement by executing and delivering such instruments, documents and other writings as may be reasonably necessary or desirable.

[*signature pages follow*]

IN WITNESS WHEREOF, the undersigned parties have duly executed this Common Stock Purchase Agreement effective as of the date first above written.

COMPANY:

ARROWHEAD PHARMACEUTICALS, INC.

By: /s/ Christopher Anzalone, PhD
Name: Christopher Anzalone, PhD
Title: President and Chief Executive Officer

PURCHASER:

SAREPTA THERAPEUTICS INVESTMENTS, INC.

By: /s/ Joseph Bratica
Name: Joseph Bratica
Title: President

Exhibit A

Investor Rights Agreement

INVESTOR RIGHTS AGREEMENT

This Investor Rights Agreement (this "**Agreement**") is made and entered into as of [●], 2024, by and between Arrowhead Pharmaceuticals, Inc., a Delaware corporation (the "**Company**"), and Sarepta Therapeutics Investments, Inc., a Delaware corporation (the "**Purchaser**").

NOW, THEREFORE, IN CONSIDERATION of the mutual covenants contained in this Agreement, and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the Company and the Purchaser agree as follows:

DEFINITIONS

Definitions. As used in this Agreement, the following terms shall have the following meanings:

(a) "**Additional Registration Statement**" has the meaning set forth in Section 3.1.1(c).

(b) "**Adverse Disclosure**" means public disclosure of material non-public information that, in the good faith judgment of the board of directors of the Company: (i) would be required to be made in such Registration Statement filed with the SEC by the Company so that such Registration Statement, from and after its effective date, does not contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading; (ii) would not be required to be made at such time but for the filing, effectiveness or continued use of such Registration Statement; and (iii) the Company has a bona fide business purpose for not disclosing publicly.

(c) "**Affiliate**" means, with respect to any Person, another Person that controls, is controlled by or is under common control with such Person; *provided*, that with respect to the Purchaser, the term "Affiliate" shall not include any employee benefit plan of Purchaser. A Person shall be deemed to control another Person if such Person possesses, directly or indirectly, the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of voting securities, by contract or otherwise. For the purposes of this Agreement, in no event shall the Purchaser or any of its Affiliates be deemed Affiliates of the Company or any of its Affiliates, nor shall the Company or any of its Affiliates be deemed Affiliates of the Purchaser or any of its Affiliates.

(d) "**Agreement**" has the meaning set forth in the preamble.

(e) "**Board**" means the Board of Directors of the Company.

(f) "**Board Observer**" has the meaning set forth in Section 2.4.

(g) "**Board Right Termination Date**" means the earlier of (i) the date on which Purchaser, together with its Affiliates, beneficially owns less than 4.99% of the Company's outstanding Common Stock and (ii) the date on which Doug Ingram is no longer an employee of the Purchaser or its Affiliates.

(h) "**Business Day**" means any day except Saturday, Sunday and any legal holiday or a day on which banking institutions in Cambridge, Massachusetts generally are authorized or required by law or other governmental actions to close.

(i) "**Closing**" means the date of the purchase and sale of the Shares and the Pre-Funded Warrant pursuant to the Purchase Agreement.

(j) "**Collaboration Agreement**" means the Exclusive License and Collaboration Agreement by and between the Company and the Purchaser, dated as of [●], 2024.

(k) "**Common Stock**" means the common stock of the Company, par value $0.001 per share.

(l) "**Company Indemnitee**" has the meaning set forth in Section 3.8.

(m) "**Company Registration Statement**" has the meaning set forth in Section 3.2.1.

(n) "**Effectiveness Period**" has the meaning set forth in Section 3.1.3.

(o) "**Exchange Act**" means the Securities Exchange Act of 1934, as amended, as in effect from time to time.

(p) "**Filing Deadline**" has the meaning set forth in Section 3.1.1.

(q) "**FINRA**" means the Financial Industry Regulatory Authority.

(r) "**Holder**" or "**Holders**" means the Purchaser, or such other holder or holders, as the case may be, from time to time of Registrable Securities.

(s) "**Initial Registration Statement**" has the meaning set forth in Section 3.1.1(a).

(t) "**Issuer Free Writing Prospectus**" means an issuer free writing prospectus, as defined in Rule 433 under the Securities Act, relating to an offer of the Registrable Securities.

(u) "**Laws**" mean all United States and foreign national, federal, state, and local laws, statutes, ordinances, rules, regulations, orders, treaties and decrees.

(v) "**Loss**" has the meaning set forth in Section 3.7.1.

(w) "**New Registration Statement**" has the meaning set forth in Section 3.1.1.

(x) "**Permitted Transferee**" means any Affiliate of the Purchaser.

(y) "**Person**" means any individual, firm, corporation, limited liability company, partnership, company or other entity, and shall include any successor (by merger or otherwise) of such entity.

(z) "**Pre-Funded Warrant**" means any pre-funded warrant to purchase Common Stock issued to the Purchaser pursuant to Section 6.9 of the Purchase Agreement.

(aa) "**Prospectus**" means (i) the prospectus included in any Registration Statement, all amendments and supplements to such prospectus, including post-effective amendments and supplements, and all other material incorporated by reference in such prospectus, and (ii) any Issuer Free Writing Prospectus.

(bb) "**Public Offering**" means the offer and sale of Registrable Securities for cash pursuant to an effective registration statement under the Securities Act (other than a registration statement on Form S-4 or Form S-8 or any successor form).

(cc) "**Purchase Agreement**" means the Stock Purchase Agreement, by and between the Company and the Purchaser, dated as of [●], 2024.

(dd) "**Purchaser**" has the meaning set forth in the preamble.

(ee) "**Registrable Securities**" means all of (i) the Shares, (ii) the Warrant Shares, and (iii) any securities issued or issuable upon any stock split, dividend or other distribution, recapitalization or similar event with respect to the foregoing, *provided*, that with respect to a particular Holder, such Holder's Shares and Warrant Shares shall cease to be Registrable Securities upon a sale pursuant to a Registration Statement or Rule 144 under the Securities Act (in which case, only such security sold by the Holder shall cease to be a Registrable Security).

(ff) "**Registration**" means registration under the Securities Act of the offer and sale to the public of any Registrable Securities under a Registration Statement. The terms "register", "registered" and "registering" shall have correlative meanings.

(gg) "**Registration Expenses**" has the meaning set forth in Section 3.6.

(hh) "**Registration Statement**" or "**Registration Statements**" means any one or more registration statements of the Company filed under the Securities Act that covers the resale of any of the Registrable Securities pursuant to the provisions of this Agreement (including the Initial Registration Statement, the New Registration Statement and, if applicable, any Additional Registration Statement), amendments and supplements to such Registration Statements, including post-effective amendments, all exhibits and all material incorporated by reference or deemed to be incorporated by reference in such Registration Statements.

(ii) "**Representatives**" means, with respect to any Person, any of such Person's officers, directors, employees, agents, attorneys, accountants, actuaries, consultants, equity financing partners or financial advisors or other Person associated with, or acting on behalf of, such Person.

(jj) "**Rule 144**" means Rule 144 under the Securities Act (or any successor rule).

(kk) "**SEC**" means the Securities and Exchange Commission.

(ll) "**Securities Act**" means the Securities Act of 1933, as amended.

(mm) "**Selling Stockholder Information**" has the meaning set forth in Section 3.7.1.

(nn) "**Shares**" means the shares of Common Stock issued or issuable to the Purchaser pursuant to the Purchase Agreement.

(oo) "**Shelf Takedown Request**" has the meaning set forth in Section 3.1.4(a).

(pp) "**Suspension**" has the meaning set forth in Section 3.1.3.

(qq) "**Transfer**" means, with respect to any Registrable Security, any interest therein, or any other securities or equity interests relating thereto, a direct or indirect transfer, sale, exchange, assignment, pledge, hypothecation or other encumbrance or other disposition thereof, including the grant of an option or other right, whether directly or indirectly, whether voluntarily, involuntarily, by operation of law, pursuant to judicial process or otherwise. "Transferred" shall have a correlative meaning.

(rr) "**Underwritten Public Offering**" means an underwritten Public Offering, including any bought deal or block sale to a financial institution conducted as an underwritten Public Offering.

(ss) "**Underwritten Shelf Takedown**" means an Underwritten Public Offering pursuant to the Initial Registration Statement or a New Registration Statement.

(tt) "**Warrant Shares**" means the shares of Common Stock issued or issuable upon exercise of a Pre-Funded Warrant.

Construction. Whenever required by the context, any pronoun used in this Agreement shall include the corresponding masculine, feminine or neuter forms, and the singular forms of nouns, pronouns, and verbs shall include the plural and vice versa. Reference to any agreement, document, or instrument means such agreement, document, or instrument as amended or otherwise modified from time to time in accordance with the terms thereof and, if applicable, hereof. A reference to any party hereto includes such party's permitted assignees and/or the respective successors in title to substantially the whole of such party's undertaking. All references to "Sections" contained in this Agreement are, unless specifically indicated otherwise, references to sections, schedules, or exhibits of or to this Agreement. The recitals, schedules and exhibits to this Agreement form part of the operative provisions of this Agreement and references to this Agreement shall, unless the context otherwise requires, include references to the recitals to this Agreement. As used in this Agreement, the following terms shall have the meanings indicated: (a) "day" means a calendar day; (b) "U.S." or "United States" means the United States of America; (c) "dollar" or "$" means

lawful currency of the United States; (d) "including" or "include" means "including without limitation"; and (e) references in this Agreement to specific laws includes the succeeding law, section, or provision corresponding thereto and the rules and regulations promulgated thereunder.

BOARD RIGHTS

Appointment of Director. The Board shall appoint Doug Ingram to be a member of the Board effective as of the Closing. Until the Board Right Termination Date, at the end of each of Mr. Ingram's terms as a member of the Board, provided that Mr. Ingram continues to meet legal, regulatory and stock market requirements to serve as a member of the Board, the Company shall cause Mr. Ingram to be nominated for re-election as a director as part of the slate proposed by the Board that is included in the proxy statement (or consent solicitation or similar document) of the Company relating to the election of the Board, and the Company will use all commercially reasonable efforts to cause the election of Mr. Ingram to the Board, including providing the same level of support as is provided for other nominees of the Company to the Board.

Expenses and Policies. The Company shall compensate and reimburse the expenses of Mr. Ingram consistent with the Company's policies on business expense reimbursement and shall indemnify him and provide him with director and officer liability insurance to the same extent it indemnifies and provides insurance for the other non-employee members of the Board pursuant to its organizational documents, applicable law or otherwise.

Board Observer. If, prior to the date on which Purchaser, together with its Affiliates, beneficially owns less than 4.99% of the Company's outstanding Common Stock, Mr. Ingram is no longer an employee of Purchaser, Purchaser shall have the right to appoint one individual as a non-voting observer to the Board (the "**Board Observer**"), and the Board Observer shall be entitled to attend meetings of the Board and to receive all information provided to the members of the Board; *provided*, *however*, that the Company reserves the right to withhold any information and to exclude the Board Observer from any meeting or portion thereof if the Board determines in good faith and based upon the advice of counsel that access to such information or attendance at such meeting would reasonably be expected to (a) adversely affect the attorney-client privilege between the Company and its counsel or (b) result in a conflict of interest. The Board Observer shall have such rights until the earlier of (x) such time as when the Purchaser, together with its Affiliates, beneficially owns less than 4.99% of the Company's outstanding Common Stock and (y) January 1, 2030. The Company and the Board Observer shall enter into a board observer agreement in form and substance to be mutually agreed upon between the Company and the Purchaser at the time the Board Observer is appointed pursuant to this Section 2.3.

Information Rights. During such time that Mr. Ingram is a member of the Company's Board of Directors or the Purchaser has a right to appoint a Board Observer pursuant to Section 2.3, the Purchaser and its Affiliates will be entitled to receive any information that Mr. Ingram or the Board Observer receives or is entitled to receive; *provided*, *however*, that the Purchaser and its Affiliates may make such information available only to individuals who have a need to know such information for purposes of the Collaboration Agreement or the Purchaser's or any Affiliate's investment in the Company, including any outside service providers subject to a duty of

confidentiality to the Purchaser or any Affiliate, such as auditors and legal counsel; *provided*, *further*, that the Company reserves the right to withhold any information or portion thereof from the Purchaser and its Affiliates if the Board determines in good faith and based upon the advice of counsel, that access to such information or attendance at such meeting would reasonably be expected to (a) adversely affect the attorney-client privilege between the Company and its counsel or (b) result in a conflict of interest.

REGISTRATION RIGHTS

The Company will perform and comply, and cause each of its subsidiaries to perform and comply, with such of the following provisions as are applicable to it. Each Holder will perform and comply with such of the following provisions as are applicable to such Holder.

Registration.

Request for Registration.

As promptly as possible, and in any event within thirty (30) calendar days of the Closing (the "**Filing Deadline**"), the Company shall file with the SEC a shelf Registration Statement pursuant to Rule 415 under the Securities Act or, if Rule 415 is not available for offers and sales of the Registrable Securities, by such other means of distribution of Registrable Securities as the Holders may reasonably specify (the "**Initial Registration Statement**"), relating to the offer and sale of Registrable Securities by any Holders thereof from time to time in accordance with the methods of distribution elected by such Holders, and the Company shall use its reasonable best efforts to cause the Initial Registration Statement to promptly become effective under the Securities Act, *provided*, *however*, that the Company shall be permitted to file a post-effective amendment or Prospectus supplement to any effective shelf Registration Statement in lieu of filing a new Registration Statement to the extent the Company determines, and the Holders agree, that the Registrable Securities may be sold thereunder by the Holders pursuant to their intended plan of distribution.

Notwithstanding the registration obligations set forth in this Section 3.1.1, in the event the SEC informs the Company that all of the Registrable Securities cannot, as a result of the application of Rule 415, be registered for resale as a secondary offering on a single registration statement, the Company agrees to promptly (i) inform each of the Holders thereof and use its commercially reasonable efforts to file amendments to the Initial Registration Statement as required by the SEC and/or (ii) withdraw the Initial Registration Statement and file a new registration statement (a "**New Registration Statement**"), in either case covering the maximum number of Registrable Securities permitted to be registered by the SEC, on Form S-3 or such other form available to register for resale the Registrable Securities as a secondary offering; *provided, however*, that prior to filing such amendment or New Registration Statement, the Company shall be obligated to use its commercially reasonable efforts to advocate with the SEC for the registration of all of the Registrable Securities. Notwithstanding any other provision of this Agreement, if the SEC limits the number of Registrable Securities permitted to be registered on a particular Registration Statement as a secondary offering (and notwithstanding that the Company

used diligent efforts to advocate with the SEC for the registration of all or a greater number of Registrable Securities), unless otherwise directed in writing by a Holder as to its Registrable Securities, the number of Registrable Securities to be registered on such Registration Statement will be reduced: first by Registrable Securities not acquired pursuant to the Purchase Agreement (whether pursuant to registration rights or otherwise); second by Registrable Securities represented by the Pre-Funded Warrant; and third by Registrable Securities represented by Shares. In the event the Company amends the Initial Registration Statement or files a New Registration Statement, as the case may be, under clauses (i) or (ii) above, the Company will use its commercially reasonable efforts to file with the SEC, as promptly as allowed by SEC, one or more registration statements on Form S-3 or such other form available to register for resale those Registrable Securities that were not registered for resale on the Initial Registration Statement, as amended, or the New Registration Statement.

As promptly as possible, and in any event within thirty (30) calendar days of the issuance of any Pre-Funded Warrant pursuant to Section 6.9 of the Purchase Agreement, the Company shall file with the SEC a shelf Registration Statement pursuant to Rule 415 under the Securities Act or, if Rule 415 is not available for offers and sales of the Registrable Securities, by such other means of distribution of Registrable Securities as the Holders may reasonably specify (an "**Additional Registration Statement**"), relating to the offer and sale of Registrable Securities underlying such Pre-Funded Warrant by any Holders thereof from time to time in accordance with the methods of distribution elected by such Holders, and the Company shall use its reasonable best efforts to cause the Additional Registration Statement to promptly become effective under the Securities Act, provided, however, that the Company shall be permitted to file a post-effective amendment or Prospectus supplement to any effective shelf Registration Statement in lieu of filing an Additional Registration Statement to the extent the Company determines, and the Holders agree, that the Registrable Securities may be sold thereunder by the Holders pursuant to their intended plan of distribution.

Continued Effectiveness. The Company shall use its reasonable best efforts to keep such Registration Statement continuously effective under the Securities Act in order to permit the Prospectus forming part of the Registration Statement to be usable by Holders until the date as of which no Holder holds Registrable Securities (such period of effectiveness, the "**Effectiveness Period**"). Subject to Section 3.1.3, the Company shall be deemed not to have used its reasonable best efforts to keep the Registration Statement effective during the Effectiveness Period if the Company voluntarily takes any action or omits to take any action that would result in Holders of the Registrable Securities covered thereby not being able to offer and sell any Registrable Securities pursuant to such Registration Statement during the Effectiveness Period, unless such action or omission is required by applicable law.

Suspension of Registration. If the continued use of such Registration Statement at any time would require the Company to make an Adverse Disclosure, the Company may, upon giving prompt written notice of such action to the Holders, suspend use of the Registration Statement (a "**Suspension**"); *provided, however*, that the Company shall not be permitted to exercise a Suspension more than one time during any twelve (12)-month period for a period not to exceed sixty (60) days. In the case of a Suspension, the Holders agree to suspend use of the applicable Prospectus in connection with any sale or purchase of, or offer to sell or purchase, Registrable Securities, upon receipt of the notice referred to above. The Company shall

immediately notify the Holders in writing upon the termination of any Suspension, amend or supplement the Prospectus, if necessary, so it does not contain any untrue statement or omission and furnish to the Holders such numbers of copies of the Prospectus as so amended or supplemented as the Holders may reasonably request. The Company shall, if necessary, supplement or amend the Registration Statement, if required by the registration form used by the Company for the Registration Statement or by the instructions applicable to such registration form or by the Securities Act or the rules or regulations promulgated thereunder or as may reasonably be requested by the Holders of a majority of Registrable Securities that are included in such Registration Statement.

Shelf Takedown. During the Effectiveness Period, by notice to the Company specifying the intended method or methods of disposition thereof, the Purchaser may make a written request (a "**Shelf Takedown Request**") to the Company to effect a Public Offering, including an Underwritten Shelf Takedown, of all or a portion of the Registrable Securities that may be registered under such Registration Statement, and as soon as practicable the Company shall amend or supplement the Registration Statement as necessary for such purpose.

Statutory Underwriters. Notwithstanding anything to the contrary contained herein, in no event shall the Company be permitted to name any Holder or affiliate of a Holder as an underwriter without the prior written consent of such Holder. In no event shall any Holder be identified as a statutory underwriter in any Registration Statement; *provided, however*, that if the Commission requests that a Holder be identified as a statutory underwriter in the Registration Statement, such Holder will have an opportunity to withdraw from the Registration Statement.

Registration Procedures.

Requirements. In connection with the Company's obligations under Section 3.1, the Company shall use its reasonable best efforts to effect such Registration and to permit the sale of such Registrable Securities in accordance with the intended method or methods of distribution thereof as expeditiously as reasonably practicable, and in connection therewith the Company shall:

Before filing a Registration Statement or Prospectus or any amendments or supplements thereto, (x) furnish to the underwriters, if any, and to the Holders of the Registrable Securities covered by such Registration Statement, copies of all documents prepared to be filed, which documents shall be subject to the review of such underwriters and such Holders and their respective counsel and (y) make such changes in such documents concerning the Holders prior to the filing thereof as such Holders, or their counsel, may reasonably request;

prepare and file with the SEC such amendments and post-effective amendments to such Registration Statement and supplements to the Prospectus as may be (x) reasonably requested by any Holder with Registrable Securities covered by such Registration Statement, (y) reasonably requested by any participating Holder (to the extent such request relates to information relating to such Holder), or (z) necessary to keep such Registration Statement effective during the Effectiveness Period, and comply with provisions of the applicable securities laws with respect to the sale or other disposition of all securities covered by such Registration Statement during such period in accordance with the intended method or methods of disposition by the sellers thereof set forth in such Registration Statement;

notify the participating Holders and the managing underwriter or underwriters, if any, and (if requested) confirm such notice in writing and provide copies of the relevant documents, as soon as reasonably practicable after notice thereof is received by the Company (a) when the applicable Registration Statement or any amendment thereto has been filed or becomes effective, and when the applicable Prospectus or any amendment or supplement thereto has been filed, (b) of any written comments by the SEC, or any request by the SEC or other federal or state governmental authority for amendments or supplements to such Registration Statement or such Prospectus, or for additional information (whether before or after the effective date of the Registration Statement) or any other correspondence with the SEC relating to, or which may affect, the Registration, (c) of the issuance by the SEC of any stop order suspending the effectiveness of such Registration Statement or any order by the SEC or any other regulatory authority preventing or suspending the use of any preliminary or final Prospectus or the initiation or threatening of any proceedings for such purposes, (d) if, at any time, the representations and warranties of the Company in any applicable underwriting agreement cease to be true and correct in all material respects and (e) of the receipt by the Company of any notification with respect to the suspension of the qualification of the Registrable Securities for offering or sale in any jurisdiction or the initiation or threatening of any proceeding for such purpose;

promptly notify each selling Holder and the managing underwriter or underwriters, if any, when the Company becomes aware of the happening of any event as a result of which the applicable Registration Statement or the Prospectus included in such Registration Statement contains any untrue statement of a material fact or omits to state a material fact necessary to make the statements therein (in the case of such Prospectus or any preliminary Prospectus, in light of the circumstances under which they were made) not misleading, when any Issuer Free Writing Prospectus includes information that may conflict with the information contained in the Registration Statement, or, if for any other reason it shall be necessary during such time period to amend or supplement such Registration Statement or Prospectus in order to comply with the Securities Act and, as promptly as reasonably practicable thereafter, prepare and file with the SEC, and furnish without charge to the selling Holders and the managing underwriter or underwriters, if any, an amendment or supplement to such Registration Statement or Prospectus, which shall correct such misstatement or omission or effect such compliance;

to the extent the Company is eligible under the relevant provisions of Rule 430B under the Securities Act, the Company shall include in the applicable Registration Statement such disclosures as may be required by Rule 430B under the Securities Act (referring to the unnamed selling security holders in a generic manner by identifying the initial offering of the securities to the Holders) in order to ensure that the Holders may be added to such Registration Statement at a later time through the filing of a Prospectus supplement rather than a post-effective amendment;

use its reasonable best efforts to prevent, or obtain the withdrawal of, any stop order or other order or notice preventing or suspending the use of any preliminary or final Prospectus;

promptly incorporate in a Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment such information as the managing underwriter or underwriters and the Purchaser agree should be included therein relating to the plan of distribution with respect to such Registrable Securities; and make all required filings of such Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment as soon as reasonably practicable after being

notified of the matters to be incorporated in such Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment;

furnish to each selling Holder and each underwriter, if any, without charge, as many conformed copies as such Holder or underwriter may reasonably request of the applicable Registration Statement and any amendment or post-effective amendment or supplement thereto, including financial statements and schedules, all documents incorporated therein by reference and all exhibits (including those incorporated by reference);

deliver to each selling Holder and each underwriter, if any, without charge, as many copies of the applicable Prospectus (including each preliminary Prospectus) and any amendment or supplement thereto and such other documents as such Holder or underwriter may reasonably request in order to facilitate the disposition of the Registrable Securities by such Holder or underwriter (it being understood that the Company shall consent to the use of such Prospectus or any amendment or supplement thereto by each of the selling Holders and the underwriters, if any, in connection with the offering and sale of the Registrable Securities covered by such Prospectus or any amendment or supplement thereto);

on or prior to the date on which the applicable Registration Statement becomes effective, use its reasonable best efforts to register or qualify in connection with the Registration or qualification of such Registrable Securities for offer and sale under the securities or "Blue Sky" laws of each state and other jurisdiction as any such selling Holder or managing underwriter or underwriters, if any, or their respective counsel reasonably request in writing and do any and all other acts or things reasonably necessary or advisable to keep such Registration or qualification in effect for the Effectiveness Period, *provided* that the Company shall not be required to qualify generally to do business in any jurisdiction where it is not then so qualified or to take any action which would subject it to taxation or general service of process in any such jurisdiction where it is not then so subject;

cooperate with the selling Holders and the managing underwriter or underwriters, if any, to facilitate the timely preparation and delivery of certificates representing Registrable Securities to be sold and not bearing any restrictive legends and enable such Registrable Securities to be in such denominations and registered in such names as the managing underwriters may request prior to any sale of Registrable Securities to the underwriters;

use its reasonable best efforts to cause the Registrable Securities covered by the applicable Registration Statement to be registered with or approved by such other governmental agencies or authorities as may be necessary to enable the seller or sellers thereof or the underwriter or underwriters, if any, to consummate the disposition of such Registrable Securities;

make such representations and warranties to the Holders being registered, and the underwriters or agents, if any, in form, substance and scope as are customarily made by issuers in public offerings similar to the offering then being undertaken;

enter into such customary agreements (including underwriting and indemnification agreements) and take all such other actions as the Purchaser or the managing underwriter or underwriters, if any, reasonably request in order to expedite or facilitate the Registration and

disposition of such Registrable Securities;

obtain for delivery to the Holders and to the underwriter or underwriters, if any, an opinion or opinions from counsel for the Company dated the most recent effective date of the Registration Statement or, in the event of an Underwritten Public Offering, the date of the closing under the underwriting agreement, in customary form, scope and substance, which opinions shall be reasonably satisfactory to such Holders or underwriters, as the case may be, and their respective counsel;

in the case of an Underwritten Public Offering, obtain for delivery to the Company and the managing underwriter or underwriters, with copies to the Holders included in such Registration or sale, a comfort letter from the Company's independent certified public accountants or independent auditors (and, if necessary, any other independent certified public accountants or independent auditors of any subsidiary of the Company or any business acquired by the Company for which financial statements and financial data are, or are required to be, included in the Registration Statement) in customary form and covering such matters of the type customarily covered by comfort letters as the managing underwriter or underwriters reasonably request, dated the date of execution of the underwriting agreement and brought down to the closing under the underwriting agreement;

cooperate with each seller of Registrable Securities and each underwriter, if any, participating in the disposition of such Registrable Securities and their respective counsel in connection with any filings required to be made with FINRA;

provide and cause to be maintained a transfer agent and registrar for all Registrable Securities covered by the applicable Registration Statement;

use its reasonable best efforts to cause all Registrable Securities covered by the applicable Registration Statement to be listed on each securities exchange on which any of the Company's equity securities are then listed or quoted and on each inter-dealer quotation system on which any of the Company's equity securities are then quoted;

make available upon reasonable notice at reasonable times and for reasonable periods for inspection by the Purchaser, by any underwriter participating in any disposition to be effected pursuant to such Registration Statement and by any attorney, accountant or other agent retained by the Purchaser or any such underwriter, all pertinent financial and other records and pertinent corporate documents and properties of the Company, and cause all of the Company's officers, directors and employees and the independent public accountants who have certified its financial statements to make themselves available to discuss the business of the Company and to supply all information reasonably requested by any such Person in connection with such Registration Statement;

in the case of an Underwritten Public Offering, cause the senior executive officers of the Company to participate in the customary "road show" presentations that may be reasonably requested by the managing underwriter or underwriters in any such offering and otherwise to facilitate, cooperate with, and participate in each proposed offering contemplated herein and customary selling efforts related thereto;

take no direct or indirect action prohibited by Regulation M under the Exchange Act;

take all reasonable action to ensure that any Issuer Free Writing Prospectus utilized in connection with any Registration complies in all material respects with the Securities Act, is filed in accordance with the Securities Act to the extent required thereby, is retained in accordance with the Securities Act to the extent required thereby and, when taken together with the related Prospectus, will not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements therein, in light of the circumstances under which they were made, not misleading; and

take all such other commercially reasonable actions as are necessary or advisable in order to expedite or facilitate the disposition of such Registrable Securities in accordance with the terms of this Agreement.

Company Information Requests. The Company may require each seller of Registrable Securities as to which any Registration or sale is being effected to furnish to the Company such information regarding the distribution of such securities and such other information relating to such Holder and its ownership of Registrable Securities as the Company may from time to time reasonably request in writing. Each Holder agrees to furnish such information to the Company and to cooperate with the Company as reasonably necessary to enable the Company to comply with the provisions of this Agreement.

Discontinuing Registration. Each Holder agrees that, upon receipt of any notice from the Company of the happening of any event of the kind described in Section 3.2.1(d), such Holder will discontinue disposition of Registrable Securities pursuant to such Registration Statement until such Holder's receipt of the copies of the supplemented or amended Prospectus contemplated by Section 3.2.1(d), or until such Holder is advised in writing by the Company that the use of the Prospectus may be resumed, and has received copies of any additional or supplemental filings that are incorporated by reference in the Prospectus, or any amendments or supplements thereto, and if so directed by the Company, such Holder shall deliver to the Company (at the Company's expense) all copies, other than permanent file copies then in such Holder's possession, of the Prospectus covering such Registrable Securities current at the time of receipt of such notice.

Underwritten Offerings.

Shelf Registrations. If requested by the underwriters for any Underwritten Shelf Takedown, pursuant to a Registration or sale under Section 3.1, the Company shall enter into an underwriting agreement with such underwriters, such agreement to be reasonably satisfactory in substance and form to each of the Company, the Purchaser and the underwriters, and to contain such representations and warranties by the Company and such other terms as are generally prevailing in agreements of that type, including indemnities no less favorable to the recipient thereof than those provided in Section 3.6 of this Agreement. The Holders of the Registrable Securities proposed to be distributed by such underwriters shall cooperate with the Company in the negotiation of the underwriting agreement and shall give consideration to the reasonable suggestions of the Company regarding the form thereof, and such Holders shall complete and

execute all questionnaires, powers of attorney and other documents reasonably requested by the underwriters and required under the terms of such underwriting arrangements. Any such Holder shall not be required to make any representations or warranties to or agreements with the Company or the underwriters other than representations, warranties or agreements regarding such Holder, such Holder's title to the Registrable Securities, such Holder's intended method of distribution and any other representations to be made by the Holder as are generally prevailing in agreements of that type, and the aggregate amount of the liability of such Holder under such agreement shall not exceed such Holder's proceeds from the sale of its Registrable Securities in the offering, net of underwriting discounts and commissions but before expenses.

Selection of Underwriters; Selection of Counsel. In the case of an Underwritten Shelf Takedown under Section 3.1, the managing underwriter or underwriters to administer the offering shall be determined by the Purchaser and counsel to the Holders shall be Ropes & Gray LLP unless otherwise agreed by the Company and the Purchaser.

No Inconsistent Agreements; Additional Rights. Neither the Company nor any of its subsidiaries shall hereafter enter into, and neither the Company nor any of its subsidiaries is currently a party to, any agreement with respect to its securities that is inconsistent with the rights granted to the Holders by this Agreement. The Company hereby represents and warrants that, as of the date hereof, no registration or similar rights have been granted to any other Person other than pursuant to this Agreement.

Registration Expenses. All expenses incident to the Company's performance of or compliance with this Agreement shall be paid by the Company, including (i) all registration and filing fees, and any other fees and expenses associated with filings required to be made with the SEC or FINRA, (ii) all fees and expenses in connection with compliance with any securities or "Blue Sky" laws (including reasonable fees and disbursements of counsel for the underwriters in connection with blue sky qualifications of the Registrable Securities), (iii) all printing, duplicating, word processing, messenger, telephone, facsimile and delivery expenses (including expenses of printing certificates for the Registrable Securities in a form eligible for deposit with The Depository Trust Company and of printing Prospectuses), (iv) all fees and disbursements of counsel for the Company and of all independent certified public accountants or independent auditors of the Company and any subsidiaries of the Company (including the expenses of any special audit and comfort letters required by or incident to such performance), (v) Securities Act liability insurance or similar insurance if the Company so desires or the underwriters so require in accordance with then-customary underwriting practice, (vi) all fees and expenses incurred in connection with the listing of the Registrable Securities on any securities exchange or quotation of the Registrable Securities on any inter-dealer quotation system, (viii) all reasonable fees and disbursements of one legal counsel for the selling Holders, (ix) any reasonable fees and disbursements of underwriters customarily paid by issuers or sellers of securities, (x) all fees and expenses incurred in connection with the distribution or Transfer of Registrable Securities to or by a Holder or its Permitted Transferees in connection with a Public Offering, (xi) all fees and expenses of any special experts or other Persons retained by the Company in connection with any Registration or sale, (xii) all of the Company's internal expenses (including all salaries and expenses of its officers and employees performing legal or accounting duties) and (xiii) all expenses related to the "road show" for any Underwritten Public Offering, including the reasonable out-of-pocket expenses of the Holders and underwriters, if so requested. All such

expenses are referred to herein as "**Registration Expenses**". The Company shall not be required to pay any fees and disbursements to underwriters not customarily paid by the issuers of securities in an offering similar to the applicable offering, including underwriting discounts and commissions and transfer taxes, if any, attributable to the sale of Registrable Securities.

Indemnification.

Indemnification by the Company. The Company shall indemnify and hold harmless, to the full extent permitted by law, each Holder, each shareholder, member, limited or general partner of such Holder, each shareholder, member, limited or general partner of each such shareholder, member, limited or general partner, each of their respective Affiliates, officers, directors, shareholders, employees, advisors, and agents and each Person who controls (within the meaning of the Securities Act or the Exchange Act) such Persons and each of their respective Representatives from and against any and all losses, penalties, judgments, suits, costs, claims, damages, liabilities and expenses, joint or several (including reasonable costs of investigation and legal expenses and any indemnity and contribution payments made to underwriters) (each, a "**Loss**" and collectively "**Losses**") arising out of or based upon (i) any untrue or alleged untrue statement of a material fact contained in any Registration Statement under which such Registrable Securities are registered or sold under the Securities Act (including any final, preliminary or summary Prospectus contained therein or any amendment thereof or supplement thereto or any documents incorporated by reference therein) or any other disclosure document produced by or on behalf of the Company or any of its subsidiaries including any report and other document filed under the Exchange Act, (ii) any omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein (in the case of a Prospectus or preliminary Prospectus, in light of the circumstances under which they were made) not misleading or (iii) any violation or alleged violation by the Company or any of its subsidiaries of any federal, state, foreign or common law rule or regulation applicable to the Company or any of its subsidiaries and relating to action or inaction in connection with any such registration, disclosure document or other document or report; *provided*, that no selling Holder shall be entitled to indemnification pursuant to this Section 3.6.1 in respect of any untrue statement or omission contained in any information relating to such seller Holder furnished in writing by such selling Holder to the Company specifically for inclusion in a Registration Statement and used by the Company in conformity therewith (such information "**Selling Stockholder Information**"). This indemnity shall be in addition to any liability the Company may otherwise have. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of such Holder or any indemnified party and shall survive the Transfer of such securities by such Holder and regardless of any indemnity agreed to in the underwriting agreement that is less favorable to the Holders. The Company shall also indemnify underwriters, selling brokers, dealer managers and similar securities industry professionals participating in the distribution, their officers and directors and each Person who controls such Persons (within the meaning of the Securities Act and the Exchange Act) to the same extent as provided above (with appropriate modification) with respect to the indemnification of the indemnified parties.

Indemnification by the Selling Holders. Each selling Holder agrees (severally and not jointly) to indemnify and hold harmless, to the fullest extent permitted by law, the Company, its directors and officers and each Person who controls the Company (within the meaning of the Securities Act or the Exchange Act) from and against any Losses resulting from (i) any untrue

statement of a material fact in any Registration Statement under which such Registrable Securities were registered or sold under the Securities Act (including any final, preliminary or summary Prospectus contained therein or any amendment thereof or supplement thereto or any documents incorporated by reference therein) or (ii) any omission to state therein a material fact required to be stated therein or necessary to make the statements therein (in the case of a Prospectus or preliminary Prospectus, in light of the circumstances under which they were made) not misleading, in each case to the extent, but only to the extent, that such untrue statement or omission is contained in such selling Holder's Selling Stockholder Information. In no event shall the liability of any selling Holder hereunder be greater in amount than the dollar amount of the proceeds from the sale of its Registrable Securities in the offering giving rise to such indemnification obligation, net of underwriting discounts and commissions but before expenses, less any amounts paid by such Holder pursuant to Section 3.6.4 and any amounts paid by such Holder as a result of liabilities incurred under the underwriting agreement, if any, related to such sale.

Conduct of Indemnification Proceedings. Any Person entitled to indemnification hereunder shall (i) give prompt written notice to the indemnifying party of any claim with respect to which it seeks indemnification (provided that any delay or failure to so notify the indemnifying party shall relieve the indemnifying party of its obligations hereunder only to the extent, if at all, that it forfeits substantive legal rights by reason of such delay or failure) and (ii) permit such indemnifying party to assume the defense of such claim with counsel reasonably satisfactory to the indemnified party; *provided, however*, that any Person entitled to indemnification hereunder shall have the right to select and employ separate counsel and to participate in the defense of such claim, but the fees and expenses of such counsel shall be at the expense of such Person unless (i) the indemnifying party has agreed in writing to pay such fees or expenses, (ii) the indemnifying party shall have failed to assume the defense of such claim within a reasonable time after receipt of notice of such claim from the Person entitled to indemnification hereunder and employ counsel reasonably satisfactory to such Person, (iii) the indemnified party has reasonably concluded (based upon advice of its counsel) that there may be legal defenses available to it or other indemnified parties that are different from or in addition to those available to the indemnifying party, or (iv) in the reasonable judgment of any such Person (based upon advice of its counsel) a conflict of interest may exist between such Person and the indemnifying party with respect to such claims (in which case, if the Person notifies the indemnifying party in writing that such Person elects to employ separate counsel at the expense of the indemnifying party, the indemnifying party shall not have the right to assume the defense of such claim on behalf of such Person). If the indemnifying party assumes the defense, the indemnifying party shall not have the right to settle such action without the consent of the indemnified party. No indemnifying party shall consent to entry of any judgment or enter into any settlement which does not include as an unconditional term thereof the giving by the claimant or plaintiff to such indemnified party of an unconditional release from all liability in respect to such claim or litigation without the prior written consent of such indemnified party. If such defense is not assumed by the indemnifying party, the indemnifying party will not be subject to any liability for any settlement made without its prior written consent, but such consent may not be unreasonably withheld. It is understood that the indemnifying party or parties shall not, except as specifically set forth in this Section 3.6.3, in connection with any proceeding or related proceedings in the same jurisdiction, be liable for the reasonable fees, disbursements or other charges of more than one separate firm admitted to practice in such jurisdiction at any one time unless (x) the employment of more than one counsel has been authorized in writing by the indemnifying party or parties, (y) an indemnified party has reasonably concluded (based on the

advice of counsel) that there may be legal defenses available to it that are different from or in addition to those available to the other indemnified parties or (z) a conflict or potential conflict exists or may exist (based upon advice of counsel to an indemnified party) between such indemnified party and the other indemnified parties, in each of which cases the indemnifying party shall be obligated to pay the reasonable fees and expenses of such additional counsel or counsels.

Contribution. If for any reason the indemnification provided for in Section 3.6.1 and Section 3.6.2 is unavailable to an indemnified party or insufficient in respect of any Losses referred to therein (other than as a result of exceptions or limitations on indemnification contained in Section 3.6.1 and Section 3.6.2), then the indemnifying party shall contribute to the amount paid or payable by the indemnified party as a result of such Loss in such proportion as is appropriate to reflect the relative fault of the indemnifying party on the one hand and the indemnified party or parties on the other hand in connection with the acts, statements or omissions that resulted in such Losses, as well as any other relevant equitable considerations. In connection with any Registration Statement filed with the SEC by the Company, the relative fault of the indemnifying party on the one hand and the indemnified party on the other hand shall be determined by reference to, among other things, whether any untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the indemnifying party or by the indemnified party and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission. The parties hereto agree that it would not be just or equitable if contribution pursuant to this Section 3.6.4 were determined by pro rata allocation or by any other method of allocation that does not take account of the equitable considerations referred to in this Section 3.6.4. No Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation. The amount paid or payable by an indemnified party as a result of the Losses referred to in Sections 3.6.1 and 3.6.2 shall be deemed to include, subject to the limitations set forth above, any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending any such action or claim. Notwithstanding the provisions of this Section 3.6.4, in connection with any Registration Statement filed by the Company, a selling Holder shall not be required to contribute any amount in excess of the dollar amount of the proceeds from the sale of its Registrable Securities in the offering giving rise to such indemnification obligation, net of underwriting discounts and commissions but before expenses, less any amounts paid by such Holder pursuant to Section 3.6.2 and any amounts paid by such Holder as a result of liabilities incurred under the underwriting agreement, if any, related to such sale. If indemnification is available under this Section 3.6, the indemnifying parties shall indemnify each indemnified party to the full extent provided in Sections 3.6.1 and 3.6.2 hereof without regard to the provisions of this Section 3.6.4. The remedies provided for in this Section 3.6 are not exclusive and shall not limit any rights or remedies which may otherwise be available to any indemnified party at law or in equity.

Indemnification Priority. The Company hereby acknowledges and agrees that any of the Persons entitled to indemnification pursuant to Section 3.6.1 (each, a "**Company Indemnitee**" and collectively, the "**Company Indemnitees**") may have certain rights to indemnification, advancement of expenses and/or insurance provided by other sources. The Company hereby acknowledges and agrees (i) that it is the indemnitor of first resort (i.e., its obligations to a Company Indemnitee are primary and any obligation of such other sources to advance expenses or to provide indemnification for the same expenses or liabilities incurred by such Company

Indemnitee are secondary) and (ii) that it shall be required to advance the full amount of expenses incurred by a Company Indemnitee and shall be liable for the full amount of all expenses, judgments, penalties, fines and amounts paid in settlement to the extent legally permitted and as required by the terms of this Agreement without regard to any rights a Company Indemnitee may have against such other sources. The Company further agrees that no advancement or payment by such other sources on behalf of a Company Indemnitee with respect to any claim for which such Company Indemnitee has sought indemnification, advancement of expenses or insurance from the Company shall affect the foregoing, and that such other sources shall have a right of contribution and/or be subrogated to the extent of such advancement or payment to all of the rights of recovery of such Company Indemnitee against the Company.

Rules 144 and 144A and Regulation S. The Company shall file the reports required to be filed by it under the Securities Act and the Exchange Act and the rules and regulations adopted by the SEC thereunder (or, if the Company is not required to file such reports, it will, upon the request of any Holder, make publicly available such necessary information for so long as necessary to permit sales that would otherwise be permitted by this Agreement pursuant to Rule 144, Rule 144A or Regulation S under the Securities Act, as such rules may be amended from time to time or any similar rule or regulation hereafter adopted by the SEC), and it will take such further action as any Holder may reasonably request, all to the extent required from time to time to enable such Holder to sell Registrable Securities without Registration under the Securities Act in transactions that would otherwise be permitted by this Agreement and within the limitation of the exemptions provided by (i) Rule 144, Rule 144A or Regulation S under the Securities Act, as such rules may be amended from time to time, or (ii) any similar rule or regulation hereafter adopted by the SEC. Upon the request of any Holder, the Company will deliver to such Holder a written statement as to whether it has complied with such requirements and, if not, the specifics thereof.

Existing Registration Statements. Notwithstanding anything herein to the contrary and subject to applicable law and regulation, the Company may satisfy any obligation hereunder to file a Registration Statement or to have a Registration Statement become effective by a specified date by designating, by notice to the Holders, a Registration Statement that previously has been filed with the SEC or become effective, as the case may be, as the relevant Registration Statement for purposes of satisfying such obligation, and all references to any such obligation shall be construed accordingly; *provided,* that such previously filed Registration Statement may be, and is, amended or, subject to applicable securities laws, supplemented to add the number of Registrable Securities, and, to the extent necessary, to identify as selling stockholders those Holders demanding the filing of a Registration Statement pursuant to the terms of this Agreement. To the extent this Agreement refers to the filing or effectiveness of other Registration Statements, by or at a specified time and the Company has, in lieu of then filing such Registration Statements or having such Registration Statements become effective, designated a previously filed or effective Registration Statement as the relevant Registration Statement for such purposes, in accordance with the preceding sentence, such references shall be construed to refer to such designated Registration Statement, as amended or supplemented in the manner contemplated by the immediately preceding sentence.

MISCELLANEOUS

Termination and Effect of Termination. This Agreement shall terminate upon the date on which no Holder holds any Registrable Securities, except for the provisions of Sections 3.6 and 3.7, which shall survive any such termination. No termination under this Agreement shall relieve any Person of liability for breach or Registration Expenses incurred prior to termination. In the event this Agreement is terminated, each Person entitled to indemnification rights pursuant to Section 3.6 hereof shall retain such indemnification rights with respect to any matter that (i) may be an indemnified liability thereunder and (ii) occurred prior to such termination.

Permitted Transferees; Assignment. The rights of a Holder hereunder may be assigned (but only with all related obligations as set forth below) in connection with a Transfer of Registrable Securities to a Permitted Transferee of that Holder. Without prejudice to any other or similar conditions imposed hereunder with respect to any such Transfer, no assignment permitted under the terms of this Section 4.2 will be effective unless the Permitted Transferee to which the assignment is being made, if not a Holder, has delivered to the Company a written acknowledgment and agreement in form and substance reasonably satisfactory to the Company that the Permitted Transferee will be bound by, and will be a party to, this Agreement. A Permitted Transferee to whom rights are transferred pursuant to this Section 4.2 may not again transfer those rights to any other Permitted Transferee, other than as provided in this Section 4.2. The Company may not assign its rights (except by merger or in connection with another entity acquiring all or substantially all of the Company's assets) or obligations hereunder without the prior written consent of all the Holders of the then outstanding Registrable Securities.

Governing Law. This Agreement and all claims or causes of action (whether in tort, contract or otherwise) that may be based upon, arise out of or relate to this Agreement or the negotiation, execution or performance of this Agreement (including any claim or cause of action based upon, arising out of or related to any representation or warranty made in or in connection with this Agreement) shall be governed by and construed in accordance with the Laws of the State of New York, without giving effect to any choice or conflict of law provision or rule (whether of the State of New York or any other jurisdiction) that would cause the application of the Laws of any jurisdiction other than the State of York.

Counterparts. This Agreement may be executed in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Counterparts may be delivered via facsimile, electronic mail or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

Titles and Subtitles. The titles and subtitles used in this Agreement are used for convenience only and are not to be considered in construing or interpreting this Agreement.

Notices. All notices and other communications given or made pursuant to this Agreement shall be in writing and shall be deemed effectively given upon the earlier of actual receipt, or (a) personal delivery to the party to be notified, (b) when sent, if sent by electronic mail during normal

business hours of the recipient, and if not sent during normal business hours, then on the recipient's next Business Day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) Business Day after deposit with a nationally recognized overnight courier, freight prepaid, specifying next Business Day delivery, with written verification of receipt. All communications shall be sent to the respective parties at their address as set forth on the signature page, or to such e-mail address or address as subsequently modified by written notice given in accordance with this Section 3.6.

Waiver. Waiver by the Company or the Purchaser of a breach hereunder by the Purchaser or the Company, respectively, shall not be construed as a waiver of any subsequent breach of the same or any other provision. No delay or omission by a party in exercising or availing itself of any right, power or privilege hereunder shall preclude the later exercise of any such right, power or privilege by such party. No waiver shall be effective unless made in writing with specific reference to the relevant provision(s) of this Agreement and signed by a duly authorized representative of the party granting the waiver. All remedies, either under this Agreement or by law or otherwise afforded to any party, shall be cumulative and not alternative.

Amendments. Any term of this Agreement may be amended or terminated only with the written consent of the Company and the Purchaser.

Severability. The invalidity or unenforceability of any provision hereof shall in no way affect the validity or enforceability of any other provision.

Entire Agreement. This Agreement and the Purchase Agreement constitute the full and entire understanding and agreement between the parties with respect to the subject matter hereof and thereof, and any other written or oral agreement relating to the subject matter hereof or thereof existing among the parties are expressly canceled.

Specific Enforcement. The parties hereto agree that irreparable damage would occur in the event that any of the provisions of this Agreement were not performed in accordance with their specific intent or were otherwise breached. It is accordingly agreed that the parties shall be entitled to an injunction or injunctions to prevent or cure breaches of the provisions of this Agreement and to enforce specifically the terms and provisions hereof, in addition to any other remedy to which they may be entitled by law or equity.

Exclusive Jurisdiction; Venue. Each of the parties hereto irrevocably agrees that any legal action or proceeding with respect to this Agreement and the rights and obligations arising hereunder, or for recognition and enforcement of any judgment in respect of this Agreement and the rights and obligations arising hereunder brought by another party hereto or its successors or assigns, shall be brought and determined exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan and agrees that it will not bring any action relating to this Agreement or any of the transactions contemplated by this Agreement in any court other than the aforesaid courts. Each of the parties hereto hereby irrevocably waives, and agrees not to assert as a defense, counterclaim or otherwise, in any action or proceeding with respect to this Agreement, (a) any claim that it is not personally subject to the jurisdiction of the above named courts for any reason other than the failure to serve in accordance

with this Section 4.12, (b) any claim that it or its property is exempt or immune from the jurisdiction of any such court or from any legal process commenced in such courts (whether through service of notice, attachment prior to judgment, attachment in aid of execution of judgment, execution of judgment or otherwise) and (c) to the fullest extent permitted by the applicable Law, any claim that (i) the suit, action or proceeding in such court is brought in an inconvenient forum, (ii) the venue of such suit, action or proceeding is improper or (iii) this Agreement, or the subject matter hereof, may not be enforced in or by such courts. Each of the parties hereto agrees that service of process upon such party in any such action or proceeding shall be effective if such process is given as a notice in accordance with Section 4.6.

Waiver of Jury Trial. EACH OF THE PARTIES TO THIS AGREEMENT HEREBY IRREVOCABLY WAIVES TO THE EXTENT PERMITTED BY APPLICABLE LAW ANY AND ALL RIGHT TO A TRIAL BY JURY IN ANY DIRECT OR INDIRECT ACTION, PROCEEDING OR COUNTERCLAIM ARISING OUT OF OR RELATING TO THIS AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY. EACH PARTY (A) CERTIFIES THAT NO REPRESENTATIVE, AGENT OR ATTORNEY OF ANY OTHER PARTY HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PARTY WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE THE FOREGOING WAIVER, (B) MAKES THIS WAIVER VOLUNTARILY, AND (C) ACKNOWLEDGES THAT EACH PARTY HAS BEEN INDUCED TO ENTER INTO THIS AGREEMENT BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS CONTAINED IN THIS SECTION 4.13.

Independent Nature of Holders' Obligations and Rights. The obligations of each Holder hereunder are several and not joint with the obligations of any other Holder hereunder, and no Holder shall be responsible in any way for the performance of the obligations of any other Holder hereunder. Nothing contained herein or in any other agreement or document delivered at any closing, and no action taken by any Holder pursuant hereto or thereto, shall be deemed to constitute the Holders as a partnership, an association, a joint venture or any other kind of group or entity, or create a presumption that the Holders are in any way acting in concert or as a group or entity with respect to such obligations or the transactions contemplated by this Agreement or any other matters, and the Company acknowledges that the Holders are not acting in concert or as a group, and the Company shall not assert any such claim, with respect to such obligations or transactions. Each Holder shall be entitled to protect and enforce its rights, including the rights arising out of this Agreement, and it shall not be necessary for any other Holder to be joined as an additional party in any proceeding for such purpose. The use of a single agreement with respect to the obligations of the Company contained herein was solely in the control of the Company, not the action or decision of any Holder, and was done solely for the convenience of the Company and not because it was required or requested to do so by any Holder. It is expressly understood and agreed that each provision contained in this Agreement is between the Company and a Holder, solely, and not between the Company and the Holders collectively and not between and among Holders.

[Signature pages follow]

IN WITNESS WHEREOF, each of the undersigned has duly executed this Agreement as of the date first above written.

Company: ARROWHEAD PHARMACEUTICALS, INC.

By: _____
Name:
Title:

Purchaser: SAREPTA THERAPEUTICS INVESTMENTS, INC.

By: _____
Name:
Title:

Exhibit B

Form of Pre-Funded Warrant

Form of Pre-Funded Warrant

THE SECURITIES REPRESENTED HEREBY AND THE SECURITIES ISSUABLE UPON EXERCISE OF THESE SECURITIES HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933. NO TRANSFER OF THE SECURITIES REPRESENTED HEREBY OR THE SECURITIES ISSUABLE UPON EXERCISE OF THESE SECURITIES MAY BE EFFECTED WITHOUT AN EFFECTIVE REGISTRATION STATEMENT RELATED THERETO OR AN OPINION OF COUNSEL IN A FORM SATISFACTORY TO THE COMPANY THAT SUCH REGISTRATION IS NOT REQUIRED UNDER THE SECURITIES ACT OF 1933.

PRE-FUNDED COMMON STOCK PURCHASE WARRANT

ARROWHEAD PHARMACEUTICALS, INC.

Warrant Shares: [●] Issue Date: [●]

THIS PRE-FUNDED COMMON STOCK PURCHASE WARRANT (the "Warrant") certifies that, for value received, Sarepta Therapeutics, Inc., a Delaware corporation, or its assigns (the "Holder") is entitled, upon the terms and subject to the limitations on exercise and the conditions hereinafter set forth, at any time on or after the date hereof (the "Initial Exercise Date"), to subscribe for and purchase from Arrowhead Pharmaceuticals, Inc., a Delaware corporation (the "Company"), up to [●] shares (as subject to adjustment hereunder, the "Warrant Shares") of Common Stock. The purchase price of one share of Common Stock under this Warrant shall be equal to the Exercise Price, as defined in Section 3(b).

Section 1. Definitions. For purposes of this Warrant, the following terms shall have the following meanings:

a) "Affiliate" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

b) "Business Day" means any day except any Saturday, any Sunday, any day which is a federal legal holiday in the United States or any day on which banking institutions in Pasadena, California or Cambridge, Massachusetts are authorized or required by law or other governmental action to close.

c) "Commission" means the United States Securities and Exchange Commission.

d) "Common Stock Equivalents" means any securities of the Company or the Subsidiaries which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, right, option, warrant or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

e) "Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

f) "Person" means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

g) "Securities Act" means the Securities Act of 1933, as amended.

h) "Stock Purchase Agreement" means that certain Stock Purchase Agreement dated as of [●].

i) "Trading Day" means a day on which the principal Trading Market is open for trading.

j) "Trading Market" means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market or the New York Stock Exchange (or any successors to any of the foregoing).

k) "Transfer Agent" means Computershare Trust Company, and any successor transfer agent of the Company.

Section 2. Issuance of Securities; Registration of Warrants. The Warrant, as initially issued by the Company, is offered and sold pursuant to the Stock Purchase Agreement. Accordingly, the Warrant and the Warrant Shares are "restricted securities" under Rule 144 promulgated under the Securities Act. The Company shall register ownership of this Warrant, upon records to be maintained by the Company for that purpose (the "Warrant Register"), in the name of the record Holder (which shall include the initial Holder or, as the case may be, any assignee to which this Warrant is permissibly assigned hereunder) from time to time. The Company may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary.

Section 3. Exercise.

a) Exercise of Warrant. Exercise of the purchase rights represented by this Warrant may be made, in whole or in part, at any time or times on or after the Initial Exercise Date by delivery to the Company of a duly executed PDF copy submitted by e-mail (or e-mail attachment) of the Notice of Exercise in the form annexed hereto, and delivered in accordance with the notice requirements set forth in Section 6(g) (the "Notice of Exercise"). Notwithstanding the foregoing, with respect to any Notice of Exercise delivered on or prior to the Initial Exercise Date, the Company agrees to deliver the Warrant Shares subject to such Notice(s) of Exercise by 5:30 p.m. (New York time) on the Initial Exercise Date. Within the earlier of (i) one (1) Trading Day and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined in Section 3(d)(i) herein) following the date of exercise as aforesaid, the Holder shall deliver the aggregate Exercise Price (as defined below) for the Warrant Shares specified in the applicable Notice of Exercise by wire transfer or cashier's check drawn on a United States bank unless the

cashless exercise procedure specified in Section 3(c) below is applicable and specified in the applicable Notice of Exercise. No ink-original Notice of Exercise shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Exercise be required. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company until the Holder has purchased all of the Warrant Shares available hereunder and the Warrant has been exercised in full, in which case, the Holder shall surrender this Warrant to the Company for cancellation within five (5) Trading Days of the date on which the final Notice of Exercise is delivered to the Company. Partial exercises of this Warrant resulting in purchases of a portion of the total number of Warrant Shares available hereunder shall have the effect of lowering the outstanding number of Warrant Shares purchasable hereunder in an amount equal to the applicable number of Warrant Shares purchased. The Holder and the Company shall maintain records showing the number of Warrant Shares purchased and the date of such purchases. The Company shall deliver any objection to any Notice of Exercise within one (1) Trading Day of receipt of such notice. **The Holder and any assignee, by acceptance of this Warrant, acknowledge and agree that, by reason of the provisions of this paragraph, following the purchase of a portion of the Warrant Shares hereunder, the number of Warrant Shares available for purchase hereunder at any given time may be less than the amount stated on the face hereof.**

b) Exercise Price. The aggregate exercise price of this Warrant, except for a nominal exercise price of $0.001 per Warrant Share, was pre-funded to the Company on or prior to the Initial Exercise Date and, consequently, no additional consideration (other than the nominal exercise price of $0.001 per Warrant Share) shall be required to be paid by the Holder to any Person to effect any exercise of this Warrant. The Holder shall not be entitled to the return or refund of all, or any portion, of such pre-paid aggregate exercise price under any circumstance or for any reason whatsoever. The remaining unpaid exercise price per share of Common Stock under this Warrant shall be $0.001, subject to adjustment hereunder (the "Exercise Price").

c) Cashless Exercise. This Warrant may also be exercised, in whole or in part, at such time by means of a "cashless exercise" in which the Holder shall be entitled to receive a number of Warrant Shares equal to the quotient obtained by dividing [(A-B) (X)] by (A), where:

(A) = as applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise if such Notice of Exercise is (1) both executed and delivered pursuant to Section 3(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 3(a) hereof on a Trading Day prior to the opening of "regular trading hours" (as defined in Rule 600(b)(88) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) at the option of the Holder as indicated on the Notice of Exercise, either (y) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise or (z) the Bid Price of the Common Stock on the principal Trading Market as reported by Bloomberg L.P. as of the time of the Holder's execution of the applicable Notice of Exercise if such Notice of Exercise is executed during "regular trading hours" on a Trading Day and is delivered within two (2) hours thereafter (including until two (2) hours after the close of "regular

trading hours" on a Trading Day) pursuant to Section 3(a) hereof or (iii) the VWAP on the date of the applicable Notice of Exercise if the date of such Notice of Exercise is a Trading Day and such Notice of Exercise is both executed and delivered pursuant to Section 3(a) hereof after the close of "regular trading hours" on such Trading Day;

(B) = the Exercise Price of this Warrant, as adjusted hereunder; and

(X) = the number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

If Warrant Shares are issued in such a cashless exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the Warrant Shares shall take on the characteristics of the Warrants being exercised, and for purposes of Rule 144, the holding period of the Warrant Shares being issued may be tacked on to the holding period of this Warrant. The Company agrees not to take any position contrary to this Section 3(c), except to the extent required by change in applicable law, rule or regulation after the date hereof.

"Bid Price" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the bid price of the Common Stock for the time in question (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on The Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined in good faith by the Board of Directors of the Company.

"VWAP" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported on The Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by the Board of Directors of the Company and reasonably

agreed to by the Holders of a majority in interest of the Warrants then outstanding.

d) Mechanics of Exercise.

i. Delivery of Warrant Shares Upon Exercise. The Company shall cause the Warrant Shares purchased hereunder to be transmitted to the Holder by crediting the account of the Holder's or its designee's balance account with The Depository Trust Company through its Deposit or Withdrawal at Custodian system ("DWAC") if the Company is then a participant in such system, or, at the request of the Holder, in electronic book entry form to the account of the Holder registered in the Company's share register in the name of the Holder or its designee, for the number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the address specified by the Holder in the Notice of Exercise by the date that is the later of one (1) Trading Day after delivery of the aggregate Exercise Price to the Company and (ii) the number of Trading Days comprising the Standard Settlement Period subject to the delivery to the Company of the Notice of Exercise (such date, the "Warrant Share Delivery Date"). Upon delivery of the Notice of Exercise, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date of delivery of the Warrant Shares, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received by the Warrant Share Delivery Date. The Company agrees to maintain a transfer agent that is a participant in the FAST program so long as this Warrant remains outstanding and exercisable. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Company's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Exercise.

ii. Delivery of New Warrants Upon Exercise. If this Warrant has been exercised in part, the Company shall, at the request of a Holder and upon surrender of this Warrant, as soon as practicable following the time of delivery of the Warrant Shares, deliver to the Holder a new Warrant evidencing the rights of the Holder to purchase the unpurchased Warrant Shares called for by this Warrant, which new Warrant shall in all other respects be identical with this Warrant.

iii. Compensation for Buy-In on Failure to Timely Deliver Warrant Shares Upon Exercise. In addition to any other rights available to the Holder, if the Company fails to transmit to the Holder the Warrant Shares in accordance with the provisions of Section 3(d)(i) above pursuant to an exercise on or before the Warrant Share Delivery Date (other than a failure caused by incorrect or incomplete information provided by the Holder to the Company), and if after such date the Holder purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by the Holder of the Warrant Shares which the Holder anticipated receiving upon such exercise (a "Buy-In"), then the Company shall, within two (2) Trading Days after the Holder's request, (A) pay in cash to the Holder the amount, if any, by which (x) the Holder's total purchase price (including commercially reasonable brokerage commissions, if any) for the shares of Common Stock so purchased exceeds (y) the amount obtained by multiplying (1) the number

of Warrant Shares that the Company was required to deliver to the Holder in connection with the exercise at issue times (2) the price at which the sell order giving rise to such purchase obligation was executed (assuming such sale was executed on commercially reasonable terms at prevailing market prices and, if the sale was executed in multiple transactions, the volume weighted average price), and (B) at the option of the Holder, either reinstate the portion of the Warrant and equivalent number of Warrant Shares for which such exercise was not honored (in which case such exercise shall be deemed rescinded) or deliver to the Holder the number of shares of Common Stock that would have been issued had the Company timely complied with its exercise and delivery obligations hereunder. For example, if the Holder purchases Common Stock having a total purchase price of $11,000 to cover a Buy-In with respect to an attempted exercise of shares of Common Stock with an aggregate sale price giving rise to such purchase obligation of $10,000, under clause (A) of the immediately preceding sentence the Company shall be required to pay the Holder $1,000. The Holder shall provide the Company written notice within two (2) Trading Days after the occurrence of a Buy-In indicating the amounts payable to the Holder in respect of the Buy-In and, upon request of the Company, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver shares of Common Stock upon exercise of the Warrant as required pursuant to the terms hereof.

iv. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such exercise, the Company shall, at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Exercise Price or round up to the next whole share.

v. Charges, Taxes and Expenses. Issuance of Warrant Shares shall be made without charge to the Holder for any issue or transfer tax or other incidental expense in respect of the issuance of such Warrant Shares, all of which taxes and expenses shall be paid by the Company, and such Warrant Shares shall be issued in the name of the Holder or in such name or names as may be directed by the Holder; provided, however, that, in the event that Warrant Shares are to be issued in a name other than the name of the Holder, this Warrant when surrendered for exercise shall be accompanied by the Assignment Form attached hereto duly executed by the Holder and the Company may require, as a condition thereto, the payment of a sum sufficient to reimburse it for any transfer tax incidental thereto. The Company shall, to the extent applicable, pay all Transfer Agent fees required for processing of any Notice of Exercise and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for electronic delivery of the Warrant Shares.

vi. Closing of Books. The Company will not close its stockholder books or records in

any manner which prevents the timely exercise of this Warrant, pursuant to the terms hereof.

e) Holder's Exercise Limitations. The Company shall not effect any exercise of this Warrant, and a Holder shall not have the right to exercise any portion of this Warrant, pursuant to Section 3 or otherwise, to the extent that after giving effect to such issuance after exercise as set forth on the applicable Notice of Exercise, the Holder (together with (i) the Holder's Affiliates, (ii) any other Persons acting as a group together with the Holder or any of the Holder's Affiliates, and (iii) any other Persons whose beneficial ownership of the Common Stock would or could be aggregated with the Holder's for purposes of Section 13(d) of the Exchange Act (such Persons set forth in clause (i) through (iii) above, "Attribution Parties")), would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by the Holder and its Attribution Parties shall include the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (i) exercise of the remaining, nonexercised portion of this Warrant beneficially owned by the Holder or any of its Attribution Parties and (ii) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Company (including, without limitation, any other Common Stock Equivalents) subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 3(e), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. The determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Attribution Parties) and of which portion of this Warrant is exercisable shall be in the sole discretion of the Holder, and the submission of a Notice of Exercise shall be deemed to be the Holder's determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Attribution Parties) and of which portion of this Warrant is exercisable, in each case subject to the Beneficial Ownership Limitation, and the Company shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 3(e), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as reflected in (A) the Company's most recent periodic or annual report filed with the Commission, as the case may be, (B) a more recent public announcement by the Company or (C) a more recent written notice from the Company or the Transfer Agent to the Holder setting forth the number of shares of Common Stock outstanding. Upon the written or oral request of a Holder, the Company shall within one (1) Trading Day confirm in writing to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder or its Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 4.99% of the number of shares

of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon exercise of this Warrant. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Company. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 3(e) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation herein contained or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of this Warrant.

At least ten (10) business days prior to the record date established for stockholders of the Company to vote on any matter related to (i) a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off, merger or scheme of arrangement) or asset purchase agreement to which the Company is a party, (ii) a dissolution, liquidation or winding up of the Company, or (ii) any matter governed by Rule 5635(a), Rule 5635(b) or Rule 5635(d) of The Nasdaq Stock Market, that requires that a preliminary proxy be filed with the SEC, but no more than twenty (20) business days prior to the establishment of such record date, the Company shall provide Holder with written notice of the establishment of such record date, along with a reasonably detailed description of the proposal(s) to be included in the preliminary proxy statement to be filed in connection with such matter (the "**Record Date Notice**" and the date the Record Date Notice was provided, the "**Record Date Notice Date**"). If the Holder provides the Company with a written election referencing this provision prior to the date that is five (5) business days after the Record Date Notice Date, notwithstanding the Beneficial Ownership Limitation set forth in this Section 3(e), this Warrant will be immediately and automatically exercised on a cashless basis.

f) No Set-off. To the extent permitted by law and subject to Section 3(d)(iii), the Company's obligations to issue and deliver Warrant Shares in accordance with and subject to the terms hereof (including the limitations set forth in 3(e)) are absolute and unconditional, irrespective of any action or inaction by the Holder to enforce the same, any waiver or consent with respect to any provision hereof, the recovery of any judgment against any Person or any action to enforce the same, or any setoff, counterclaim, recoupment, limitation or termination, or any breach or alleged breach by the Holder or any other Person of any obligation to the Company or any violation or alleged violation of law by the Holder or any other Person, and irrespective of any other circumstance that might otherwise limit such obligation of the Company to the Holder in connection with the issuance of Warrant Shares. Subject to Section 3(d)(iii), nothing herein shall limit the Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver shares of Common Stock upon exercise of the Warrant as required pursuant to the terms hereof.

Section 4. Certain Adjustments.

a) Stock Dividends and Splits. If the Company, at any time while this Warrant is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions on shares of its

Common Stock or any other equity or equity equivalent securities payable in shares of Common Stock (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Company upon exercise of this Warrant), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of reverse stock split) outstanding shares of Common Stock into a smaller number of shares of Common Stock, or (iv) issues by reclassification of shares of the Common Stock any shares of capital stock of the Company, then in each case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding treasury shares, if any) outstanding immediately before such event and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event, and the number of shares issuable upon exercise of this Warrant shall be proportionately adjusted such that the aggregate Exercise Price of this Warrant shall remain unchanged. Any adjustment made pursuant to this Section 4(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Subsequent Rights Offerings. In addition to (but without duplication of) any adjustments pursuant to Section 4(a) above, if at any time the Company grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then, in each such case, upon any exercise of this Warrant that occurs after the record date fixed for determination of stockholders entitled to receive such distribution, the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights; provided, however, that, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (and shall not be entitled to beneficial ownership of such Common Stock as a result of such Purchase Right (and beneficial ownership) to such extent) and such Purchase Right to such extent shall be held in abeyance for the benefit of the Holder until such time or times as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation, at which time or times the Holder shall be granted such right (and any Purchase Right granted, issued or sold on such initial Purchase Right or on any subsequent Purchase Right to be held similarly in abeyance) to the same extent as if there had been no such limitation) , provided, further, that such Purchase Rights need not be held in abeyance for the benefit of the Holder if the Holder was separately offered substantially equivalent Purchase Rights outside of the Warrant.

c) Pro Rata Distributions. During such time as this Warrant is outstanding, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire

its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution; provided, however, that, to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until the earlier of (i) such time, if ever, as the delivery to such Holder of such portion would not result in the Holder exceeding the Beneficial Ownership Limitation and (ii) such time as the Holder has exercised this Warrant.

d) Fundamental Transaction. If, at any time while this Warrant is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another Person, in which the Company is not the surviving entity or the stockholders of the Company immediately prior to such merger or consolidation do not own, directly or indirectly, at least 50% of the voting power of the surviving entity immediately after such merger or consolidation, (ii) the Company, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Company or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of more than 50% of the voting power of the capital stock of the Company, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off, merger or scheme of arrangement) with another Person or group of Persons whereby such other Person or group acquires more than 50% of the voting power of the capital stock of the Company (not including any shares of capital stock of the Company held by the other Person or other Persons making or party to, or associated or affiliated with the other Persons making or party to, such stock or share purchase agreement or other business combination) and in connection with such transaction the Common Stock is converted into or exchanged for other securities, cash or property (each a "Fundamental Transaction"), then, upon the consummation of such Fundamental

Transaction, this Warrant shall automatically be converted into the right of the Holder to receive, for each Warrant Share that would have been issuable upon such exercise immediately prior to the occurrence of such Fundamental Transaction (without regard to any limitation in Section 3(e) on the exercise of this Warrant) the securities, cash and other property of the successor or acquiring corporation (or ultimate parent thereof) or of the Company, if it is the surviving corporation, as applicable, (the "Alternate Consideration") receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Warrant is exercisable immediately prior to such Fundamental Transaction (without regard to any limitation in Section 3(e) on the exercise of this Warrant). For purposes of this Section 4(d), the determination of the Exercise Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Company shall apportion the Exercise Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of capital stock of the Company are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon the consummation of any such Fundamental Transaction. The Company shall not effect a Fundamental Transaction in which the Company is not the surviving corporation or the Alternate Consideration includes securities of another Person unless (i) the Alternate Consideration is solely cash and the definitive agreement in respect thereof provides for the simultaneous "cashless exercise" of this Warrant pursuant to Section 3(c), or (ii) prior to or simultaneously with the consummation thereof, any successor to the Company or surviving entity (the "Successor Entity") shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Warrant referring to the "Company" shall refer instead to the Successor Entity) and shall assume all of the obligations of the Company under this Warrant with the same effect as if such Successor Entity had been named as the Company herein.

e) Calculations. All calculations under this Section 4 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 4, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding treasury shares, if any) issued and outstanding.

f) Notice to Holder.

   i. Adjustment to Exercise Price. Whenever the Exercise Price is adjusted pursuant to any provision of this Section 4, the Company shall promptly deliver to the Holder by email a notice setting forth the Exercise Price after such adjustment and any resulting adjustment to the number of Warrant Shares and setting forth a brief statement of the facts requiring such adjustment.

   ii. Notice to Allow Exercise by Holder. If (A) the Company shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Company shall declare a special nonrecurring cash dividend on or a redemption of

the Common Stock, (C) the Company shall authorize the granting to all holders of the Common Stock rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Company shall be required in connection with any reclassification of the Common Stock, any consolidation or merger to which the Company (and all of its Subsidiaries, taken as a whole) is a party, any sale or transfer of all or substantially all of the assets of the Company, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property, or (E) the Company shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Company, then, in each case, the Company shall cause to be delivered by email to the Holder at its last email address as it shall appear upon the Warrant Register (as defined below), at least 10 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange; provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. Holder agrees to maintain any information disclosed pursuant to this Section 4(f) in confidence until such information is publicly available, and shall comply with applicable law with respect to trading in the Company's securities following receipt any such information. The Holder shall remain entitled to exercise this Warrant during the period commencing on the date of such notice to the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

Section 5. Transfer of Warrant.

a) Transferability. Subject to compliance with any applicable securities laws, this Warrant and all rights hereunder (including, without limitation, any registration rights) are transferable, in whole or in part, upon surrender of this Warrant at the principal office of the Company or its designated agent, together with a written assignment of this Warrant substantially in the form attached hereto duly executed by the Holder or its agent or attorney and funds sufficient to pay any transfer taxes payable upon the making of such transfer. Upon such surrender and, if required, such payment, the Company shall execute and deliver a new Warrant or Warrants in the name of the assignee or assignees, as applicable, and in the denomination or denominations specified in such instrument of assignment, and shall issue to the assignor a new Warrant evidencing the portion of this Warrant not so assigned, and this Warrant shall promptly be cancelled. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company unless the Holder has assigned this Warrant in full, in which

case, the Holder shall surrender this Warrant to the Company within five (5) Trading Days of the date on which the Holder delivers an assignment form to the Company assigning this Warrant in full. The Warrant, if properly assigned in accordance herewith, may be exercised by a new holder for the purchase of Warrant Shares without having a new Warrant issued.

b) New Warrants. This Warrant may be divided or combined with other Warrants upon presentation hereof at the aforesaid office of the Company, together with a written notice specifying the names and denominations in which new Warrants are to be issued, signed by the Holder or its agent or attorney. Subject to compliance with Section 5(a), as to any transfer which may be involved in such division or combination, the Company shall execute and deliver a new Warrant or Warrants in exchange for the Warrant or Warrants to be divided or combined in accordance with such notice. All Warrants issued on transfers or exchanges shall be dated the initial issuance date of this Warrant and shall be identical with this Warrant except as to the number of Warrant Shares issuable pursuant thereto.

c) Warrant Register. The Company shall register this Warrant in the Warrant Register in the name of the record Holder hereof from time to time. The Company may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary.

Section 6. Miscellaneous.

a) No Rights as Stockholder Until Exercise; No Settlement in Cash. This Warrant does not entitle the Holder to any voting rights, dividends or other rights as a stockholder of the Company prior to the exercise hereof as set forth in Section 3(d)(i), except as expressly set forth in Section 4.

b) Loss, Theft, Destruction or Mutilation of Warrant. The Company covenants that upon receipt by the Company of evidence reasonably satisfactory to it of the loss, theft, destruction or mutilation of this Warrant or any stock certificate relating to the Warrant Shares, and in case of loss, theft or destruction, of indemnity or security reasonably satisfactory to it (which, in the case of the Warrant, shall not include the posting of any bond), and upon surrender and cancellation of such Warrant or stock certificate, if mutilated, the Company will make and deliver a new Warrant or stock certificate of like tenor and dated as of such cancellation, in lieu of such Warrant or stock certificate.

c) Saturdays, Sundays, Holidays, etc. If the last or appointed day for the taking of any action or the expiration of any right required or granted herein shall not be a Business Day, then, such action may be taken or such right may be exercised on the next succeeding Business Day.

d) Authorized Shares. The Company covenants that, during the period the Warrant is outstanding, it will reserve from its authorized and unissued Common Stock a sufficient number of shares to provide for the issuance of the Warrant Shares upon the exercise of any purchase rights under this Warrant. The Company further covenants that its issuance

of this Warrant shall constitute full authority to its officers who are charged with the duty of issuing the necessary Warrant Shares upon the exercise of the purchase rights under this Warrant. The Company will take all such reasonable action as may be necessary to assure that such Warrant Shares may be issued as provided herein without violation of any applicable law or regulation, or of any requirements of the Trading Market upon which the Common Stock may be listed. The Company covenants that all Warrant Shares which may be issued upon the exercise of the purchase rights represented by this Warrant will, upon exercise of the purchase rights represented by this Warrant and payment for such Warrant Shares in accordance herewith, be duly authorized, validly issued, fully paid and nonassessable and free from all taxes, liens and charges created by the Company in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously with such issue).

Except and to the extent as waived or consented to by the Holder, the Company shall not by any action, including, without limitation, amending its certificate of incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such actions as may be necessary or appropriate to protect the rights of Holder as set forth in this Warrant against impairment. Without limiting the generality of the foregoing, the Company will (i) not increase the par value of any Warrant Shares above the amount payable therefor upon such exercise immediately prior to such increase in par value, (ii) take all such action as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable Warrant Shares upon the exercise of this Warrant and (iii) use commercially reasonable efforts to obtain all such authorizations, exemptions or consents from any public regulatory body having jurisdiction thereof, as may be, necessary to enable the Company to perform its obligations under this Warrant.

Before taking any action which would result in an adjustment in the number of Warrant Shares for which this Warrant is exercisable or in the Exercise Price, the Company shall obtain all such authorizations or exemptions thereof, or consents thereto, as may be necessary from any public regulatory body or bodies having jurisdiction thereof.

e) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Warrant shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. Each party agrees that all legal proceedings concerning the interpretations, enforcement and defense of the transactions contemplated by this Warrant shall be commenced exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is improper or is an inconvenient venue for such proceeding. Each party hereby irrevocably waives personal service of process and

consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Warrant and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law. If either party shall commence an action, suit or proceeding to enforce any provisions of this Warrant, the prevailing party in such action, suit or proceeding shall be reimbursed by the other party for their reasonable attorneys' fees and other costs and expenses incurred with the investigation, preparation and prosecution of such action or proceeding.

f) Nonwaiver and Expenses. No course of dealing or any delay or failure to exercise any right hereunder on the part of Holder shall operate as a waiver of such right or otherwise prejudice the Holder's rights, powers or remedies. Without limiting any other provision of this Warrant, if the Company willfully and knowingly fails to comply with any provision of this Warrant, which results in any material damages to the Holder, the Company shall pay to the Holder such amounts as shall be sufficient to cover any costs and expenses including, but not limited to, reasonable attorneys' fees, including those of appellate proceedings, incurred by the Holder in collecting any amounts due pursuant hereto or in otherwise enforcing any of its rights, powers or remedies hereunder.

g) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Exercise, shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service, addressed to the Company, at Arrowhead Pharmaceuticals, Inc., 117 E. Colorado Blvd., Suite 700, Pasadena, CA 91105, Attention: General Counsel, e-mail: General.Counsel@arrowheadpharma.com, or such other email address or address as the Company may specify for such purposes by notice to the Holders. Any and all notices or other communications or deliveries to be provided by the Company hereunder shall be in writing and delivered personally, by e-mail, or sent by a nationally recognized overnight courier service addressed to each Holder at the e-mail address or address of such Holder appearing on the books of the Company. Any notice or other communication or deliveries hereunder shall be deemed effectively given upon the earlier of actual receipt, or (a) personal delivery to the party to be notified, (b) when sent, if sent by electronic mail during normal business hours of the recipient, and if not sent during normal business hours, then on the recipient's next Business Day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) Business Day after deposit with a nationally recognized overnight courier, freight prepaid, specifying next Business Day delivery, with written verification of receipt.

h) Limitation of Liability. No provision hereof, in the absence of any affirmative action by the Holder to exercise this Warrant to purchase Warrant Shares, and no enumeration herein of the rights or privileges of the Holder, shall give rise to any liability of the Holder for the purchase price of any Common Stock or as a stockholder of the Company, whether such liability is asserted by the Company or by creditors of the Company.

i) Remedies. The Holder, in addition to being entitled to exercise all rights granted by law,

including recovery of damages, will be entitled to specific performance of its rights under this Warrant without the need to post a bond or make any undertaking. The Company agrees that monetary damages would not be adequate compensation for any loss incurred by reason of a breach by it of the provisions of this Warrant and hereby agrees to waive and not to assert the defense in any action for specific performance that a remedy at law would be adequate.

j) Successors and Assigns. Subject to applicable securities laws, this Warrant and the rights and obligations evidenced hereby shall inure to the benefit of and be binding upon the successors and permitted assigns of the Company and the successors and permitted assigns of Holder. The provisions of this Warrant are intended to be for the benefit of any Holder from time to time of this Warrant and shall be enforceable by the Holder or holder of Warrant Shares.

k) Amendment. This Warrant may be modified or amended or the provisions hereof waived with the written consent of the Company, on the one hand, and the Holder, on the other hand.

l) Severability. Wherever possible, each provision of this Warrant shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Warrant shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provisions or the remaining provisions of this Warrant.

m) Headings. The headings used in this Warrant are for the convenience of reference only and shall not, for any purpose, be deemed a part of this Warrant.

****

(Signature Page Follows)

IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its officer thereunto duly authorized as of the date first above indicated.

ARROWHEAD PHARMACEUTICALS, INC.

By: _____

Name:

Title:

NOTICE OF EXERCISE

TO: **ARROWHEAD PHARMACEUTICALS, INC.**

(1) The undersigned hereby elects to purchase _____ Warrant Shares of the Company pursuant to the terms of the attached Warrant (only if exercised in full), and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.

(2) Payment shall take the form of (check applicable box):

☐ in lawful money of the United States; or

☐ if permitted the cancellation of such number of Warrant Shares as is necessary, in accordance with the formula set forth in subsection 3(c), to exercise this Warrant with respect to the maximum number of Warrant Shares purchasable pursuant to the cashless exercise procedure set forth in subsection 3(c).

(3) Please issue said Warrant Shares in the name of the undersigned or in such other name as is specified below:

The Warrant Shares shall be delivered to the following DWAC Account Number:

[SIGNATURE OF HOLDER]

Name of Investing Entity:

_____

Signature of Authorized Signatory of Investing Entity:

_____

Name of Authorized Signatory:

_____

Title of Authorized Signatory:

_____

Date:

_____

_____

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name:

_____

(Please Print)

Address: _____

Phone Number: (Please Print)

Email Address:

Dated: _____ __, _____ _____

Holder's Signature: _____

_____

Holder's Address:

_____

SECURITIES PURCHASE AGREEMENT

THIS SECURITIES PURCHASE AGREEMENT (this "**Agreement**") is entered into as of November 25, 2024, by and among Arrowhead Pharmaceuticals, Inc., a Delaware corporation (the "**Company**"), and Avoro Life Sciences Fund LLC, a Delaware limited liability company ("**Purchaser**" and, together with the Company, the "**Parties**").

RECITALS

WHEREAS, the Company desires to issue and sell to Purchaser common stock, par value $0.0001 per share, of the Company (the "**Common Stock**"), or, in lieu thereof, a pre-funded warrant to purchase shares of Common Stock, in the form attached hereto as Exhibit A (the "**Pre-Funded Warrant**"), for an aggregate purchase price, including the exercise price of the Pre-Funded Warrant, of $25,000,909.46;

WHEREAS, the Company and Purchaser are executing and delivering this Agreement in reliance upon the exemption from securities registration afforded by Section 4(a)(2) of the Securities Act; and

WHEREAS, subject to the terms and conditions set forth in this Agreement, Purchaser desires to purchase from the Company the Shares (as defined below) and the Pre-Funded Warrant (together, the "**Securities**").

NOW, THEREFORE, in consideration of the mutual agreements, representations, warranties, covenants and conditions set forth in this Agreement, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto hereby agree as follows:

1. PURCHASE AND SALE

1.1 Sale and Issuance of the Securities. In reliance upon the representations, warranties and covenants set forth herein, and subject to the terms and conditions set forth in this Agreement, the Company shall issue and sell to Purchaser, and Purchaser shall purchase from the Company, such number of shares of Common Stock (the "**Shares**") at a purchase price per share equal to $27.2507, or, in lieu thereof, the Pre-Funded Warrant entitling Purchaser to purchase shares of Common Stock, at a purchase price equal to $27.2497, as set forth on the Purchaser's signature page. The shares of Common Stock issuable upon exercise of the Pre-Funded Warrant shall be referred to in this Agreement as the "**Warrant Shares**". In the event of any stock dividend, stock split, combination of shares, recapitalization or other similar change in the capital structure of the Company after the date hereof and on or prior to the Closing that affects or relates to the Common Stock, the number of Shares to be issued to Purchaser pursuant to this Agreement and the number of Warrant Shares to be issued to Purchaser upon exercise of the Pre-Funded Warrant shall be adjusted proportionately.

1.2 Closing.

(a) The purchase and sale of the Securities shall take place remotely at 10:00 a.m. (Pacific Time) on the date that is two Business Days following the date of this

Agreement, or at such other time as the Company and Purchaser shall mutually agree (which time, date and place are referred to in this Agreement as the "**Closing**"). At the Closing, the Company shall instruct Computershare Trust Company (the "**Transfer Agent**") to register the issuance of the Shares (as defined below) via book entry, free and clear of all restrictive and other legends (except as expressly provided in Section 3.3(c)) and the Company shall deliver to Purchaser the Pre-Funded Warrant, registered in the name of Purchaser, against delivery to the Company by Purchaser at the Closing of $24,999,992.02, payable in immediately available funds by wire transfer to an account or accounts designated by the Company. "**Business Day**" means any day except Saturday, Sunday and any legal holiday or a day on which banking institutions in Pasadena, California generally are authorized or required by law or other governmental actions to close.

(b) At the Closing, the Company and Purchaser shall execute and deliver a registration rights agreement in the form attached as Exhibit B hereto (the "**Registration Rights Agreement**").

2. REPRESENTATIONS AND WARRANTIES OF THE COMPANY

As of the date hereof and as of the Closing, the Company represents and warrants to Purchaser that the statements contained in this Section 2 are true, complete and correct (except that those statements which address matters only as of a particular date are true, correct and complete as of such date).

2.1 Organization and Qualification. The Company and each subsidiary of the Company is a corporation duly organized, validly existing and in good standing under the laws of the State of Delaware and has the requisite corporate power and authority to own, lease and operate its properties and assets and to carry on its business as now conducted and as it is described in the SEC Filings (as defined below), and with respect to the Company, to enter into this Agreement and to consummate the transactions contemplated hereby. The Company and each subsidiary of the Company is duly qualified to transact business and is in good standing in each jurisdiction in which the failure to so qualify would or would be reasonably expected to have, individually or in the aggregate, a material adverse effect on (i) the business, properties, prospects, or financial condition of the Company or any of its subsidiaries, (ii) the ability of the Company to perform in a timely manner its obligations under this Agreement or to consummate the transactions contemplated hereby, or (iii) the enforceability of this Agreement (a "**Material Adverse Effect**"); provided that none of the following shall be taken into account in determining whether there is a Material Adverse Effect: (a) any change in the market price or trading volume of the Company's stock; (b) any change in the industries in which the Company or its subsidiaries operates generally or the United States economy or in other countries in which the Company conducts material operations, or in the financial markets or political conditions generally; (c) any change or effect arising from or relating to any change in legal requirements or generally accepted accounting principles ("**GAAP**") (or interpretations of any legal requirements or GAAP) unrelated to the transactions contemplated by this Agreement and of general applicability; or (d) any adverse change proximately caused by the public announcement of the execution of, this Agreement (provided any such public announcement is not in breach of this Agreement); provided, that such changes do not, individually or in the aggregate, have a

disproportionate adverse impact on the Company, taken as a whole, relative to any other "person" as such term is defined under Section 3(a)(9) of the Securities Exchange Act of 1934, as amended (the "**Exchange Act**") and as used in Sections 13(d)(3) and 14(d)(2) of the Exchange Act ("**Person**") in the industries or markets in which the Company operates.

2.2 Certificate of Incorporation and Bylaws. The certificate of incorporation, bylaws and documents of similar substance (the "**Governing Documents**") of the Company and its subsidiaries that are on file with the United States Securities and Exchange Commission (the "**SEC**") are current, complete and correct copies thereof as in effect on the date hereof. The Governing Documents of the Company and its subsidiaries are in full force and effect. The Company and each subsidiary of the Company are in compliance with the terms of their respective Governing Documents.

2.3 Capitalization.

(a) As of November 22, 2024, the authorized capital stock of the Company consists of 295,000,000 shares of capital stock, of which 290,000,000 are designated as Common Stock and 5,000,000 are designated as preferred stock, $0.001 par value per share ("**Preferred Stock**"). As of November 22, 2024, (i) 124,435,942 shares of Common Stock were issued and outstanding; (ii) 1,952,234 shares of Common Stock were issuable (and such number was reserved for issuance) upon exercise of options to purchase Common Stock (the "**Options**") outstanding as of such date; (iii) 4,858,693 shares of Common Stock were issuable (and such number was reserved for issuance) upon vesting of restricted stock units for the issuance of Common Stock (the "**RSUs**") outstanding as of such date; (iv) no shares of Common Stock were issuable (and such number was reserved for issuance) upon exercise of warrants to purchase Common Stock (the "**Warrants**") outstanding as of such date; and (v) no shares of Preferred Stock were issued and outstanding.

(b) As of November 22, 2024, except for (i) the Options, (ii) the RSUs, and (iii) the Warrants, there were no options, warrants or other rights to acquire capital stock or other equity interests from the Company, securities convertible into or exchangeable for such capital stock or other equity interests, stock appreciation rights, phantom stock, stock rights or other equity-based interests in respect of the Company. From November 22, 2024, 2024 to the date hereof, other than (A) shares of capital stock reserved for issuance as provided in this Section 2.3 and (B) options to purchase Common Stock or other equity awards issued in accordance with the Company's 2013 Incentive Plan and 2021 Incentive Plan and the Executive Incentive Plan, the Company has not issued any shares of its capital stock or other equity interests, or securities convertible into or exchangeable for such capital stock or other equity interests except as set forth in its filings under the Securities Act of 1933, as amended ("**Securities Act**"), and the Exchange Act. The Shares to be issued in connection with the Agreement, when issued as contemplated herein, will be duly authorized, validly issued, fully paid and nonassessable, will not be in violation of any preemptive rights and will be free and clear of all liens, charges, restrictions, claims, rights of first refusal and encumbrances except as set forth in this Agreement. The Warrant Shares have been reserved for issuance and, upon exercise of the Pre-Funded Warrant, in accordance with its terms, including the

payment of any exercise price therefor, will be validly issued, fully paid and nonassessable, will not be in violation of any preemptive rights and will be free and clear of all liens, charges, restrictions, claims, rights of first refusal and encumbrances except as set forth in this Agreement and the Company's Governing Documents. The issuance and sale of the Securities, and the issuance of the Warrant Shares upon exercise of the Pre-Funded Warrant, will not obligate the Company to issue shares of Common Stock or other securities to any Person (other than Purchaser) and will not result in a right of any holder of Company securities to adjust the exercise, conversion, exchange or reset price under any of such securities.

2.4 Authorization; Enforceability.

(a) The Company has all requisite corporate power and authority to execute, deliver and perform, as applicable, this Agreement and to issue and sell the Securities, and to issue the Warrant Shares upon exercise of the Pre-Funded Warrant, each in accordance with the terms hereof.

(b) All corporate action on the part of the Company and its officers and directors necessary for (i) the authorization, execution, delivery and performance of all obligations of the Company under this Agreement has been taken and (ii) the issuance and sale by the Company of the Securities hereunder has been taken. This Agreement constitutes a valid and legally binding obligation of the Company, enforceable in accordance with its terms, except (A) as limited by applicable bankruptcy, insolvency, reorganization, moratorium and other laws of general application affecting enforcement of creditors' rights generally or by equitable principles and (B) as limited by laws relating to the availability of specific performance, injunctive relief or other equitable remedies (the "**Equitable Exceptions**"). No action on the part of the Company's stockholders is necessary for the authorization, execution, delivery or performance of the Company's obligations hereunder.

2.5 SEC Filings; Financial Statements.

(a) The Company has timely filed with or furnished to the SEC all registration statements, prospectuses, forms, reports, definitive proxy statements, schedules and documents required to be filed by it under the Securities Act or the Exchange Act, as the case may be (collectively, the "**SEC Filings**"). Each SEC Filing, as amended or supplemented, if applicable, (i) as of its date, or, if amended, as of the date of the last such amendment, complied in all material respects with the applicable requirements of the Securities Act, the Exchange Act and the Sarbanes-Oxley Act of 2002, as amended (the "**Sarbanes-Oxley Act**"), as the case may be, and the rules and regulations of the SEC thereunder, applicable to such SEC Filing, and (ii) did not, at the time it was filed (or at the time it became effective in the case of registration statements), or, if amended, as of the date of the last such amendment, contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary in order to make the statements made therein, in the light of the circumstances under which they were made, not misleading. The Company has never been an issuer subject to Rule

144(i) under the Securities Act. The Company meets the registrant requirements for eligibility to use Form S-3 set forth in General Instruction I.A to Form S-3.

(b) Each of the consolidated financial statements (including, in each case, any notes thereto) contained in the SEC Filings, as amended, supplemented or restated, if applicable, was prepared in accordance with GAAP applied (except as may be indicated in the notes thereto and, in the case of unaudited quarterly financial statements, as permitted by the Form 10-Q under the Exchange Act) on a consistent basis throughout the periods indicated (except as may be indicated in the notes thereto), and each presented fairly, in all material respects, the consolidated financial position, results of operations and cash flows of the Company and the consolidated subsidiaries of the Company as of the respective dates thereof and for the respective periods indicated therein (subject, in the case of unaudited quarterly financial statements, to normal year-end adjustments).

(c) The Company and its subsidiaries have implemented and maintain a system of internal control over financial reporting (as required by Rule 13a-15(a) under the Exchange Act) that is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements in accordance with GAAP for external purposes and includes policies and procedures that (i) pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the Company, (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP and to maintain accountability of assets, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company, and (iii) provide reasonable assurance regarding the prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on its financial statements, and such system of internal control over financial reporting is reasonably effective.

(d) The Company has implemented and maintains disclosure controls and procedures (as defined in Rule 13a-15(d) of the Exchange Act) that are designed to ensure that information required to be disclosed by the Company in the reports it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time frames specified by the SEC's rules and forms (and such disclosure controls and procedures are reasonably effective), and has disclosed, based on its most recent evaluation of its system of internal control over financial reporting prior to the date of this Agreement, to the Company's independent registered accountant and the audit committee of the Board of Directors (A) any significant deficiencies and material weaknesses to the Company's knowledge in the design or operation of its internal control over financial reporting (as defined in Rule 13a-15(f) of the Exchange Act) and (B) to the Company's knowledge any fraud or allegation of fraud that involves management or other employees who have a significant role in the Company's internal control over financial reporting.

2.6 No Conflict; Required Filings and Consents.

(a) The execution and delivery of this Agreement by the Company does not, and the performance of this Agreement by the Company will not, (i) conflict with or violate any provision of the Governing Documents of the Company or its subsidiaries, (ii) conflict with or violate any law applicable to the Company or any of its subsidiaries or by which any property or asset of the Company or any of its subsidiaries is bound or affected or (iii) conflict with, or constitute a default (or an event which, with notice or lapse of time or both, would become a default) under, or give to others any rights of termination, amendment, acceleration or cancellation of, any a "material contract" (as such term is defined in Item 601(b)(10) of Regulation S-K of the SEC) (a "**Material Contract**") except for, in the case of each clause (ii) and (iii), conflicts, violations, or defaults, which, individually or in the aggregate, would not materially adversely affect the ability of Company to perform its obligations under this Agreement or to consummate the transactions contemplated hereby.

(b) The Company is not required to obtain any consent, waiver, authorization or order of, give any notice to, or make any filing or registration with, any federal, national, supranational, state, provincial, municipal, local or other government, governmental, regulatory or administrative authority, agency or commission or any court, tribunal, or judicial or arbitral body of competent jurisdiction ("**Governmental Authority**") or other Person in connection with the execution, delivery and performance by the Company of the issuance of the Securities, other than (i) (A) the filing of a registration statement with the SEC in accordance with the requirements of the Registration Rights Agreement, (B) filings required by applicable Blue Sky Laws, (C) the filing of any requisite notices to the Nasdaq Global Select Market for the issuance and sale of the Securities and the listing of the Shares and the Warrant Shares thereon in the time and manner required thereby and (D) those that have been made or obtained prior to the date of this Agreement, or (ii) where failure to obtain such consents, approvals, authorizations or permits, or to make such filings or notifications, would not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect.

2.7 Employees and Employee Matters. Except as would not reasonably be expected to have a Material Adverse Effect and except as set forth in the SEC Filings filed or furnished to the SEC after the end of the Company's most recently completed fiscal year through the date hereof (excluding any disclosure contained under the heading "Risk Factors" and in any "forward-looking statements" disclaimer or in any other precautionary statements, and in any exhibits thereto) (the "**SEC Disclosure**"), the Company and its subsidiaries has complied with all federal, state and local laws relating to the hiring of employees, consultants and advisors and the employment of labor, including provisions thereof relating to wages, hours, equal opportunity, collective bargaining and the payment of social security and other taxes. Neither the Company nor any of its subsidiaries is delinquent in material payments to any of its employees for any wages, salaries, commissions, bonuses or other direct compensation for any services performed by them to date or amounts required to be reimbursed to such employees or upon any termination of the employment of any such employees. In the past three years, no allegations of workplace misconduct or questionable business practices have been made in writing, or, to the Company's knowledge, threatened against or involving any current or former officer, director or member of the senior management of the Company.

2.8 Litigation. Except as set forth in the SEC Disclosure, there is no material action, suit or proceeding pending or, to the Company's knowledge, currently threatened against the Company or any of its subsidiaries or against any director, officer or employee of the Company or any of its subsidiaries, or, to the Company's knowledge, facts or circumstances that are reasonably likely to result in such an action, suit or proceeding. Neither the Company nor any of its subsidiaries is a party to, or subject to the provisions of, any order, writ, injunction, judgment or decree of any court or government agency or instrumentality. There is no material action, suit, proceeding or investigation by the Company or any of its subsidiaries currently pending or that the Company any of its subsidiaries intends to initiate. There has not been and, to the knowledge of the Company, there is not pending or contemplated in writing, any investigation by the SEC or other Governmental Authority involving the Company or any current or former director or officer of the Company.

2.9 Taxes. Except as would not reasonably be expected to have a Material Adverse Effect and except as set forth in the SEC Disclosure, (i) all federal, state and local tax returns, reports and declarations of the Company required by law to be filed have been duly filed, (ii) all taxes and other fees due thereon have been paid and (iii) the Company has set aside on its books provisions reasonably adequate for the payment of all material taxes for periods subsequent to the periods to which such returns, reports or declarations apply. There is no tax lien, whether imposed by any federal, state, county or local taxing authority, outstanding against the assets, properties or business of the Company or any of its subsidiaries. There are no unpaid taxes in any material amount claimed to be due by the taxing authority of any jurisdiction, and the officers of the Company know of no basis for any such claim.

2.10 Listing and Maintenance Requirements. The Common Stock is registered pursuant to Section 12(b) or 12(g) of the Exchange Act, and the Company has taken no action designed to, or which to its knowledge is reasonably likely to have the effect of, terminating the registration of the Common Stock under the Exchange Act nor has the Company received any notification that the SEC is contemplating terminating such registration. The Company has complied with the requirements of the Nasdaq Global Select Market for continued listing of the Common Stock thereon and has not received any notification that the Nasdaq Global Select Market is contemplating terminating such listing. The Company has no reason to believe that it will not upon issuance of the Shares and the Warrant Shares continue to be in compliance with all such listing and maintenance requirements. The issuance of the Shares and the Warrant Shares hereunder does not contravene the rules of the Nasdaq Global Select Market.

2.11 Offering Exemption. Based in part on the representations of Purchaser set forth in Section 3.3 below, the offer, sale and issuance of the Securities in conformity with the terms of this Agreement are exempt from the registration requirements of the Securities Act and are exempt from the qualification or registration requirements of applicable state securities laws. Neither the Company nor its affiliates, nor any agent on its or their behalf, (i) has engaged in any form of general solicitation or general advertising (within the meaning of Regulation D under the Securities Act) in connection with the transactions contemplated by this Agreement, (ii) has solicited or will solicit any offers to sell or has offered to sell or will offer to sell all or any part of the Shares or the Pre-Funded Warrant to any Person or Persons so as to bring the sale of the Shares or the Pre-Funded Warrant by the Company within the registration provisions of the Securities Act or any state securities laws or (iii) has issued any shares of Common Stock or

shares of any series of Preferred Stock or other securities or instruments convertible into, exchangeable for or otherwise entitling the holder thereof to acquire shares of Common Stock which would be integrated with the sale of the Shares or the Pre-Funded Warrant to Purchaser for purposes of the Securities Act or of any applicable stockholder approval provisions, including, without limitation, under the rules and regulations of any exchange or automated quotation system on which any of the securities of the Company are listed or designated, nor will the Company or any of its subsidiaries or affiliates take any action or steps that would require registration of any of the Shares or the Pre-Funded Warrant under the Securities Act.

2.12 Affiliate Transactions. No employee, officer, director or 10% or greater stockholder of the Company or member of his or her immediate family (each a "**Covered Person**") is currently indebted to the Company, nor is the Company indebted (or committed to make loans or extend or guarantee credit) to any Covered Person. Except as disclosed in the SEC Filings, as of the date hereof, no Covered Person has any direct or indirect ownership interest in any firm or corporation with which the Company is affiliated or with which the Company has a business relationship, or any firm or corporation that competes with the Company (except for ownership of stock not to exceed 1% of the outstanding capital stock of any publicly traded company that may compete with the Company).

2.13 Investment Company Act. The Company is not, and is not an Affiliate (as defined below) of, and after giving effect to the consummation of the transactions contemplated by this Agreement, will not be and will not be an Affiliate of, an "investment company" or an entity "controlled" by an "investment company," as such terms are defined in the Investment Company Act of 1940. For purposes of this Agreement, "**Affiliate**" shall mean any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

2.14 Compliance with Rule 506. None of the Company, any of its predecessors, any director, executive officer, other officer of the Company participating in the offering contemplated hereby, any beneficial owner of 20% or more of the Company's outstanding voting equity securities, calculated on the basis of voting power, nor any promoter (as that term is defined in Rule 405 under the Securities Act) connected with the Company in any capacity at the time of sale is disqualified from relying on Rule 506 of Regulation D under the Securities Act ("**Rule 506**") for any of the reasons stated in Rule 506(d) in connection with the issuance and sale of the Securities to Purchaser pursuant to this Agreement.

2.15 Material Changes; Undisclosed Events, Liabilities or Developments. Since the date of the latest financial statements included within the SEC Filings: (i) there has been no event, occurrence or development that has had or that could reasonably be expected to have a Material Adverse Effect, (ii) the Company has not incurred any material liabilities (contingent or otherwise) other than expenses incurred in the ordinary course of business consistent with past practice, (iii) the Company has not altered its method of accounting, (iv) the Company has not declared or made any dividend or distribution of cash or other property to the holders of its Common Stock or purchased, redeemed or made any agreements to purchase or redeem any shares of its capital stock and (v) the Company has not issued any equity securities to any officer, director or Affiliate, except pursuant to existing Company equity compensation

plans or upon the exercise of options or warrants previously reported on a Statement of Beneficial Ownership filed under Section 16 of the Exchange Act. Except for the issuance of the Securities contemplated by this Agreement, no event, liability, fact, circumstance, occurrence or development has occurred or exists or is reasonably expected to occur or exist with respect to the Company and its subsidiaries or their business, properties, operations, assets or financial condition, that would be required to be disclosed by the Company under applicable securities laws if the Company were publicly offering securities pursuant to an effective registration statement under the Securities Act at the time this representation is made or deemed made.

2.16 Labor Relations. Except as set forth in the SEC Disclosure, no material labor dispute exists or, to the knowledge of the Company, is threatened with respect to any of the employees of the Company or any of its subsidiaries, which could reasonably be expected to result in a Material Adverse Effect. None of the Company's or its subsidiaries' employees is a member of a union that relates to such employee's relationship with the Company or any such subsidiary, neither the Company nor any of its subsidiaries is a party to any collective bargaining agreement, and the Company believes that its and its subsidiaries' relationships with its or their employees are good. The Company and its subsidiaries are in compliance with all U.S. federal, state, local and foreign laws and regulations relating to employment and employment practices, terms and conditions of employment and wages and hours, except where the failure to be in compliance could not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect.

2.17 Environmental Matters. Except as set forth in the SEC Disclosure, the Company and its subsidiaries are in compliance with and have not received notice of any actual or potential liability under or relating to, or actual or potential violation of, applicable federal, state and local laws, rules and regulations relating to the use, treatment, storage and disposal of hazardous or toxic substances or waste and protection of health and safety or the environment which are applicable to its business (the "**Environmental Laws**"). The Company has not received notice of any actual or potential liability under or relating to, or actual or potential violation of, any Environmental Laws, including for the investigation or remediation of any release or threat of release of hazardous materials, and has no knowledge of any event or condition that would reasonably be expected to result in any such notice. The Company is not aware of any facts or issues regarding its compliance with Environmental Laws, or liabilities or other obligations under Environmental Laws, that, individually or in the aggregate, would reasonably be expected to have a Material Adverse Effect, and the Company does not anticipate material capital expenditures relating to any Environmental Laws.

2.18 Title to Assets; Intellectual Property Matters.

(a) Except as set forth in the SEC Disclosure, the Company or any of its subsidiaries, as applicable, has good and marketable title in all personal property owned by the Company or any such subsidiary that is material to the business of the Company and its subsidiaries, in each case free and clear of all liens, except for liens as do not materially affect the value of such property and do not materially interfere with the use made and proposed to be made of such property by the Company or any of its subsidiaries and liens for the payment of federal, state or other taxes, the payment of which is neither delinquent nor subject to penalties. Except as set forth in the SEC

Disclosure, any real property and facilities held under lease by the Company or any of its subsidiaries are held by it under valid, subsisting and enforceable leases with which the Company or any such subsidiary are in compliance.

(b) Except as set forth in the SEC Disclosure, the Company owns, possesses, licenses or has other rights to use, on reasonable terms, all patents, patent applications, trade and service marks, trade and service mark registrations, trade names, copyrights, licenses, inventions, trade secrets, technology, know-how and other intellectual property (collectively, the "**Intellectual Property**") necessary for the conduct of the Company's business as now conducted or as proposed in the SEC Filings to be conducted (the "**Company Intellectual Property**"). To the knowledge of the Company, there are no rights of third parties to any Company Intellectual Property, other than as licensed by the Company. To the knowledge of the Company, there is no infringement by third parties of any Company Intellectual Property. There is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the Company's rights in or to any Company Intellectual Property. There is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the validity or scope of any Company Intellectual Property. There is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others that the Company infringes or otherwise violates any patent, trademark, copyright, trade secret or other proprietary rights of others. The Company is not aware of any facts required to be disclosed to the U.S. Patent and Trademark Office ("**USPTO**") that have not been disclosed to the USPTO and that would preclude the grant of a patent in connection with any patent application of the Company Intellectual Property or could form the basis of a finding of invalidity with respect to any issued patents of the Company Intellectual Property.

2.19 Insurance. The Company and its subsidiaries are insured by insurers of recognized financial responsibility against such losses and risks and in such amounts as are prudent and customary in the business in which the Company and its subsidiaries are engaged, including, but not limited to, directors' and officers' insurance. The Company does not have any reason to believe that it will not be able to renew its existing insurance coverage as and when such coverage expires or to obtain similar coverage from similar insurers as may be necessary to continue its business without a significant increase in cost.

2.20 Registration Rights. Except as provided for in the Registration Rights Agreement, no Person has any right to cause the Company to effect the registration under the Securities Act of any securities of the Company.

2.21 Application of Takeover Protections. The Company and the Board of Directors have taken all necessary action, if any, in order to render inapplicable any control share acquisition, business combination, poison pill (including any distribution under a rights agreement) or other similar anti-takeover provision under the Company's certificate of incorporation or the laws of its state of incorporation that is or could become applicable to Purchaser as a result of Purchaser and the Company fulfilling their obligations or exercising their rights under this Agreement, including without limitation as a result of the Company's issuance of the Securities and Purchaser's ownership of the Securities and the Warrant Shares.

2.22 Accountants. The Company's independent registered public accounting firm is currently KPMG, LLP and was Rose, Snyder & Jacobs LLP for the fiscal years ended September 30, 2022 and 2023. Such accounting firms are registered public accounting firms, as required by the Exchange Act. There are no disagreements of any kind presently existing or reasonably anticipated by the Company to arise between the Company and such accounting firms.

2.23 Compliance with Laws.

(a) Except as set forth in the SEC Disclosure, (i) the Company is and has been in compliance, in all material respects, with statutes, laws, ordinances, rules and regulations applicable to the Company for the ownership, testing, development, manufacture, packaging, processing, use, labeling, storage, or disposal of any product manufactured by or on behalf of the Company or out-licensed by the Company (a "**Company Product**"), including without limitation, the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 301, et seq., the Public Health Service Act, 42 U.S.C. § 262, similar laws of other Governmental Authorities and the regulations promulgated pursuant to such laws (collectively, "**Applicable Laws**"); (ii) the Company possesses all material licenses, certificates, approvals, authorizations, permits and supplements or amendments thereto required by any such Applicable Laws and/or for the ownership of its properties or the conduct of its business as it relates to a Company Product and as described in the SEC Filings (collectively, "**Authorizations**") and such Authorizations are valid and in full force and effect and the Company is not in violation of any term of any such Authorizations; (iii) the Company has not received any written notice of adverse finding, warning letter or other written correspondence or notice from the U.S. Food and Drug Administration (the "**FDA**") or any other Governmental Authority alleging or asserting noncompliance with any Applicable Laws or Authorizations relating to a Company Product; (iv) the Company has not received written notice of any ongoing claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action from any Governmental Authority or third party alleging that any Company Product, operation or activity related to a Company Product is in violation of any Applicable Laws or Authorizations or has any knowledge that any such Governmental Authority or third party is considering any such claim, litigation, arbitration, action, suit, investigation or proceeding, nor, to the Company's knowledge, has there been any material noncompliance with or violation of any Applicable Laws by the Company that would reasonably be expected to require the issuance of any such written notice or result in an investigation, corrective action, or enforcement action by the FDA or similar Governmental Authority with respect to a Company Product; (v) the Company has not received written notice that any Governmental Authority has taken, is taking or intends to take action to limit, suspend, modify or revoke any Authorizations or has any knowledge that any such Governmental Authority has threatened or is considering such action with respect to a Company Product; and (vi) the Company has filed, obtained, maintained or submitted all material reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments as required by any Applicable Laws or Authorizations and that all such reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were complete, correct and not

misleading on the date filed (or were corrected or supplemented by a subsequent submission).

(b) Except as set forth in the SEC Disclosure, to the Company's knowledge, neither the Company nor any of its directors, officers, employees or agents, has made, or caused the making of, any false statements on, or material omissions from, any other records or documentation prepared or maintained to comply with the requirements of the FDA or any other Governmental Authority.

(c) Except as set forth in the SEC Disclosure, the clinical studies and tests conducted by the Company or on behalf of the Company, have been and, if still pending, are being conducted in all material respects pursuant to all Applicable Laws and Authorizations; the descriptions of the results of such clinical studies and tests contained in the SEC Filings are accurate and complete in all material respects and fairly present the data derived from such clinical studies and tests; the Company is not aware of any clinical studies or tests, the results of which the Company believes reasonably call into question the research, nonclinical or clinical study or test results described or referred to in the SEC Filings when viewed in the context in which such results are described; and the Company has not received any written notices or correspondence from any Governmental Authority requiring the termination, suspension or material modification of any clinical study or test conducted by or on behalf of the Company.

2.24 Anti-Bribery and Anti-Money Laundering Laws. Each of the Company, its subsidiaries and, to the knowledge of the Company, any of their respective officers, directors, supervisors, managers, agents, or employees are and have at all times been in compliance with and its participation in the offering will not violate: (a) anti-bribery laws, including but not limited to, any applicable law, rule, or regulation of any locality, including but not limited to any law, rule, or regulation promulgated to implement the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, signed December 17, 1997, including the U.S. Foreign Corrupt Practices Act of 1977, as amended, the U.K. Bribery Act 2010, or any other law, rule or regulation of similar purposes and scope or (b) anti-money laundering laws, including, but not limited to, applicable federal, state, international, foreign or other laws, regulations or government guidance regarding anti-money laundering, including, without limitation, Title 18 U.S. Code Sections 1956 and 1957, the Patriot Act, the Bank Secrecy Act, and international anti-money laundering principles or procedures by an intergovernmental group or organization, such as the Financial Action Task Force on Money Laundering, of which the United States is a member and with which designation the United States representative to the group or organization continues to concur, all as amended, and any executive order, directive, or regulation pursuant to the authority of any of the foregoing, or any orders or licenses issued thereunder.

2.25 Cybersecurity. Except as set forth in the SEC Disclosure, the Company and its subsidiaries' information technology assets and equipment, computers, systems, networks, hardware, software, websites, applications, and databases (collectively, "**IT Systems**") are adequate for, and operate and perform in all material respects as required in connection with the operation of the business of the Company and its subsidiaries as currently conducted, and are free and clear of all material Trojan horses, time bombs, malware and other malicious code.

Except as set forth in the SEC Disclosure, the Company and its subsidiaries have implemented and maintained commercially reasonable physical, technical and administrative controls designed to maintain and protect the confidentiality, integrity, availability, privacy and security of all sensitive, confidential or regulated data ("**Confidential Data**") used or maintained in connection with their businesses and Personal Data (defined below), and the integrity, availability continuous operation, redundancy and security of all IT Systems. "**Personal Data**" means the following data used in connection with the Company's and its subsidiaries' businesses and in their possession or control: (i) a natural person's name, street address, telephone number, e-mail address, photograph, social security number or other tax identification number, driver's license number, passport number, credit card number or bank information; (ii) information that identifies or may reasonably be used to identify an individual; (iii) any information that would qualify as "protected health information" under the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act (collectively, "**HIPAA**"); and (iv) any information that would qualify as "personal data," "personal information" (or similar term) under the Privacy Laws. Except as set forth in the SEC Disclosure, to the Company's knowledge, there have been no breaches, outages or unauthorized uses of or accesses to the Company's IT Systems, Confidential Data, or Personal Data that would require notification under Privacy Laws (as defined below).

2.26 Compliance with Data Privacy Laws. Except as set forth in the SEC Disclosure, the Company and its subsidiaries are, and at all prior times were, in material compliance with all applicable state, federal and foreign data privacy and security laws and regulations regarding the collection, use, storage, retention, disclosure, transfer, disposal, or any other processing (collectively "**Processing**") of Personal Data, including without limitation HIPAA, the EU General Data Protection Regulation (Regulation (EU) No. 2016/679), all other local, state, federal, national, supranational and foreign laws relating to the regulation of the Company or its subsidiaries, and the regulations promulgated pursuant to such statutes and any state or non-U.S. counterpart thereof (collectively, the "**Privacy Laws**"). To ensure material compliance with the Privacy Laws, the Company and its subsidiaries have in place, comply with, and take all appropriate steps necessary to ensure compliance in all material respects with their policies and procedures relating to data privacy and security, and the Processing of Personal Data and Confidential Data (the "**Privacy Statements**"). The Company and its subsidiaries have, except as would not reasonably be expected, individually or in the aggregate, to result in a Material Adverse Effect, at all times since inception provided accurate notice of their Privacy Statements then in effect to its customers, employees, third party vendors and representatives. None of such disclosures made or contained in any Privacy Statements have been materially inaccurate, misleading, incomplete, or in material violation of any Privacy Laws.

2.27 Brokers. There is no investment banker, broker, finder, financial advisor, placement agent or other Person that has been retained by or is authorized to act on behalf of the Company or any of its subsidiaries that might be entitled to any fee or commission in connection with the transactions contemplated by this Agreement.

2.28 Suppliers and Customers. Neither the Company nor any of its subsidiaries has any knowledge of any termination, cancellation or threatened termination or cancellation or limitation of, or any material dissatisfaction with, the business relationship between the Company or any such subsidiary and any material supplier, customer, vendor, customer or client.

2.29 Acknowledgement. The Company acknowledges and agrees that Purchaser is acting solely in the capacity of an arm's length purchaser with respect to this Agreement and the transactions contemplated hereby. The Company further acknowledges that Purchaser is not acting as a financial advisor or fiduciary of the Company (or in any similar capacity) with respect to this Agreement and the transactions contemplated hereby and any advice given by Purchaser or any of their respective representatives or agents in connection with this Agreement and the transactions contemplated hereby is merely incidental to Purchaser's purchase of the Securities. The Company further represents to Purchaser that the Company's decision to enter into this Agreement has been based solely on the independent evaluation of the transactions contemplated hereby by the Company and its representatives.

2.30 Regulation M Compliance. The Company has not, and to its knowledge no one acting on its behalf has, (a) taken, directly or indirectly, any action designed to cause or to result in the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of any of the Shares or the Pre-Funded Warrant, (b) sold, bid for, purchased, or paid any compensation for soliciting purchases of, any of the Shares or the Pre-Funded Warrant, or (c) paid or agreed to pay to any Person any compensation for soliciting another to purchase any other securities of the Company.

3. REPRESENTATIONS AND WARRANTIES OF PURCHASER

As of the date hereof and as of the Closing, Purchaser represents and warrants to the Company that the statements contained in this Section 3 are true, complete and correct:

3.1 Authorization; Enforceability. Purchaser has the requisite corporate power and authority to execute, deliver and perform this Agreement. All action on the part of Purchaser and, as applicable, its officers and directors necessary for the authorization, execution, delivery and performance of all obligations of Purchaser under this Agreement has been taken. This Agreement constitutes the valid and legally binding obligations of Purchaser, enforceable in accordance with their terms, except as limited by the Equitable Exceptions.

3.2 No Conflict; Required Filings and Consents.

(a) The execution and delivery of this Agreement by Purchaser does not, and the performance of this Agreement by Purchaser will not, (i) conflict with or violate any provision of the Governing Documents of Purchaser, (ii) conflict with or violate any law applicable to Purchaser or by which any property or asset of Purchaser is bound or affected or (iii) conflict with, or constitute a default (or an event which, with notice or lapse of time or both, would become a default) under, or give to others any rights of termination, amendment, acceleration or cancellation of, any Material Contract except for, in the case of each clause (ii) and (iii), conflicts, violations, or defaults, which, individually or in the aggregate, would not materially adversely affect the ability of Purchaser to perform its obligations under this Agreement or to consummate the transactions contemplated hereby.

(b) Purchaser is not required to obtain any consent, waiver, authorization or order of, give any notice to, or make any filing or registration with, any

Governmental Authority or other Person in connection with the execution, delivery and performance by Purchaser of its obligations under this Agreement, other than (i) any filing required under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended, or other Merger Control Laws, or (ii) where failure to obtain such consents, approvals, authorizations or permits, or to make such filings or notifications, would not, individually or in the aggregate, would not materially adversely affect the ability of Purchaser to perform its obligations under this Agreement or to consummate the transactions contemplated hereby.

3.3 Investor Representations.

(a) The Securities acquired by Purchaser hereunder will be acquired by Purchaser for its own account for investment purposes and not with a view to distribution in violation of the Securities Act. Purchaser does not presently have any contract, undertaking or agreement with any Person to sell, transfer or grant participation rights to such Person or to any other Person with respect to any of the Securities acquired by Purchaser hereunder.

(b) Purchaser is an "accredited investor" within the meaning of Rule 501(a) promulgated under the Securities Act.

(c) Purchaser acknowledges and agrees that the Securities are being offered in a transaction not involving any public offering within the meaning of the Securities Act, and Purchaser understands that the Securities have not been registered under the Securities Act, by reason of their issuance by the Company in a transaction exempt from the registration requirements of the Securities Act, and that the Securities must continue to be held and may not be offered, resold, transferred, pledged or otherwise disposed of by Purchaser unless a subsequent disposition thereof is registered under the Securities Act or is exempt from such registration and in each case in accordance with any applicable securities laws of any state of the United States. Purchaser understands that the exemptions from registration afforded by Rule 144 (the provisions of which are known to it) promulgated under the Securities Act depend on the satisfaction of various conditions including, but not limited to, the time and manner of sale, the holding period and on requirements relating to the Company which are outside of Purchaser's control and which the Company may not be able to satisfy, and that, if applicable, Rule 144 may afford the basis for sales only in limited amounts. Purchaser acknowledges and agrees that it has been advised to consult legal counsel prior to making any offer, resale, transfer, pledge or disposition of any of the Shares. Purchaser acknowledges that no federal or state agency has passed upon or endorsed the merits of the offering of the Securities or made any findings or determination as to the fairness of this investment.

(d) Purchaser understands that any certificates or book entry notations evidencing the Shares may bear the following legend:

"THE SECURITIES REPRESENTED HEREBY HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS

AMENDED (THE "SECURITIES ACT"), OR THE SECURITIES LAWS OF ANY STATE OF THE UNITED STATES. THE SECURITIES HAVE BEEN ACQUIRED FOR INVESTMENT AND MAY NOT BE SOLD, TRANSFERRED OR ASSIGNED UNLESS (I) SUCH SECURITIES HAVE BEEN REGISTERED FOR SALE PURSUANT TO THE SECURITIES ACT, (II) SUCH SECURITIES MAY BE SOLD PURSUANT TO RULE 144, (III) THE COMPANY HAS RECEIVED AN OPINION OF COUNSEL REASONABLY SATISFACTORY TO IT THAT SUCH TRANSFER MAY LAWFULLY BE MADE WITHOUT REGISTRATION UNDER THE SECURITIES ACT, OR (IV) THE SECURITIES ARE TRANSFERRED WITHOUT CONSIDERATION TO AN AFFILIATE OF SUCH HOLDER OR A CUSTODIAL NOMINEE (WHICH FOR THE AVOIDANCE OF DOUBT SHALL REQUIRE NEITHER CONSENT NOR THE DELIVERY OF AN OPINION)."

(e) Purchaser understands that the Pre-Funded Warrant may bear the following legend:

"THE SECURITIES REPRESENTED HEREBY AND THE SECURITIES ISSUABLE UPON EXERCISE OF THESE SECURITIES HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), OR THE SECURITIES LAWS OF ANY STATE OF THE UNITED STATES. THE SECURITIES AND THE SECURITIES ISSUABLE UPON EXERCISE OF THESE SECURITIES HAVE BEEN ACQUIRED FOR INVESTMENT AND MAY NOT BE SOLD, TRANSFERRED OR ASSIGNED UNLESS (I) SUCH SECURITIES HAVE BEEN REGISTERED FOR SALE PURSUANT TO THE SECURITIES ACT, (II) SUCH SECURITIES MAY BE SOLD PURSUANT TO RULE 144, (III) THE COMPANY HAS RECEIVED AN OPINION OF COUNSEL REASONABLY SATISFACTORY TO IT THAT SUCH TRANSFER MAY LAWFULLY BE MADE WITHOUT REGISTRATION UNDER THE SECURITIES ACT, OR (IV) THE SECURITIES ARE TRANSFERRED WITHOUT CONSIDERATION TO AN AFFILIATE OF SUCH HOLDER OR A CUSTODIAL NOMINEE (WHICH FOR THE AVOIDANCE OF DOUBT SHALL REQUIRE NEITHER CONSENT NOR THE DELIVERY OF AN OPINION)."

(f) Purchaser acknowledges and agrees that it can bear the economic risk and complete loss of its investment in the Securities and has such knowledge and experience in financial or business matters that it is capable of evaluating the merits and risks of the investment in the Securities.

(g) Purchaser is not relying and has not relied on any representations or warranties whatsoever regarding the subject matter of this Agreement, express or implied, except for the representations and warranties in Section 2. Such representations and warranties by the Company constitute the sole and exclusive representations and

warranties of the Company in connection with the transactions contemplated by this Agreement and Purchaser understands, acknowledges and agrees that all other representations and warranties of any kind or nature whether express, implied or statutory are specifically disclaimed by the Company.

(h) In connection with the due diligence investigation of the Company by Purchaser and its Affiliates, stockholders, directors, officers, employees, agents, representatives or advisors, Purchaser and its Affiliates, stockholders, directors, officers, employees, agents, representatives and advisors have received and may continue to receive after the date hereof from the Company and its Affiliates, stockholders, directors, officers, employees, consultants, agents, representatives and advisors certain estimates, projections, forecasts and other forward-looking information, as well as certain business plan information, regarding the Company and its business and operations. Purchaser hereby acknowledges that there are uncertainties inherent in attempting to make such estimates, projections, forecasts and other forward-looking statements, as well as in such business plans, and that Purchaser will have no claim against the Company, or any of its Affiliates, stockholders, directors, officers, employees, consultants, agents, representatives or advisors, or any other Person with respect thereto unless any such information is expressly addressed or included in a representation or warranty contained in this Agreement. Accordingly, Purchaser hereby acknowledges and agrees that neither the Company nor any of its respective Affiliates, stockholders, directors, officers, employees, consultants, agents, representatives or advisors, nor any other Person, has made or is making any express or implied representation or warranty with respect to such estimates, projections, forecasts, forward-looking statements or business plans unless any such information is expressly addressed or included in a representation or warranty contained in this Agreement.

(i) Purchaser understands that nothing in this Agreement or any other materials presented by or on behalf of the Company to Purchaser in connection with the purchase of the Securities constitutes legal, tax or investment advice. Purchaser has consulted such legal, tax and investment advisors as it, in such Purchaser's sole discretion, has deemed necessary or appropriate in connection with its purchase of the Securities.

3.4 Brokers. There is no investment banker, broker, finder, financial advisor, placement agent or other Person that has been retained by or is authorized to act on behalf of Purchaser that might be entitled to any fee or commission in connection with the transactions contemplated by this Agreement.

3.5 Compliance with Laws. Neither Purchaser nor, to Purchaser's knowledge, any director, officer, agent, employee or Person acting on behalf of Purchaser, is currently subject to any U.S. sanctions administered by the Office of Foreign Assets Control of the U.S. Treasury Department.

4. CONDITIONS TO PURCHASER'S OBLIGATIONS AT CLOSING

The obligations of Purchaser under this Agreement to purchase and pay for the Securities being purchased by Purchaser at Closing are subject to the satisfaction or waiver of the following conditions:

4.1 Representations and Warranties. (i) The representations and warranties of the Company contained in Section 2.1, Section 2.2, Section 2.3, Section 2.4, Section 2.5, Section 2.6, Section 2.11, Section 2.14, Section 2.29 and Section 2.30 of this Agreement shall be true, correct and complete in all material respects on and as of Closing except those representations and warranties qualified by materiality, which shall be true and correct in all respects (except that those representations and warranties which address matters only as of a particular date need only be measured as of the specific date) and (ii) the representations and warranties of the Company in Section 2.7, Section 2.8, Section 2.9, Section 2.10, Section 2.12, Section 2.13 and Sections 2.15 through 2.28 of this Agreement shall be true, correct and complete on and as of Closing, except that any inaccuracies in such representations and warranties will be disregarded if they collectively do not constitute and would not reasonably be expected to have a Material Adverse Effect on the Company (it being understood that for purposes of determining the accuracy of any representation or warranties all Material Adverse Effect and other materiality qualifications contained in such representations and warranties will be disregarded).

4.2 Performance. The Company shall have performed and complied in all material respects with all other conditions, covenants and agreements contained in this Agreement required to be performed or complied with by it on or before the Closing and no Material Adverse Effect or event that would reasonably be expected to result in a Material Adverse Effect shall have occurred.

4.3 Legal Investment. On the date of the applicable Closing, the sale and issuance of the Shares shall be legally permitted by all laws and regulations to which Purchaser and the Company are subject.

4.4 No Suspension. Trading in the Common Stock shall not have been suspended by the SEC or the Nasdaq Global Select Market. The Shares and the Warrant Shares shall be eligible for listing on the Nasdaq Global Select Market.

4.5 Qualifications. All authorizations, approvals or permits, if any, of any Governmental Authority that are required in connection with the lawful issuance and sale of the Securities pursuant to this Agreement shall have been duly obtained and shall be effective on and as of the applicable Closing.

4.6 No Injunction. No statute, rule, regulation, executive order, decree, ruling or injunction shall have been enacted, entered, promulgated or endorsed by any Governmental Authority of competent jurisdiction which prohibits the consummation of any of the transactions contemplated by this Agreement.

4.7 Compliance Certificate. An officer or other authorized representative of the Company shall have delivered to Purchaser at the Closing a certificate certifying that the conditions specified in Sections 4.1 and 4.2 have been fulfilled.

4.8 Other Agreements. The Registration Rights Agreement and the Pre-Funded Warrant shall have been executed by the Company and delivered to Purchaser.

5. CONDITIONS TO THE COMPANY'S OBLIGATIONS AT CLOSING

The obligations of the Company under this Agreement to sell and issue to Purchaser the Securities to be purchased by Purchaser at Closing are subject to the satisfaction or waiver, at or prior to the applicable Closing, of the following conditions:

5.1 Representations and Warranties. The representations and warranties of Purchaser contained in Section 3 shall be true, correct and complete in all material respects on and as of the Closing with the same force and effect as if they had been made at such time (except that those representations and warranties which address matters only as of a particular date need only be true, correct and complete in all material respects as of such date).

5.2 Performance. Purchaser shall have performed and complied in all material respects with all other conditions, covenants and agreements contained in this Agreement required to be performed or complied with by Purchaser on or before the Closing.

5.3 No Injunction. No statute, rule, regulation, executive order, decree, ruling or injunction shall have been enacted, entered, promulgated or endorsed by any Governmental Authority of competent jurisdiction which prohibits the consummation of any of the transactions contemplated by this Agreement.

6. COVENANTS

6.1 Commercial Reasonable Efforts. Each party will use commercially reasonable efforts to satisfy in a timely fashion each of the conditions to be satisfied by it under this Agreement.

6.2 Securities Laws Disclosure; Publicity. The Company shall, by 9:00 a.m. (New York City time) on the Business Day following the date hereof, issue a press release disclosing all material, non-public information delivered to Purchaser by the Company, any Subsidiary or any of their respective officers, directors, employees or agents in connection with the transactions contemplated hereby, and shall, by 5:30 p.m. (New York City time) on the Business Day following the date hereof, file a Current Report on Form 8-K (or its Annual Report on Form 10-K in lieu thereof) disclosing the material terms of the transactions contemplated hereby (and including as exhibits to such filing this Agreement, the Registration Rights Agreement and the form of Pre-Funded Warrant). The Company and Purchaser shall consult with each other regarding the substance of any public disclosure by either party regarding this Agreement and regarding the issuance of any other press releases with respect to the transactions contemplated hereby, and neither the Company nor Purchaser shall issue any such press release nor otherwise make any such public statement without the prior consent of the Company, with respect to any press release of Purchaser, or without the prior consent of Purchaser, with respect to any press release of the Company, which consent shall not unreasonably be withheld or delayed, except if such disclosure is required by law, rule or regulation, in which case the disclosing party shall promptly provide the other party with prior notice of such public statement or communication. Notwithstanding the foregoing, the Company shall not publicly disclose the

name of Purchaser, or include the name of Purchaser or an Affiliate of Purchaser, without the prior written consent of Purchaser (i) in any press release or marketing materials, (ii) in any filing with the SEC (other than the registration statement filed pursuant to the Registration Rights Agreement) or any regulatory agency or the Nasdaq Global Select Market, except with respect to clause (ii) as required by U.S. federal securities law in connection with (A) any registration statement contemplated by the Registration Rights Agreement or (B) the filing of final versions of this Agreement, the Registration Rights Agreement and the Pre-Funded Warrant (including signature pages thereto) with the SEC or (iii) to the extent such disclosure is required by law, request of the SEC's staff or the Nasdaq Global Select Market regulations, in which case the Company shall provide Purchaser with prior written notice of and an opportunity to review such disclosure permitted under subclause (iii). From and after the issuance of the press release, Purchaser shall not be in possession of any material, non-public information received from the Company, any Subsidiary or any of their respective officers, directors, employees or agents. In addition, effective upon the issuance of such press release, the Company acknowledges and agrees that any and all confidentiality or similar obligations under this Agreement, or an agreement entered into in connection with the transactions contemplated hereby, whether written or oral, between the Company, any of its Subsidiaries or any of their respective officers, directors, agents, employees or Affiliates, on the one hand, and Purchaser or any of its officers, directors, agents, employees or investment advisers, on the other hand, shall terminate.

6.3 Book Entry Statement. The Company hereby agrees to deliver to Purchaser a book entry statement from the Transfer Agent showing the Shares registered in the name of Purchaser within three Business Days of the Closing.

6.4 Market Listing. From the date hereof through the Closing, the Company shall use reasonable best efforts to (a) maintain the listing and trading of the Common Stock on the Nasdaq Global Select Market and (b) effect the listing of the Shares and the Warrant Shares on the Nasdaq Global Select Market, including submitting a Notification Form: Listing of Additional Shares as required by the rules of the Nasdaq Global Select Market.

7. TERMINATION

7.1 Termination. This Agreement may be terminated at any time:

(a) by the mutual written consent of Purchaser and the Company; or

(b) by either Purchaser or the Company in the event that any court of competent jurisdiction or Governmental Authority shall have issued an order, decree or ruling or taken any other action restraining, enjoining or otherwise prohibiting the actions contemplated hereby and such order, decree, ruling or other action shall have become final and non-appealable.

7.2 Effect of Termination. In the event of any termination of this Agreement as provided in Section 7.1, this Agreement shall forthwith become wholly void and of no further force and effect; *provided* that nothing herein shall relieve any party from liability for willful breach of this Agreement.

8. GENERAL

8.1 Successors and Assigns. Except as otherwise provided herein, the terms and conditions of this Agreement shall inure to the benefit of and be binding upon the respective successors and permitted assigns of the parties (including any permitted transferees of any Shares, the Pre-Funded Warrant or the Warrant Shares). Purchaser and the Company may not assign their respective rights or obligations under this Agreement, in whole or in part, except with the consent of the other party; *provided, however*, the rights and obligations of Purchaser may be assigned, without the prior written consent of the Company, to one or more of Purchaser's Affiliates. Any attempted assignment made in contravention of this Agreement shall be null and void and of no force or effect.

8.2 Entire Agreement. This Agreement and the documents, schedules and exhibits referred to herein or therein constitute the entire agreement between the parties and supersede all prior communications, representations, understandings and agreements of the parties with respect to the subject matter hereof and thereof. No party shall be liable or bound to any other party in any manner by any warranties, representations or covenants except as specifically set forth herein or therein. All schedules and exhibits hereto are hereby incorporated herein by reference. Nothing in this Agreement, express or implied, is intended to confer upon any third party any rights, remedies, obligations or liabilities under or by reason of this Agreement, except as expressly provided in this Agreement.

8.3 General Interpretation; Defined Terms. The terms of this Agreement have been negotiated by the parties hereto and the language used in this Agreement shall be deemed to be the language chosen by the parties hereto to express their mutual intent. This Agreement shall be construed without regard to any presumption or rule requiring construction against the party causing such instrument or any portion thereof to be drafted, or in favor of the party receiving a particular benefit under this Agreement. No rule of strict construction will be applied against any Person.

8.4 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of New York, without regard to the principles of conflicts of law thereof.

8.5 Jurisdiction. The parties hereby irrevocably and unconditionally submit to the jurisdiction of the United States District Court for the Southern District of New York for the purpose of any suit, action or other proceeding arising out of or based upon this Agreement.

8.6 Counterparts. This Agreement may be executed in any number of counterparts and by the parties hereto in separate counterparts, each of which when so executed shall be deemed to be an original and all of which taken together shall constitute one and the same agreement, and may be delivered to the other parties hereto by facsimile.

8.7 Section Headings and References. The section headings contained herein are for the convenience of the parties and in no way alter, modify, amend, limit or restrict the contractual obligations of the parties. When a reference is made in this Agreement to a Section or Exhibit, such reference is to a Section or Exhibit of or to this Agreement unless otherwise

indicated. The words "hereof," "herein," "hereto" and "hereunder" and words of similar import, when used in this Agreement, shall refer to this Agreement as a whole and not to any particular provision of this Agreement. The terms defined in the singular has a comparable meaning when used in the plural, and vice versa. References to a Person are also to its successors and permitted assigns. References to an agreement are to such agreement as amended, restated, modified or otherwise supplemented, from time to time. The term "dollars" and "$" means United States dollars. The word "including" means "including without limitation" and the words "include" and "includes" have corresponding meanings.

8.8 Severability. If any term of provision of this Agreement is determined to be illegal, unenforceable or invalid in whole or in part for any reason, such illegal, unenforceable or invalid provisions or party thereof shall be stricken from this Agreement, and such provision shall not affect the legality, enforceability or validity of the remainder of this Agreement. If any provision or part thereof of this Agreement is stricken in accordance with the provisions of this Section 8.8, then such stricken provision shall be replaced, to extent possible, with a legal, enforceable and valid provision that is as similar in tenor to the stricken provision as is legally possible.

8.9 Notices. All notices and other communications given or made pursuant hereto will be in writing and will be deemed to have been duly given on the date delivered, if delivered personally, or on the next Business Day after being sent by reputable overnight courier (with delivery tracking provided, signature required, and delivery prepaid), in each case, to the Parties at the following addresses, or on the date sent and confirmed by confirmatory return email to the email address specified below or at such other address, or email address for a Party as will be specified by notice given in accordance with this Section 8.9.

If to the Company:

Arrowhead Pharmaceuticals, Inc.
117 E. Colorado Blvd., Suite 700
Pasadena, CA 91105
Attention: General Counsel
Email: General.Counsel@arrowheadpharma.com

With a copy to:

Gibson, Dunn & Crutcher LLP
One Embarcadero Center, Suite 2600
San Francisco, CA 94111
Attention: Ryan Murr
Email: rmurr@gibsondunn.com

If to Purchaser:

Avoro Life Sciences Fund LLC
110 Greene Street, Suite 800

New York, NY 10012
Attention: Scott Epstein
Email: SEpstein@avorocapital.com

8.10 Amendments and Waivers. Except as otherwise expressly set forth in this Agreement, any term of this Agreement may be amended and the observance of any term of this Agreement may be waived (either generally or in a particular instance and either retroactively or prospectively), only with the written consent of each party hereto (with respect to an amendment) and the written consent of each party from whom a waiver is sought (with respect to a waiver). No waiver of any provision or consent to any action shall constitute a waiver of any other provision or consent to any other action, whether or not similar. No waiver or consent shall constitute a continuing waiver or consent or commit a party to provide a waiver in the future except to the extent specifically set forth in writing.

8.11 Expenses. Each party hereto will pay its own expenses in connection with the transactions contemplated by this Agreement.

8.12 Persons Entitled to Benefits of Agreement. This Agreement is intended for the benefit of the parties hereto and their respective permitted successors and assigns and is not for the benefit of, nor may any provision hereof be enforced by, any other person.

8.13 Further Assurances. The Company and Purchaser shall use their commercially reasonable efforts, in the most expeditious manner practicable, to satisfy or cause to be satisfied the intent and purposes of this Agreement by executing and delivering such instruments, documents and other writings as may be reasonably necessary or desirable.

[*signature pages follow*]

IN WITNESS WHEREOF, the undersigned parties have duly executed this Common Stock Purchase Agreement effective as of the date first above written.

COMPANY:

ARROWHEAD PHARMACEUTICALS, INC.

By: /s/ Christopher Anzalone, PhD
Name: Christopher Anzalone, PhD
Title: President and Chief Executive Officer

PURCHASER:

AVORO LIFE SCIENCES FUND LLC

By: /s/ Scott Epstein
Name: Scott Epstein
Title: Partner, Chief Operating Officer & Chief Compliance Officer

Number of Shares	0
Number of Pre-Funded Warrants	917,441

Exhibit A

Form of Pre-Funded Warrant

Exhibit B

Registration Rights Agreement

REGISTRATION RIGHTS AGREEMENT

This Registration Rights Agreement (this "**Agreement**") is made and entered into as of [●], 2024, by and between Arrowhead Pharmaceuticals, Inc., a Delaware corporation (the "**Company**"), and Avoro Life Sciences Fund LLC, a Delaware limited liability company (the "**Purchaser**").

NOW, THEREFORE, IN CONSIDERATION of the mutual covenants contained in this Agreement, and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the Company and the Purchaser agree as follows:

ARTICLE I

DEFINITIONS

Section 1.1. Definitions. As used in this Agreement, the following terms shall have the following meanings:

(a) "**Adverse Disclosure**" means public disclosure of material non-public information that, in the good faith judgment of the board of directors of the Company: (i) would be required to be made in such Registration Statement filed with the SEC by the Company so that such Registration Statement, from and after its effective date, does not contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading; (ii) would not be required to be made at such time but for the filing, effectiveness or continued use of such Registration Statement; and (iii) the Company has a bona fide business purpose for not disclosing publicly.

(b) "**Affiliate**" means, with respect to any Person, another Person that controls, is controlled by or is under common control with such Person; *provided*, that with respect to the Purchaser, the term "Affiliate" shall not include any employee benefit plan of Purchaser. A Person shall be deemed to control another Person if such Person possesses, directly or indirectly, the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of voting securities, by contract or otherwise. For the purposes of this Agreement, in no event shall the Purchaser or any of its Affiliates be deemed Affiliates of the Company or any of its Affiliates, nor shall the Company or any of its Affiliates be deemed Affiliates of the Purchaser or any of its Affiliates.

(c) "**Agreement**" has the meaning set forth in the preamble.

(d) "**Business Day**" means any day except Saturday, Sunday and any legal holiday or a day on which banking institutions in Pasadena, California generally are authorized or required by law or other governmental actions to close.

(e) "**Closing**" means the date of the purchase and sale of the Shares and the Pre-Funded Warrant pursuant to the Purchase Agreement.

(f) "**Common Stock**" means the common stock of the Company, par value $0.001 per share.

(g) "**Company Indemnitee**" has the meaning set forth in Section 2.8.

(h) "**Effectiveness Period**" has the meaning set forth in Section 2.1.3.

(i) "**Exchange Act**" means the Securities Exchange Act of 1934, as amended, as in effect from time to time.

(j) "**Filing Deadline**" has the meaning set forth in Section 2.1.1.

(k) "**FINRA**" means the Financial Industry Regulatory Authority.

(l) "**Holder**" or "**Holders**" means the Purchaser, or such other holder or holders, as the case may be, from time to time of Registrable Securities.

(m) "**Initial Registration Statement**" has the meaning set forth in Section 2.1.1(a).

(n) "**Issuer Free Writing Prospectus**" means an issuer free writing prospectus, as defined in Rule 433 under the Securities Act, relating to an offer of the Registrable Securities.

(o) "**Laws**" mean all United States and foreign national, federal, state, and local laws, statutes, ordinances, rules, regulations, orders, treaties and decrees.

(p) "**Loss**" has the meaning set forth in Section 2.7.1.

(q) "**New Registration Statement**" has the meaning set forth in Section 2.1.1.

(r) "**Permitted Transferee**" means any Affiliate of the Purchaser.

(s) "**Person**" means any individual, firm, corporation, limited liability company, partnership, company or other entity, and shall include any successor (by merger or otherwise) of such entity.

(t) "**Pre-Funded Warrant**" means the pre-funded warrant to purchase Common Stock issued to the Purchaser pursuant to the Purchase Agreement.

(u) "**Prospectus**" means (i) the prospectus included in any Registration Statement, all amendments and supplements to such prospectus, including post-effective amendments and supplements, and all other material incorporated by reference in such prospectus, and (ii) any Issuer Free Writing Prospectus.

(v) "**Public Offering**" means the offer and sale of Registrable Securities for cash pursuant to an effective registration statement under the Securities Act (other than a registration statement on Form S-4 or Form S-8 or any successor form).

(w) "**Purchase Agreement**" means the Securities Purchase Agreement, by and between the Company and the Purchaser, dated as of November [25], 2024.

(x) "**Purchaser**" has the meaning set forth in the preamble.

(y) "**Registrable Securities**" means all of (i) the Shares, (ii) the Warrant Shares, and (iii) any securities issued or issuable upon any stock split, dividend or other distribution, recapitalization or similar event with respect to the foregoing, *provided*, that with respect to a particular Holder, such Holder's Shares and Warrant Shares shall cease to be Registrable Securities upon a sale pursuant to a Registration Statement or Rule 144 under the Securities Act (in which case, only such security sold by the Holder shall cease to be a Registrable Security).

(z) "**Registration**" means registration under the Securities Act of the offer and sale to the public of any Registrable Securities under a Registration Statement. The terms "**register**", "**registered**" and "**registering**" shall have correlative meanings.

(aa) "**Registration Expenses**" has the meaning set forth in Section 2.6.

(bb) "**Registration Statement**" or "**Registration Statements**" means any one or more registration statements of the Company filed under the Securities Act that covers the resale of any of the Registrable Securities pursuant to the provisions of this Agreement (including the Initial Registration Statement, the New Registration Statement and, if applicable, any Additional Registration Statement), amendments and supplements to such Registration Statements, including post-effective amendments, all exhibits and all material incorporated by reference or deemed to be incorporated by reference in such Registration Statements.

(cc) "**Representatives**" means, with respect to any Person, any of such Person's officers, directors, employees, agents, attorneys, accountants, actuaries, consultants, equity financing partners or financial advisors or other Person associated with, or acting on behalf of, such Person.

(dd) "**Rule 144**" means Rule 144 under the Securities Act (or any successor rule).

(ee) "**SEC**" means the Securities and Exchange Commission.

(ff) "**Securities Act**" means the Securities Act of 1933, as amended.

(gg) "**Selling Stockholder Information**" has the meaning set forth in Section 2.7.1.

(hh) "**Shares**" means the shares of Common Stock issued or issuable to the Purchaser pursuant to the Purchase Agreement.

(ii) "**Shelf Takedown Request**" has the meaning set forth in Section 2.1.4(a).

(jj) "**Suspension**" has the meaning set forth in Section 2.1.3.

(kk) "**Transfer**" means, with respect to any Registrable Security, any interest therein, or any other securities or equity interests relating thereto, a direct or indirect transfer, sale, exchange, assignment, pledge, hypothecation or other encumbrance or other disposition thereof, including the grant of an option or other right, whether directly or indirectly, whether voluntarily,

involuntarily, by operation of law, pursuant to judicial process or otherwise. "**Transferred**" shall have a correlative meaning.

(ll) "**Underwritten Public Offering**" means an underwritten Public Offering, including any bought deal or block sale to a financial institution conducted as an underwritten Public Offering.

(mm) "**Underwritten Shelf Takedown**" means an Underwritten Public Offering pursuant to the Initial Registration Statement or a New Registration Statement.

(nn) "**Warrant Shares**" means the shares of Common Stock issued or issuable upon exercise of a Pre-Funded Warrant.

Section 1.2. Construction. Whenever required by the context, any pronoun used in this Agreement shall include the corresponding masculine, feminine or neuter forms, and the singular forms of nouns, pronouns, and verbs shall include the plural and vice versa. Reference to any agreement, document, or instrument means such agreement, document, or instrument as amended or otherwise modified from time to time in accordance with the terms thereof and, if applicable, hereof. A reference to any party hereto includes such party's permitted assignees and/or the respective successors in title to substantially the whole of such party's undertaking. All references to "Sections" contained in this Agreement are, unless specifically indicated otherwise, references to sections, schedules, or exhibits of or to this Agreement. The recitals, schedules and exhibits to this Agreement form part of the operative provisions of this Agreement and references to this Agreement shall, unless the context otherwise requires, include references to the recitals to this Agreement. As used in this Agreement, the following terms shall have the meanings indicated: (a) "day" means a calendar day; (b) "U.S." or "United States" means the United States of America; (c) "dollar" or "$" means lawful currency of the United States; (d) "including" or "include" means "including without limitation"; and (e) references in this Agreement to specific laws includes the succeeding law, section, or provision corresponding thereto and the rules and regulations promulgated thereunder.

ARTICLE II

REGISTRATION RIGHTS

The Company will perform and comply, and cause each of its subsidiaries to perform and comply, with such of the following provisions as are applicable to it. Each Holder will perform and comply with such of the following provisions as are applicable to such Holder.

Section 2.1. Registration.

Section 2.1.1. Request for Registration.

(a) As promptly as possible, and in any event within thirty (30) calendar days of the Closing (the "**Filing Deadline**"), the Company shall file with the SEC a shelf Registration Statement pursuant to Rule 415 under the Securities Act or, if Rule 415 is not available for offers and sales of the Registrable Securities, by such other means of distribution of Registrable Securities as the Holders may reasonably specify (the "**Initial Registration Statement**"), relating

to the offer and sale of Registrable Securities by any Holders thereof from time to time in accordance with the methods of distribution elected by such Holders, and the Company shall use its reasonable best efforts to cause the Initial Registration Statement to promptly become effective under the Securities Act, *provided*, *however*, that the Company shall be permitted to file a post-effective amendment or Prospectus supplement to any effective shelf Registration Statement in lieu of filing a new Registration Statement to the extent the Company determines, and the Holders agree, that the Registrable Securities may be sold thereunder by the Holders pursuant to their intended plan of distribution.

(b) Notwithstanding the registration obligations set forth in this Section 2.1.1, in the event the SEC informs the Company that all of the Registrable Securities cannot, as a result of the application of Rule 415, be registered for resale as a secondary offering on a single registration statement, the Company agrees to promptly (i) inform each of the Holders thereof and use its commercially reasonable efforts to file amendments to the Initial Registration Statement as required by the SEC and/or (ii) withdraw the Initial Registration Statement and file a new registration statement (a "**New Registration Statement**"), in either case covering the maximum number of Registrable Securities permitted to be registered by the SEC, on Form S-3 or such other form available to register for resale the Registrable Securities as a secondary offering; *provided, however*, that prior to filing such amendment or New Registration Statement, the Company shall be obligated to use its commercially reasonable efforts to advocate with the SEC for the registration of all of the Registrable Securities. Notwithstanding any other provision of this Agreement, if the SEC limits the number of Registrable Securities permitted to be registered on a particular Registration Statement as a secondary offering (and notwithstanding that the Company used diligent efforts to advocate with the SEC for the registration of all or a greater number of Registrable Securities), unless otherwise directed in writing by a Holder as to its Registrable Securities, the number of Registrable Securities to be registered on such Registration Statement will be reduced: first by Registrable Securities not acquired pursuant to the Purchase Agreement (whether pursuant to registration rights or otherwise); second by Registrable Securities represented by the Pre-Funded Warrant; and third by Registrable Securities represented by Shares. In the event the Company amends the Initial Registration Statement or files a New Registration Statement, as the case may be, under clauses (i) or (ii) above, the Company will use its commercially reasonable efforts to file with the SEC, as promptly as allowed by SEC, one or more registration statements on Form S-3 or such other form available to register for resale those Registrable Securities that were not registered for resale on the Initial Registration Statement, as amended, or the New Registration Statement.

Section 2.1.2. Continued Effectiveness. The Company shall use its reasonable best efforts to keep such Registration Statement continuously effective under the Securities Act in order to permit the Prospectus forming part of the Registration Statement to be usable by Holders until the date as of which no Holder holds Registrable Securities (such period of effectiveness, the "**Effectiveness Period**"). Subject to Section 2.1.3, the Company shall be deemed not to have used its reasonable best efforts to keep the Registration Statement effective during the Effectiveness Period if the Company voluntarily takes any action or omits to take any action that would result in Holders of the Registrable Securities covered thereby not being able to offer and sell any Registrable Securities pursuant to such Registration Statement during the Effectiveness Period, unless such action or omission is required by applicable law.

Section 2.1.3. Suspension of Registration. If the continued use of such Registration Statement at any time would require the Company to make an Adverse Disclosure, the Company may, upon giving prompt written notice of such action to the Holders (provided that in no event shall such notice contain any material, nonpublic information), suspend use of the Registration Statement (a "**Suspension**"); *provided, however*, that the Company shall not be permitted to exercise a Suspension more than one time during any twelve (12)-month period for a period not to exceed sixty (60) days. In the case of a Suspension, the Holders agree to suspend use of the applicable Prospectus in connection with any sale or purchase of, or offer to sell or purchase, Registrable Securities, upon receipt of the notice referred to above. The Company shall immediately notify the Holders in writing upon the termination of any Suspension (provided that in no event shall such notice contain any material, nonpublic information), amend or supplement the Prospectus, if necessary, so it does not contain any untrue statement or omission and furnish to the Holders such numbers of copies of the Prospectus as so amended or supplemented as the Holders may reasonably request. The Company shall, if necessary, supplement or amend the Registration Statement, if required by the registration form used by the Company for the Registration Statement or by the instructions applicable to such registration form or by the Securities Act or the rules or regulations promulgated thereunder or as may reasonably be requested by the Holders of a majority of Registrable Securities that are included in such Registration Statement.

Section 2.1.4. Shelf Takedown. During the Effectiveness Period, by notice to the Company specifying the intended method or methods of disposition thereof, the Purchaser may make a written request (a "**Shelf Takedown Request**") to the Company to effect a Public Offering, including an Underwritten Shelf Takedown, of all or a portion of the Registrable Securities that may be registered under such Registration Statement, and as soon as practicable the Company shall amend or supplement the Registration Statement as necessary for such purpose.

Section 2.1.5. Statutory Underwriters. Notwithstanding anything to the contrary contained herein, in no event shall the Company be permitted to name any Holder or affiliate of a Holder as an underwriter without the prior written consent of such Holder. In no event shall any Holder be identified as a statutory underwriter in any Registration Statement; *provided, however*, that if the Commission requests that a Holder be identified as a statutory underwriter in the Registration Statement, such Holder will have an opportunity to withdraw from the Registration Statement.

Section 2.2. Registration Procedures.

Section 2.2.1. Requirements. In connection with the Company's obligations under Section 2.1, the Company shall use its reasonable best efforts to effect such Registration and to permit the sale of such Registrable Securities in accordance with the intended method or methods of distribution thereof as expeditiously as reasonably practicable, and in connection therewith the Company shall:

(a) Before filing a Registration Statement or Prospectus or any amendments or supplements thereto, (x) furnish to the underwriters, if any, and to the Holders of the Registrable Securities covered by such Registration Statement, copies of all documents prepared to be filed, which documents shall be subject to the review of such underwriters and such Holders and their

respective counsel and (y) make such changes in such documents concerning the Holders prior to the filing thereof as such Holders, or their counsel, may reasonably request;

(b) prepare and file with the SEC such amendments and post-effective amendments to such Registration Statement and supplements to the Prospectus as may be (x) reasonably requested by any Holder with Registrable Securities covered by such Registration Statement, (y) reasonably requested by any participating Holder (to the extent such request relates to information relating to such Holder), or (z) necessary to keep such Registration Statement effective during the Effectiveness Period, and comply with provisions of the applicable securities laws with respect to the sale or other disposition of all securities covered by such Registration Statement during such period in accordance with the intended method or methods of disposition by the sellers thereof set forth in such Registration Statement;

(c) notify the participating Holders and the managing underwriter or underwriters, if any, and (if requested) confirm such notice in writing and provide copies of the relevant documents, as soon as reasonably practicable after notice thereof is received by the Company (a) when the applicable Registration Statement or any amendment thereto has been filed or becomes effective, and when the applicable Prospectus or any amendment or supplement thereto has been filed, (b) of any written comments by the SEC, or any request by the SEC or other federal or state governmental authority for amendments or supplements to such Registration Statement or such Prospectus, or for additional information (whether before or after the effective date of the Registration Statement) or any other correspondence with the SEC relating to, or which may affect, the Registration, (c) of the issuance by the SEC of any stop order suspending the effectiveness of such Registration Statement or any order by the SEC or any other regulatory authority preventing or suspending the use of any preliminary or final Prospectus or the initiation or threatening of any proceedings for such purposes, (d) if, at any time, the representations and warranties of the Company in any applicable underwriting agreement cease to be true and correct in all material respects and (e) of the receipt by the Company of any notification with respect to the suspension of the qualification of the Registrable Securities for offering or sale in any jurisdiction or the initiation or threatening of any proceeding for such purpose;

(d) promptly notify each selling Holder and the managing underwriter or underwriters, if any, when the Company becomes aware of the happening of any event as a result of which the applicable Registration Statement or the Prospectus included in such Registration Statement contains any untrue statement of a material fact or omits to state a material fact necessary to make the statements therein (in the case of such Prospectus or any preliminary Prospectus, in light of the circumstances under which they were made) not misleading, when any Issuer Free Writing Prospectus includes information that may conflict with the information contained in the Registration Statement, or, if for any other reason it shall be necessary during such time period to amend or supplement such Registration Statement or Prospectus in order to comply with the Securities Act and, as promptly as reasonably practicable thereafter, prepare and file with the SEC, and furnish without charge to the selling Holders and the managing underwriter or underwriters, if any, an amendment or supplement to such Registration Statement or Prospectus, which shall correct such misstatement or omission or effect such compliance;

(e) to the extent the Company is eligible under the relevant provisions of Rule 430B under the Securities Act, the Company shall include in the applicable Registration Statement

such disclosures as may be required by Rule 430B under the Securities Act (referring to the unnamed selling security holders in a generic manner by identifying the initial offering of the securities to the Holders) in order to ensure that the Holders may be added to such Registration Statement at a later time through the filing of a Prospectus supplement rather than a post-effective amendment;

(f) use its reasonable best efforts to prevent, or obtain the withdrawal of, any stop order or other order or notice preventing or suspending the use of any preliminary or final Prospectus;

(g) promptly incorporate in a Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment such information as the managing underwriter or underwriters and the Purchaser agree should be included therein relating to the plan of distribution with respect to such Registrable Securities; and make all required filings of such Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment as soon as reasonably practicable after being notified of the matters to be incorporated in such Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment;

(h) furnish to each selling Holder and each underwriter, if any, without charge, as many conformed copies as such Holder or underwriter may reasonably request of the applicable Registration Statement and any amendment or post-effective amendment or supplement thereto, including financial statements and schedules, all documents incorporated therein by reference and all exhibits (including those incorporated by reference);

(i) deliver to each selling Holder and each underwriter, if any, without charge, as many copies of the applicable Prospectus (including each preliminary Prospectus) and any amendment or supplement thereto and such other documents as such Holder or underwriter may reasonably request in order to facilitate the disposition of the Registrable Securities by such Holder or underwriter (it being understood that the Company shall consent to the use of such Prospectus or any amendment or supplement thereto by each of the selling Holders and the underwriters, if any, in connection with the offering and sale of the Registrable Securities covered by such Prospectus or any amendment or supplement thereto);

(j) on or prior to the date on which the applicable Registration Statement becomes effective, use its reasonable best efforts to register or qualify in connection with the Registration or qualification of such Registrable Securities for offer and sale under the securities or "Blue Sky" laws of each state and other jurisdiction as any such selling Holder or managing underwriter or underwriters, if any, or their respective counsel reasonably request in writing and do any and all other acts or things reasonably necessary or advisable to keep such Registration or qualification in effect for the Effectiveness Period, *provided* that the Company shall not be required to qualify generally to do business in any jurisdiction where it is not then so qualified or to take any action which would subject it to taxation or general service of process in any such jurisdiction where it is not then so subject;

(k) cooperate with the selling Holders and the managing underwriter or underwriters, if any, to facilitate the timely preparation and delivery of certificates representing Registrable Securities to be sold and not bearing any restrictive legends and enable such

Registrable Securities to be in such denominations and registered in such names as the managing underwriters may request prior to any sale of Registrable Securities to the underwriters;

(l) use its reasonable best efforts to cause the Registrable Securities covered by the applicable Registration Statement to be registered with or approved by such other governmental agencies or authorities as may be necessary to enable the seller or sellers thereof or the underwriter or underwriters, if any, to consummate the disposition of such Registrable Securities;

(m) make such representations and warranties to the Holders being registered, and the underwriters or agents, if any, in form, substance and scope as are customarily made by issuers in public offerings similar to the offering then being undertaken;

(n) enter into such customary agreements (including underwriting and indemnification agreements) and take all such other actions as the Purchaser or the managing underwriter or underwriters, if any, reasonably request in order to expedite or facilitate the Registration and disposition of such Registrable Securities;

(o) obtain for delivery to the Holders and to the underwriter or underwriters, if any, an opinion or opinions from counsel for the Company dated the most recent effective date of the Registration Statement or, in the event of an Underwritten Public Offering, the date of the closing under the underwriting agreement, in customary form, scope and substance, which opinions shall be reasonably satisfactory to such Holders or underwriters, as the case may be, and their respective counsel;

(p) in the case of an Underwritten Public Offering, obtain for delivery to the Company and the managing underwriter or underwriters, with copies to the Holders included in such Registration or sale, a comfort letter from the Company's independent certified public accountants or independent auditors (and, if necessary, any other independent certified public accountants or independent auditors of any subsidiary of the Company or any business acquired by the Company for which financial statements and financial data are, or are required to be, included in the Registration Statement) in customary form and covering such matters of the type customarily covered by comfort letters as the managing underwriter or underwriters reasonably request, dated the date of execution of the underwriting agreement and brought down to the closing under the underwriting agreement;

(q) cooperate with each seller of Registrable Securities and each underwriter, if any, participating in the disposition of such Registrable Securities and their respective counsel in connection with any filings required to be made with FINRA;

(r) provide and cause to be maintained a transfer agent and registrar for all Registrable Securities covered by the applicable Registration Statement;

(s) use its reasonable best efforts to cause all Registrable Securities covered by the applicable Registration Statement to be listed on each securities exchange on which any of the Company's equity securities are then listed or quoted and on each inter-dealer quotation system on which any of the Company's equity securities are then quoted;

(t) make available upon reasonable notice at reasonable times and for reasonable periods for inspection by the Purchaser, by any underwriter participating in any disposition to be effected pursuant to such Registration Statement and by any attorney, accountant or other agent retained by the Purchaser or any such underwriter, all pertinent financial and other records and pertinent corporate documents and properties of the Company, and cause all of the Company's officers, directors and employees and the independent public accountants who have certified its financial statements to make themselves available to discuss the business of the Company and to supply all information reasonably requested by any such Person in connection with such Registration Statement;

(u) in the case of an Underwritten Public Offering, cause the senior executive officers of the Company to participate in the customary "road show" presentations that may be reasonably requested by the managing underwriter or underwriters in any such offering and otherwise to facilitate, cooperate with, and participate in each proposed offering contemplated herein and customary selling efforts related thereto;

(v) take no direct or indirect action prohibited by Regulation M under the Exchange Act;

(w) take all reasonable action to ensure that any Issuer Free Writing Prospectus utilized in connection with any Registration complies in all material respects with the Securities Act, is filed in accordance with the Securities Act to the extent required thereby, is retained in accordance with the Securities Act to the extent required thereby and, when taken together with the related Prospectus, will not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements therein, in light of the circumstances under which they were made, not misleading; and

(x) take all such other commercially reasonable actions as are necessary or advisable in order to expedite or facilitate the disposition of such Registrable Securities in accordance with the terms of this Agreement.

Section 2.2.2. Company Information Requests. The Company may require each seller of Registrable Securities as to which any Registration or sale is being effected to furnish to the Company such information regarding the distribution of such securities and such other information relating to such Holder and its ownership of Registrable Securities as the Company may from time to time reasonably request in writing. Each Holder agrees to furnish such information to the Company and to cooperate with the Company as reasonably necessary to enable the Company to comply with the provisions of this Agreement.

Section 2.2.3. Discontinuing Registration. Each Holder agrees that, upon receipt of any notice from the Company of the happening of any event of the kind described in Section 2.2.1(d), such Holder will discontinue disposition of Registrable Securities pursuant to such Registration Statement until such Holder's receipt of the copies of the supplemented or amended Prospectus contemplated by Section 2.2.1(d), or until such Holder is advised in writing by the Company that the use of the Prospectus may be resumed, and has received copies of any additional or supplemental filings that are incorporated by reference in the Prospectus, or any amendments or supplements thereto, and if so directed by the Company, such Holder shall deliver to the

Company (at the Company's expense) all copies, other than permanent file copies then in such Holder's possession, of the Prospectus covering such Registrable Securities current at the time of receipt of such notice.

Section 2.3. Underwritten Offerings.

Section 2.3.1. Shelf Registrations. If requested by the underwriters for any Underwritten Shelf Takedown, pursuant to a Registration or sale under Section 2.1, the Company shall enter into an underwriting agreement with such underwriters, such agreement to be reasonably satisfactory in substance and form to each of the Company, the Purchaser and the underwriters, and to contain such representations and warranties by the Company and such other terms as are generally prevailing in agreements of that type, including indemnities no less favorable to the recipient thereof than those provided in Section 2.6 of this Agreement. The Holders of the Registrable Securities proposed to be distributed by such underwriters shall cooperate with the Company in the negotiation of the underwriting agreement and shall give consideration to the reasonable suggestions of the Company regarding the form thereof, and such Holders shall complete and execute all questionnaires, powers of attorney and other documents reasonably requested by the underwriters and required under the terms of such underwriting arrangements. Any such Holder shall not be required to make any representations or warranties to or agreements with the Company or the underwriters other than representations, warranties or agreements regarding such Holder, such Holder's title to the Registrable Securities, such Holder's intended method of distribution and any other representations to be made by the Holder as are generally prevailing in agreements of that type, and the aggregate amount of the liability of such Holder under such agreement shall not exceed such Holder's proceeds from the sale of its Registrable Securities in the offering, net of underwriting discounts and commissions but before expenses.

Section 2.3.2. Selection of Underwriters; Selection of Counsel. In the case of an Underwritten Shelf Takedown under Section 2.1, the managing underwriter or underwriters to administer the offering shall be determined by the Purchaser and counsel to the Holders shall be mutually agreed upon by the Company and the Purchaser.

Section 2.4. No Inconsistent Agreements; Additional Rights. Neither the Company nor any of its subsidiaries shall hereafter enter into, and neither the Company nor any of its subsidiaries is currently a party to, any agreement with respect to its securities that is inconsistent with the rights granted to the Holders by this Agreement. The Company hereby represents and warrants that, as of the date hereof, no registration or similar rights have been granted to any other Person other than pursuant to this Agreement.

Section 2.5. Registration Expenses. All expenses incident to the Company's performance of or compliance with this Agreement shall be paid by the Company, including (i) all registration and filing fees, and any other fees and expenses associated with filings required to be made with the SEC or FINRA, (ii) all fees and expenses in connection with compliance with any securities or "Blue Sky" laws (including reasonable fees and disbursements of counsel for the underwriters in connection with blue sky qualifications of the Registrable Securities), (iii) all printing, duplicating, word processing, messenger, telephone, facsimile and delivery expenses (including expenses of printing certificates for the Registrable Securities in a form eligible for

deposit with The Depository Trust Company and of printing Prospectuses), (iv) all fees and disbursements of counsel for the Company and of all independent certified public accountants or independent auditors of the Company and any subsidiaries of the Company (including the expenses of any special audit and comfort letters required by or incident to such performance), (v) Securities Act liability insurance or similar insurance if the Company so desires or the underwriters so require in accordance with then-customary underwriting practice, (vi) all fees and expenses incurred in connection with the listing of the Registrable Securities on any securities exchange or quotation of the Registrable Securities on any inter-dealer quotation system, (viii) all reasonable fees and disbursements of one legal counsel for the selling Holders, (ix) any reasonable fees and disbursements of underwriters customarily paid by issuers or sellers of securities, (x) all fees and expenses incurred in connection with the distribution or Transfer of Registrable Securities to or by a Holder or its Permitted Transferees in connection with a Public Offering, (xi) all fees and expenses of any special experts or other Persons retained by the Company in connection with any Registration or sale, (xii) all of the Company's internal expenses (including all salaries and expenses of its officers and employees performing legal or accounting duties) and (xiii) all expenses related to the "road show" for any Underwritten Public Offering, including the reasonable out-of-pocket expenses of the Holders and underwriters, if so requested. All such expenses are referred to herein as "**Registration Expenses**". The Company shall not be required to pay any fees and disbursements to underwriters not customarily paid by the issuers of securities in an offering similar to the applicable offering, including underwriting discounts and commissions and transfer taxes, if any, attributable to the sale of Registrable Securities.

Section 2.6. Indemnification.

Section 2.6.1. Indemnification by the Company. The Company shall indemnify and hold harmless, to the full extent permitted by law, each Holder, each shareholder, member, limited or general partner of such Holder, each shareholder, member, limited or general partner of each such shareholder, member, limited or general partner, each of their respective Affiliates, officers, directors, shareholders, employees, advisors, and agents and each Person who controls (within the meaning of the Securities Act or the Exchange Act) such Persons and each of their respective Representatives from and against any and all losses, penalties, judgments, suits, costs, claims, damages, liabilities and expenses, joint or several (including reasonable costs of investigation and legal expenses and any indemnity and contribution payments made to underwriters) (each, a "**Loss**" and collectively "**Losses**") arising out of or based upon (i) any untrue or alleged untrue statement of a material fact contained in any Registration Statement under which such Registrable Securities are registered or sold under the Securities Act (including any final, preliminary or summary Prospectus contained therein or any amendment thereof or supplement thereto or any documents incorporated by reference therein) or any other disclosure document produced by or on behalf of the Company or any of its subsidiaries including any report and other document filed under the Exchange Act, (ii) any omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein (in the case of a Prospectus or preliminary Prospectus, in light of the circumstances under which they were made) not misleading or (iii) any violation or alleged violation by the Company or any of its subsidiaries of any federal, state, foreign or common law rule or regulation applicable to the Company or any of its subsidiaries and relating to action or inaction in connection with any such registration, disclosure document or other document or report; *provided*, that no selling Holder shall be entitled to indemnification pursuant to this Section 2.6.1 in respect of any untrue statement

or omission contained in any information relating to such seller Holder furnished in writing by such selling Holder to the Company specifically for inclusion in a Registration Statement and used by the Company in conformity therewith (such information "**Selling Stockholder Information**"). This indemnity shall be in addition to any liability the Company may otherwise have. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of such Holder or any indemnified party and shall survive the Transfer of such securities by such Holder and regardless of any indemnity agreed to in the underwriting agreement that is less favorable to the Holders. The Company shall also indemnify underwriters, selling brokers, dealer managers and similar securities industry professionals participating in the distribution, their officers and directors and each Person who controls such Persons (within the meaning of the Securities Act and the Exchange Act) to the same extent as provided above (with appropriate modification) with respect to the indemnification of the indemnified parties.

Section 2.6.2. Indemnification by the Selling Holders. Each selling Holder agrees (severally and not jointly) to indemnify and hold harmless, to the fullest extent permitted by law, the Company, its directors and officers and each Person who controls the Company (within the meaning of the Securities Act or the Exchange Act) from and against any Losses resulting from (i) any untrue statement of a material fact in any Registration Statement under which such Registrable Securities were registered or sold under the Securities Act (including any final, preliminary or summary Prospectus contained therein or any amendment thereof or supplement thereto or any documents incorporated by reference therein) or (ii) any omission to state therein a material fact required to be stated therein or necessary to make the statements therein (in the case of a Prospectus or preliminary Prospectus, in light of the circumstances under which they were made) not misleading, in each case to the extent, but only to the extent, that such untrue statement or omission is contained in such selling Holder's Selling Stockholder Information. In no event shall the liability of any selling Holder hereunder be greater in amount than the dollar amount of the proceeds from the sale of its Registrable Securities in the offering giving rise to such indemnification obligation, net of underwriting discounts and commissions but before expenses, less any amounts paid by such Holder pursuant to Section 2.6.4 and any amounts paid by such Holder as a result of liabilities incurred under the underwriting agreement, if any, related to such sale.

Section 2.6.3. Conduct of Indemnification Proceedings. Any Person entitled to indemnification hereunder shall (i) give prompt written notice to the indemnifying party of any claim with respect to which it seeks indemnification (provided that any delay or failure to so notify the indemnifying party shall relieve the indemnifying party of its obligations hereunder only to the extent, if at all, that it forfeits substantive legal rights by reason of such delay or failure) and (ii) permit such indemnifying party to assume the defense of such claim with counsel reasonably satisfactory to the indemnified party; *provided, however*, that any Person entitled to indemnification hereunder shall have the right to select and employ separate counsel and to participate in the defense of such claim, but the fees and expenses of such counsel shall be at the expense of such Person unless (i) the indemnifying party has agreed in writing to pay such fees or expenses, (ii) the indemnifying party shall have failed to assume the defense of such claim within a reasonable time after receipt of notice of such claim from the Person entitled to indemnification hereunder and employ counsel reasonably satisfactory to such Person, (iii) the indemnified party has reasonably concluded (based upon advice of its counsel) that there may be legal defenses available to it or other indemnified parties that are different from or in addition to those available

to the indemnifying party, or (iv) in the reasonable judgment of any such Person (based upon advice of its counsel) a conflict of interest may exist between such Person and the indemnifying party with respect to such claims (in which case, if the Person notifies the indemnifying party in writing that such Person elects to employ separate counsel at the expense of the indemnifying party, the indemnifying party shall not have the right to assume the defense of such claim on behalf of such Person). If the indemnifying party assumes the defense, the indemnifying party shall not have the right to settle such action without the consent of the indemnified party. No indemnifying party shall consent to entry of any judgment or enter into any settlement which does not include as an unconditional term thereof the giving by the claimant or plaintiff to such indemnified party of an unconditional release from all liability in respect to such claim or litigation without the prior written consent of such indemnified party. If such defense is not assumed by the indemnifying party, the indemnifying party will not be subject to any liability for any settlement made without its prior written consent, but such consent may not be unreasonably withheld. It is understood that the indemnifying party or parties shall not, except as specifically set forth in this Section 2.6.3, in connection with any proceeding or related proceedings in the same jurisdiction, be liable for the reasonable fees, disbursements or other charges of more than one separate firm admitted to practice in such jurisdiction at any one time unless (x) the employment of more than one counsel has been authorized in writing by the indemnifying party or parties, (y) an indemnified party has reasonably concluded (based on the advice of counsel) that there may be legal defenses available to it that are different from or in addition to those available to the other indemnified parties or (z) a conflict or potential conflict exists or may exist (based upon advice of counsel to an indemnified party) between such indemnified party and the other indemnified parties, in each of which cases the indemnifying party shall be obligated to pay the reasonable fees and expenses of such additional counsel or counsels.

Section 2.6.4. Contribution. If for any reason the indemnification provided for in Section 2.6.1 and Section 2.6.2 is unavailable to an indemnified party or insufficient in respect of any Losses referred to therein (other than as a result of exceptions or limitations on indemnification contained in Section 2.6.1 and Section 2.6.2), then the indemnifying party shall contribute to the amount paid or payable by the indemnified party as a result of such Loss in such proportion as is appropriate to reflect the relative fault of the indemnifying party on the one hand and the indemnified party or parties on the other hand in connection with the acts, statements or omissions that resulted in such Losses, as well as any other relevant equitable considerations. In connection with any Registration Statement filed with the SEC by the Company, the relative fault of the indemnifying party on the one hand and the indemnified party on the other hand shall be determined by reference to, among other things, whether any untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the indemnifying party or by the indemnified party and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such statement or omission. The parties hereto agree that it would not be just or equitable if contribution pursuant to this Section 2.6.4 were determined by pro rata allocation or by any other method of allocation that does not take account of the equitable considerations referred to in this Section 2.6.4. No Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation. The amount paid or payable by an indemnified party as a result of the Losses referred to in Sections 2.6.1 and 2.6.2 shall be deemed to include, subject to the limitations set forth above, any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or

defending any such action or claim. Notwithstanding the provisions of this Section 2.6.4, in connection with any Registration Statement filed by the Company, a selling Holder shall not be required to contribute any amount in excess of the dollar amount of the proceeds from the sale of its Registrable Securities in the offering giving rise to such indemnification obligation, net of underwriting discounts and commissions but before expenses, less any amounts paid by such Holder pursuant to Section 2.6.2 and any amounts paid by such Holder as a result of liabilities incurred under the underwriting agreement, if any, related to such sale. If indemnification is available under this Section 2.6, the indemnifying parties shall indemnify each indemnified party to the full extent provided in Sections 2.6.1 and 2.6.2 hereof without regard to the provisions of this Section 2.6.4. The remedies provided for in this Section 2.6 are not exclusive and shall not limit any rights or remedies which may otherwise be available to any indemnified party at law or in equity.

Section 2.7. Indemnification Priority. The Company hereby acknowledges and agrees that any of the Persons entitled to indemnification pursuant to Section 2.6.1 (each, a "**Company Indemnitee**" and collectively, the "**Company Indemnitees**") may have certain rights to indemnification, advancement of expenses and/or insurance provided by other sources. The Company hereby acknowledges and agrees (i) that it is the indemnitor of first resort (i.e., its obligations to a Company Indemnitee are primary and any obligation of such other sources to advance expenses or to provide indemnification for the same expenses or liabilities incurred by such Company Indemnitee are secondary) and (ii) that it shall be required to advance the full amount of expenses incurred by a Company Indemnitee and shall be liable for the full amount of all expenses, judgments, penalties, fines and amounts paid in settlement to the extent legally permitted and as required by the terms of this Agreement without regard to any rights a Company Indemnitee may have against such other sources. The Company further agrees that no advancement or payment by such other sources on behalf of a Company Indemnitee with respect to any claim for which such Company Indemnitee has sought indemnification, advancement of expenses or insurance from the Company shall affect the foregoing, and that such other sources shall have a right of contribution and/or be subrogated to the extent of such advancement or payment to all of the rights of recovery of such Company Indemnitee against the Company.

Section 2.8. Rules 144 and 144A and Regulation S. The Company shall file the reports required to be filed by it under the Securities Act and the Exchange Act and the rules and regulations adopted by the SEC thereunder (or, if the Company is not required to file such reports, it will, upon the request of any Holder, make publicly available such necessary information for so long as necessary to permit sales that would otherwise be permitted by this Agreement pursuant to Rule 144, Rule 144A or Regulation S under the Securities Act, as such rules may be amended from time to time or any similar rule or regulation hereafter adopted by the SEC), and it will take such further action as any Holder may reasonably request, all to the extent required from time to time to enable such Holder to sell Registrable Securities without Registration under the Securities Act in transactions that would otherwise be permitted by this Agreement and within the limitation of the exemptions provided by (i) Rule 144, Rule 144A or Regulation S under the Securities Act, as such rules may be amended from time to time, or (ii) any similar rule or regulation hereafter adopted by the SEC. Upon the request of any Holder, the Company will deliver to such Holder a written statement as to whether it has complied with such requirements and, if not, the specifics thereof.

Section 2.9. Existing Registration Statements. Notwithstanding anything herein to the contrary and subject to applicable law and regulation, the Company may satisfy any obligation hereunder to file a Registration Statement or to have a Registration Statement become effective by a specified date by designating, by notice to the Holders, a Registration Statement that previously has been filed with the SEC or become effective, as the case may be, as the relevant Registration Statement for purposes of satisfying such obligation, and all references to any such obligation shall be construed accordingly; *provided,* that such previously filed Registration Statement may be, and is, amended or, subject to applicable securities laws, supplemented to add the number of Registrable Securities, and, to the extent necessary, to identify as selling stockholders those Holders demanding the filing of a Registration Statement pursuant to the terms of this Agreement. To the extent this Agreement refers to the filing or effectiveness of other Registration Statements, by or at a specified time and the Company has, in lieu of then filing such Registration Statements or having such Registration Statements become effective, designated a previously filed or effective Registration Statement as the relevant Registration Statement for such purposes, in accordance with the preceding sentence, such references shall be construed to refer to such designated Registration Statement, as amended or supplemented in the manner contemplated by the immediately preceding sentence.

ARTICLE III

MISCELLANEOUS

Section 3.1. Termination and Effect of Termination. This Agreement shall terminate upon the date on which no Holder holds any Registrable Securities, except for the provisions of Sections 2.6 and 2.7, which shall survive any such termination. No termination under this Agreement shall relieve any Person of liability for breach or Registration Expenses incurred prior to termination. In the event this Agreement is terminated, each Person entitled to indemnification rights pursuant to Section 2.6 hereof shall retain such indemnification rights with respect to any matter that (i) may be an indemnified liability thereunder and (ii) occurred prior to such termination.

Section 3.2. Permitted Transferees; Assignment. The rights of a Holder hereunder may be assigned (but only with all related obligations as set forth below) in connection with a Transfer of Registrable Securities to a Permitted Transferee of that Holder. Without prejudice to any other or similar conditions imposed hereunder with respect to any such Transfer, no assignment permitted under the terms of this Section 3.2 will be effective unless the Permitted Transferee to which the assignment is being made, if not a Holder, has delivered to the Company a written acknowledgment and agreement in form and substance reasonably satisfactory to the Company that the Permitted Transferee will be bound by, and will be a party to, this Agreement. A Permitted Transferee to whom rights are transferred pursuant to this Section 3.2 may not again transfer those rights to any other Permitted Transferee, other than as provided in this Section 3.2. The Company may not assign its rights (except by merger or in connection with another entity acquiring all or substantially all of the Company's assets) or obligations hereunder without the prior written consent of all the Holders of the then outstanding Registrable Securities.

Section 3.3. Governing Law. This Agreement and all claims or causes of action (whether in tort, contract or otherwise) that may be based upon, arise out of or relate to this

Agreement or the negotiation, execution or performance of this Agreement (including any claim or cause of action based upon, arising out of or related to any representation or warranty made in or in connection with this Agreement) shall be governed by and construed in accordance with the Laws of the State of New York, without giving effect to any choice or conflict of law provision or rule (whether of the State of New York or any other jurisdiction) that would cause the application of the Laws of any jurisdiction other than the State of York.

Section 3.4. Counterparts. This Agreement may be executed in two (2) or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Counterparts may be delivered via facsimile, electronic mail or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

Section 3.5. Titles and Subtitles. The titles and subtitles used in this Agreement are used for convenience only and are not to be considered in construing or interpreting this Agreement.

Section 3.6. Notices. All notices and other communications given or made pursuant to this Agreement shall be in writing and shall be deemed effectively given upon the earlier of actual receipt, or (a) personal delivery to the party to be notified, (b) when sent, if sent by electronic mail during normal business hours of the recipient, and if not sent during normal business hours, then on the recipient's next Business Day, (c) five (5) days after having been sent by registered or certified mail, return receipt requested, postage prepaid, or (d) one (1) Business Day after deposit with a nationally recognized overnight courier, freight prepaid, specifying next Business Day delivery, with written verification of receipt. All communications shall be sent to the respective parties at their address as set forth on the signature page, or to such e-mail address or address as subsequently modified by written notice given in accordance with this Section 3.6.

Section 3.7. Waiver. Waiver by the Company or the Purchaser of a breach hereunder by the Purchaser or the Company, respectively, shall not be construed as a waiver of any subsequent breach of the same or any other provision. No delay or omission by a party in exercising or availing itself of any right, power or privilege hereunder shall preclude the later exercise of any such right, power or privilege by such party. No waiver shall be effective unless made in writing with specific reference to the relevant provision(s) of this Agreement and signed by a duly authorized representative of the party granting the waiver. All remedies, either under this Agreement or by law or otherwise afforded to any party, shall be cumulative and not alternative.

Section 3.8. Amendments. Any term of this Agreement may be amended or terminated only with the written consent of the Company and the Purchaser.

Section 3.9. Severability. The invalidity or unenforceability of any provision hereof shall in no way affect the validity or enforceability of any other provision.

Section 3.10. Entire Agreement. This Agreement and the Purchase Agreement constitute the full and entire understanding and agreement between the parties with respect to the subject matter hereof and thereof, and any other written or oral agreement relating to the subject matter hereof or thereof existing among the parties are expressly canceled.

Section 3.11. Specific Enforcement. The parties hereto agree that irreparable damage

would occur in the event that any of the provisions of this Agreement were not performed in accordance with their specific intent or were otherwise breached. It is accordingly agreed that the parties shall be entitled to an injunction or injunctions to prevent or cure breaches of the provisions of this Agreement and to enforce specifically the terms and provisions hereof, in addition to any other remedy to which they may be entitled by law or equity.

Section 3.12. Exclusive Jurisdiction; Venue. Each of the parties hereto irrevocably agrees that any legal action or proceeding with respect to this Agreement and the rights and obligations arising hereunder, or for recognition and enforcement of any judgment in respect of this Agreement and the rights and obligations arising hereunder brought by another party hereto or its successors or assigns, shall be brought and determined exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan and agrees that it will not bring any action relating to this Agreement or any of the transactions contemplated by this Agreement in any court other than the aforesaid courts. Each of the parties hereto hereby irrevocably waives, and agrees not to assert as a defense, counterclaim or otherwise, in any action or proceeding with respect to this Agreement, (a) any claim that it is not personally subject to the jurisdiction of the above named courts for any reason other than the failure to serve in accordance with this Section 3.12, (b) any claim that it or its property is exempt or immune from the jurisdiction of any such court or from any legal process commenced in such courts (whether through service of notice, attachment prior to judgment, attachment in aid of execution of judgment, execution of judgment or otherwise) and (c) to the fullest extent permitted by the applicable Law, any claim that (i) the suit, action or proceeding in such court is brought in an inconvenient forum, (ii) the venue of such suit, action or proceeding is improper or (iii) this Agreement, or the subject matter hereof, may not be enforced in or by such courts. Each of the parties hereto agrees that service of process upon such party in any such action or proceeding shall be effective if such process is given as a notice in accordance with Section 3.6.

Section 3.13. Waiver of Jury Trial. EACH OF THE PARTIES TO THIS AGREEMENT HEREBY IRREVOCABLY WAIVES TO THE EXTENT PERMITTED BY APPLICABLE LAW ANY AND ALL RIGHT TO A TRIAL BY JURY IN ANY DIRECT OR INDIRECT ACTION, PROCEEDING OR COUNTERCLAIM ARISING OUT OF OR RELATING TO THIS AGREEMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY. EACH PARTY (A) CERTIFIES THAT NO REPRESENTATIVE, AGENT OR ATTORNEY OF ANY OTHER PARTY HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PARTY WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE THE FOREGOING WAIVER, (B) MAKES THIS WAIVER VOLUNTARILY, AND (C) ACKNOWLEDGES THAT EACH PARTY HAS BEEN INDUCED TO ENTER INTO THIS AGREEMENT BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS CONTAINED IN THIS SECTION 3.13.

Section 3.14. Independent Nature of Holders' Obligations and Rights. The obligations of each Holder hereunder are several and not joint with the obligations of any other Holder hereunder, and no Holder shall be responsible in any way for the performance of the obligations of any other Holder hereunder. Nothing contained herein or in any other agreement or document delivered at any closing, and no action taken by any Holder pursuant hereto or thereto, shall be deemed to constitute the Holders as a partnership, an association, a joint venture or any other kind of group

or entity, or create a presumption that the Holders are in any way acting in concert or as a group or entity with respect to such obligations or the transactions contemplated by this Agreement or any other matters, and the Company acknowledges that the Holders are not acting in concert or as a group, and the Company shall not assert any such claim, with respect to such obligations or transactions. Each Holder shall be entitled to protect and enforce its rights, including the rights arising out of this Agreement, and it shall not be necessary for any other Holder to be joined as an additional party in any proceeding for such purpose. The use of a single agreement with respect to the obligations of the Company contained herein was solely in the control of the Company, not the action or decision of any Holder, and was done solely for the convenience of the Company and not because it was required or requested to do so by any Holder. It is expressly understood and agreed that each provision contained in this Agreement is between the Company and a Holder, solely, and not between the Company and the Holders collectively and not between and among Holders.

[Signature pages follow]

IN WITNESS WHEREOF, each of the undersigned has duly executed this Agreement as of the date first above written.

Company: ARROWHEAD PHARMACEUTICALS, INC.

By: _____
Name:
Title:

Purchaser: AVORO LIFE SCIENCES FUND LLC

By: _____
Name: Scott Epstein
Title: Partner, Chief Operating Officer &
Chief Compliance Officer

Arrowhead Pharmaceuticals, Inc.
Policy on Insider Trading
(Revised – Updated November 2024)

1. Purpose

This Insider Trading Policy provides the standards of Arrowhead Pharmaceuticals, Inc. and its affiliates ("Arrowhead") on trading and causing the trading of Arrowhead securities, or securities of certain other publicly traded companies, while in possession of material, non-public information.

2. Scope

This Policy applies to all transactions of Arrowhead securities, whether or not issued by Arrowhead, including common stock, options, preferred stock, notes, bonds, and convertible securities, as well as derivative securities relating to any of Arrowhead's securities.

This Policy applies to the following audiences, referred to as "Insiders":

- Arrowhead directors, officers, and employees, as well as contractors or consultants who have access to material, non-public information (together, "Arrowhead Personnel"), including any Family Members (defined below) of Arrowhead Personnel.

- Corporations, trusts, or other entities controlled, influenced or managed by Arrowhead Personnel or their family members (collectively referred to as "Controlled Entities").

Please note: Certain restrictions in this Policy apply only to "Covered Persons." Covered Persons means any director, officer, or employee of Arrowhead who has been notified by Arrowhead that they are a "Covered Person" under this Policy.

3. Definitions

(a) Family Members. Any individual who resides with or otherwise lives in the same household as Arrowhead Personnel, and any family members who do not live in the household but whose transactions in Arrowhead securities are or may be directed by Arrowhead Personnel or are subject to the influence or control of Arrowhead Personnel, such as parents or children who consult with Arrowhead Personnel before trading in Arrowhead securities.

(b) Materiality. Insider trading restrictions apply when the information an Insider possesses is "material." Information is "material" if there is a likelihood a reasonable investor would consider such information important in making an investment decision to trade securities. Both positive or negative information may be material.

Information involving the following subjects is likely to be material in many situations:

i. information regarding the progress, timeframes or results of Arrowhead's significant preclinical and clinical programs;

ii. proposals, plans, or agreements, involving mergers, acquisitions, strategic

alliances, collaborations, partnerships or licensing arrangements, or the purchase or sale of any significant asset;

iii. major changes in management or the board of directors;

iv. significant changes in Arrowhead ownership or control; and

v. developments regarding significant litigation or government investigations

There may be situations involving information, other than those above, which could be considered material. An Insider who is unsure whether information is material should consult with the General Counsel, or designee, before making any decision to disclose such information (other than to persons who need to know it for purposes of performing their Arrowhead job duties) or trade or recommend securities to which that information relates.

Non-public Information. Insiders are prohibited from trading when they possess information **that is material and "non-public." To be "public," information must** be widely disseminated in a manner generally used to reach investors (e.g., by means of a press release or a widely distributed statement from a senior officer or a filing with the U.S. Securities and Exchange **Commission (the "SEC"), and the investors must be given the opportunity to absorb the** information.

As with questions of materiality, an Insider who is not sure whether information is considered public should either consult with the General Counsel, or designee, or assume that the information is **"non-public" and treat it as** confidential.

(c) Trading and Transactions. For purposes of this Policy, references to "trading" and "transactions" of Arrowhead's securities include, among other things:

(i) purchases and sales of Arrowhead's securities in public markets or private transactions;

(ii) sales of Arrowhead's securities obtained through the exercise of employee stock options granted by Arrowhead, including broker-assisted cashless exercise (i.e., the broker selling some or all of the shares underlying the option on the open market);

(iii) making gifts of Arrowhead's securities (including charitable donations); or

(iv) using Arrowhead's securities to secure a loan.

Conversely, references to "trading" and "transactions" do not include:

(i) the exercise of Arrowhead stock options if no shares are to be sold;

(ii) the vesting of Arrowhead stock options, restricted stock or restricted stock units (RSUs);

(iii) transferring shares to an entity, which does not involve a change in the beneficial ownership of the shares (for example, transferring shares from one brokerage account to another brokerage account when both accounts are controlled by the Insider);

(iv) sales of Arrowhead's securities as a selling stockholder in a registered public offering, in accordance with applicable securities laws;

(v) any other purchase of Arrowhead's securities from Arrowhead, or sales of Arrowhead's securities to Arrowhead, in accordance with applicable securities and state laws;

(vi) sales of Arrowhead's securities under an effective, written trading plan (as defined in Section 4 III (c)), which has been approved by Arrowhead (including the trading plan that is formed as part of an employee's equity acceptance that allows for the sale of shares to cover their tax liability upon vesting of an equity award); or

(vii) transactions involving mutual funds that are invested in Arrowhead securities are not transactions subject to this Policy as long as (i) the Insider does not control the investment decisions on individual stocks within the fund and (ii) Arrowhead securities do not represent a substantial portion of the assets of the fund.

4. Policy

I. Do Not Trade or Cause Another to Trade While in Possession of Material, Non-public Information

(a) No Insider may trade any Arrowhead security, whether or not issued by Arrowhead, while in possession of material, non-public information about Arrowhead.

(b) No Insider may trade the security of any Arrowhead Counterparty (as defined below), while in possession of material, non-public information about the Arrowhead Counterparty. As used herein, "Arrowhead Counterparty" means another publicly traded company with which Arrowhead has a relationship, such as Arrowhead's service providers, suppliers or a firm with which Arrowhead is negotiating a major transaction, such as a joint venture, licensing agreement, or collaboration.

(c) This Policy does not restrict legitimate business communications to Arrowhead Personnel who require information to perform their business duties. An Insider, however, should not disclose material, non-public information to anyone outside of Arrowhead unless: (i) they are specifically authorized to do so, and (ii) such disclosure has been reviewed by the appropriate internal stakeholder(s), and (iii) such disclosure is made under restrictive terms of non-use and non-disclosure in accordance with Arrowhead's policies regarding the protection of authorized external disclosure (including the use of a written confidentiality agreement).

II. Quarterly Blackout Periods (applies only to Covered Persons)

(a) Quarterly Blackout Periods. All Covered Persons (and their Family Members and Controlled Entities) are prohibited from trading Arrowhead securities during quarterly blackout periods ("Quarterly Blackout Periods"). Quarterly Blackout Periods begin each fiscal year on October 15th, January 15th, April 15th and July 15th and continue until two full trading days have passed following the date Arrowhead's financial results are publicly disclosed and Arrowhead's Form 10-Q or Form 10-K is filed. During these periods, Covered Persons are presumed to possess material, non-public information about Arrowhead's financial results.

(b) Trading Windows. Covered Persons (and their Family Members and Controlled Entities) are permitted to trade in Arrowhead's securities when no Quarterly Blackout Period is in

effect. Generally, this means that Covered Persons can trade during the period beginning on the second trading day after Arrowhead announces quarterly or annual financial results until (and not including) the first day of the next fiscal quarter (October 1, January 1, April 1, July 1). However, even during this trading window, a Covered Person who is in possession of any material, non-public information may not trade Arrowhead's securities until the information becomes public or is no longer material. In addition, Arrowhead may close this trading window if a special event-specific blackout period is imposed and will re-open the trading window once the special blackout period has ended (see Section III, below).

Blackout	January 15th through 10Q filing + 2 trading days
Open	2nd trading day after 10Q filing through April 14th
Blackout	April 15th through 10Q filing + 2 trading days
Open	2nd trading day after 10Q filing through July 14th
Blackout	July 15th through 10Q filing + 2 trading days
Open	2nd trading day after 10Q filing through October 14th
Blackout	October 15th through 10K filing + 2 trading days
Open	2nd trading day after 10K filing through January 14th

III. Special Event-Specific Blackout Periods

(a) Arrowhead may determine that certain people associated with Arrowhead are in possession of material, non-public information, and may impose special blackout periods during which any Insider who has been notified by the General Counsel or their delegate that they are subject to the event-specific blackout and will be prohibited from trading in Arrowhead's securities. Any person made aware of an event-specific blackout should not disclose the existence of such blackout to anyone else. Arrowhead may impose special company-wide blackout periods at any time without prior notice.

(b) Insiders are subject to Arrowhead's pre-clearance process (described in Section IV below) which requires that all trades in Arrowhead stock must be pre-cleared under all circumstances.

(c) The trading restrictions described in this Policy do not apply to transactions under a pre-existing written plan, contract, instruction, or arrangement under SEC Rule 10b5-1 (a "Trading Plan"). The adoption, amendment, and termination of a Trading Plan must meet the requirements set forth under Rule 10b5-1 and in accordance with Arrowhead's other policies.

IV. Pre-clearance of Securities Transactions

(a) Except pursuant to an effective Trading Plan approved by Arrowhead, all Arrowhead Personnel, regardless of whether or not an Insider, must refrain from trading, without first pre-clearing all transactions in Arrowhead's securities. No Arrowhead Personnel may, directly or indirectly, trade any Arrowhead security at any time without first obtaining clearance via email from [redacted]

(b) Unless revoked, a clearance will remain valid for two weeks (i.e., 14 calendar days). If the transaction does not occur during that period, clearance for the transaction must be re-requested via email as described above. If an individual becomes aware of material, non-public information after receiving clearance but before the trade has been executed, the pre-cleared transaction may not be executed.

(c) Clearance is not required for purchases and sales of securities under an effective Trading Plan.

(d) If clearance is not expressly received, Insiders may not transact Arrowhead securities. For the avoidance of doubt, there should be no presumption that all clearance requests will be granted. Those reviewing clearance requests are under no obligation to provide an Insider the reasons for granting or failing to grant any request.

V. Prohibited Transactions:

(a) Insiders are prohibited from trading in Arrowhead's equity securities during a blackout period imposed under an "individual account" retirement or Arrowhead pension plan, during which at least 50% of the plan participants are unable to purchase, sell or otherwise acquire or transfer an interest in equity securities of Arrowhead, due to a temporary suspension of trading by Arrowhead or the plan fiduciary.

(b) Insiders are prohibited from engaging in the following transactions in Arrowhead's securities unless advance approval is obtained, in addition to the pre-clearance requirement:

(i) Short-term trading. Arrowhead directors and officers who purchase Arrowhead securities (other than through the exercise of stock options) may not sell any Arrowhead securities of the same class for at least six months after the purchase;

(ii) Options/derivatives trading. Insiders may not buy or sell publicly traded puts or calls or other derivative securities on Arrowhead's securities;

(iii) Trading on margin. If approved by Arrowhead's Board of Directors, Arrowhead officers and directors may pledge up to 75% of Arrowhead securities as collateral for a loan. Such information will be communicated to the Audit Committee periodically. No other Insiders may trade on margin or otherwise pledge Arrowhead securities; and

(iv) Hedging. Insiders may not enter into hedging or monetization transactions or similar arrangements with respect to Arrowhead securities (such as "cashless" collars, forward sales, equity swaps and other similar arrangements).

VI. Prohibited Transaction Terms:

Relevant portions of this Policy will continue to apply to an Insider's transactions in Arrowhead's securities after the Insider's employment, service, or relationship with Arrowhead has terminated, and will last until either (a) the Insider is no longer aware of material, non-public information or (b) the related information becomes public or is no longer material.

VII. Arrowhead Transactions:

Arrowhead may engage in transactions in its own securities. It is Arrowhead's policy to comply with all applicable securities and state laws (including appropriate approvals by the Board of Directors, if required) when engaging in transactions of Arrowhead's securities.

VIII. Policy Violations:

All Arrowhead Personnel who violate this Policy may be subject to disciplinary action, up to and including termination of employment.

IX. Certification:

All Arrowhead Personnel subject to this Policy are expected to have read and be familiar with this Policy and comply fully with its rules and guidelines.

KPMG LLP
Suite 1100
4655 Executive Drive
San Diego, CA 92121-3132

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the registration statements (Nos. 333-164039 and 333-161344) on Form S-1 and in registration statements (Nos. 333-235324, 333-268665, 333-228598, 333-214315, 333-214311, 333-213484, 333-202737, 333-191922, 333-188718, 333-178532, 333-178073, 333-178072, 333-144109, 333-137329, 333-132310, 333-124065, and 333-113065) on Form S-3 and in registration statements (Nos. 333-277477, 333-270779, 333-261847, 333-256255, 333-238616, 333-230621, 333-223836, 333-210117, 333-202741, 333-198920, 333-194596, 333-190970, 333-180692, 333-170252, 333-136225, 333-124066, and 333-120072) on Form S-8 of our reports dated November 26, 2024, with respect to the consolidated financial statements of Arrowhead Pharmaceuticals, Inc. and the effectiveness of internal control over financial reporting.

KPMG LLP

San Diego, California
November 26, 2024

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Forms S-1 (Nos. 333-164039 and 333-161344), Forms S-3 (Nos. 333-268665, 333-228598, 333-214315, 333-214311, 333-213484, 333-202737, 333-191922, 333-188718, 333-178532, 333-178073, 333-178072, 333-144109, 333-137329, 333-132310, 333-124065, and 333-113065), and Forms S-8 (Nos. 333-270779, 333-261847, 333-256255, 333-238616, 333-230621, 333-223836, 333-210117, 333-202741, 333-198920, 333-194596, 333-190970, 333-180692, 333-170252, 333-136225, 333-124066, and 333-120072) of Arrowhead Pharmaceuticals, Inc. of our report dated November 29, 2023, with respect to the consolidated balance sheet of Arrowhead Pharmaceuticals, Inc. and Subsidiaries as of September 30, 2023, and the related consolidated statements of operations and comprehensive loss, stockholders' equity and cash flows for each of the years in the two-year period ended September 30, 2023, which appears in the September 30, 2024 annual report on Form 10-K of Arrowhead Pharmaceuticals, Inc.

Rose, Snyder & Jacobs LLP

Encino, California

November 26, 2024

Exhibit 31.1

CERTIFICATION OF CHIEF EXECUTIVE OFFICER
PURSUANT TO RULE 13a-14(a) OR RULE 15d-14(a)
OF THE SECURITIES EXCHANGE ACT OF 1934

I, Christopher Anzalone, Chief Executive Officer of Arrowhead Pharmaceuticals, Inc., certify that:

1. I have reviewed this Annual Report on Form 10-K of Arrowhead Pharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: November 26, 2024

Signed by:
Christopher Anzalone
AFAD2C99ACF34E1...

Christopher Anzalone
Chief Executive Officer

Exhibit 31.2

CERTIFICATION OF CHIEF FINANCIAL OFFICER
PURSUANT TO RULE 13a-14(a) OR RULE 15d-14(a)
OF THE SECURITIES EXCHANGE ACT OF 1934

I, Kenneth A. Myszkowski, Chief Financial Officer of Arrowhead Pharmaceuticals, Inc., certify that:

1. I have reviewed this Annual Report on Form 10-K of Arrowhead Pharmaceuticals, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

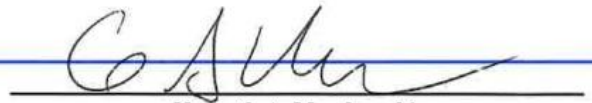
(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: November 26, 2024



Kenneth A. Myszkowski,
Chief Financial Officer

Exhibit 32.1

CERTIFICATION OF CHIEF EXECUTIVE OFFICER
PURSUANT TO RULE 13a-14(b) OR RULE 15d-14(b)
OF THE SECURITIES EXCHANGE ACT OF 1934
AND 18 U.S.C. SECTION 1350

I, Christopher Anzalone, Chief Executive Officer of Arrowhead Pharmaceuticals, Inc. (the "Company"), certify, pursuant to Rule 13(a)-14(b) or Rule 15(d)-14(b) of the Securities Exchange Act of 1934 and 18 U.S.C. Section 1350, that (i) the Annual Report on Form 10-K of the Company for the year ended September 30, 2024, fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, and (ii) the information contained in such Annual Report on Form 10-K fairly presents in all material respects the financial condition and results of operations of the Company.

Date: November 26, 2024

Signed by:
Christopher Anzalone
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Christopher Anzalone
Chief Executive Officer

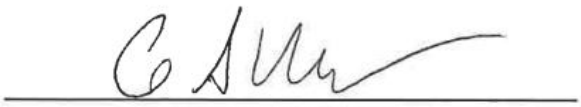
A signed original of these written statements required by 18 U.S.C. Section 1350 has been provided to Arrowhead Pharmaceuticals, Inc. and will be retained by Arrowhead Pharmaceuticals, Inc. and furnished to the Securities and Exchange Commission or its staff upon request.

Exhibit 32.2

CERTIFICATION OF CHIEF FINANCIAL OFFICER
PURSUANT TO RULE 13a-14(b) OR RULE 15d-14(b)
OF THE SECURITIES EXCHANGE ACT OF 1934
AND 18 U.S.C. SECTION 1350

I, Kenneth A. Myszkowski, Chief Financial Officer of Arrowhead Pharmaceuticals, Inc. (the "Company"), certify, pursuant to Rule 13(a)-14(b) or Rule 15(d)-14(b) of the Securities Exchange Act of 1934 and 18 U.S.C. Section 1350, that (i) the Annual Report on Form 10-K of the Company for the year ended September 30, 2024, fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, and (ii) the information contained in such Annual Report on Form 10-K fairly presents in all material respects the financial condition and results of operations of the Company.

Date: November 26, 2024



Kenneth A. Myszkowski
Chief Financial Officer

A signed original of these written statements required by 18 U.S.C. Section 1350 has been provided to Arrowhead Pharmaceuticals, Inc. and will be retained by Arrowhead Pharmaceuticals, Inc. and furnished to the Securities and Exchange Commission or its staff upon request.