

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549**

FORM 10-Q

(Mark One)

QUARTERLY REPORT UNDER SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the quarterly period ended June 30, 2021

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

Commission file number 001-38042

ARROWHEAD PHARMACEUTICALS, INC.
(Exact name of registrant as specified in its charter)

Delaware
(State of incorporation)

46-0408024
(I.R.S. Employer Identification No.)

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

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

| Title of each class | Trading Symbol(s) | Name of each exchange on which registered |
|---|-------------------|---|
| Common Stock, Par Value \$0.001 per share | ARWR | The Nasdaq Global Select Market |

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 | <input checked="" type="checkbox"/> | Accelerated Filer | <input type="checkbox"/> |
| Non-Accelerated Filer | <input type="checkbox"/> | Smaller Reporting Company | <input type="checkbox"/> |
| Emerging Growth Company | <input type="checkbox"/> | | |

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 is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

The number of shares of the registrant's common stock outstanding as of August 2, 2021 was 104,259,256.

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PART I. FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS

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

| | (unaudited) June 30, 2021 | September 30, 2020 |
|--|------------------------------|--------------------|
| ASSETS | | |
| CURRENT ASSETS | | |
| Cash and cash equivalents | \$ 325,981 | \$ 143,583 |
| Accounts receivable | 671 | 845 |
| Prepaid expenses | 7,276 | 4,250 |
| Other current assets | 1,696 | 1,782 |
| Marketable securities | 126,407 | 85,020 |
| Short term investments | 63,924 | 86,890 |
| TOTAL CURRENT ASSETS | 525,955 | 322,370 |
| Property and equipment, net | 47,786 | 30,881 |
| Intangible assets, net | 14,088 | 15,363 |
| Long term investments | 128,376 | 137,487 |
| Operating Lease - Right-of-use assets | 18,450 | 16,138 |
| Other assets | 272 | 265 |
| TOTAL ASSETS | \$ 734,927 | \$ 522,504 |
| LIABILITIES AND STOCKHOLDERS' EQUITY | | |
| CURRENT LIABILITIES | | |
| Accounts payable | \$ 10,037 | \$ 6,829 |
| Accrued expenses | 29,525 | 5,405 |
| Accrued payroll and benefits | 3,648 | 8,061 |
| Lease liabilities | 1,290 | 1,095 |
| Deferred revenue | 150,934 | 19,291 |
| TOTAL CURRENT LIABILITIES | 195,434 | 40,681 |
| LONG-TERM LIABILITIES | | |
| Lease liabilities, net of current portion | 22,854 | 20,044 |
| Deferred revenue, net of current portion | 79,749 | - |
| TOTAL LONG-TERM LIABILITIES | 102,603 | 20,044 |
| Commitments and contingencies (Note 7) | | |
| STOCKHOLDERS' EQUITY | | |
| Arrowhead Pharmaceuticals, Inc. stockholders' equity: | | |
| Common stock, \$0.001 par value; 145,000 shares authorized; 104,209 and 102,376 shares issued and outstanding as of June 30, 2021 and September 30, 2020, respectively | 197 | 195 |
| Additional paid-in capital | 1,017,949 | 965,410 |
| Accumulated other comprehensive income | 62 | 18 |
| Accumulated deficit | (581,318) | (503,844) |
| TOTAL STOCKHOLDERS' EQUITY | 436,890 | 461,779 |
| TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY | \$ 734,927 | \$ 522,504 |

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

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

| | Three Months Ended June 30, | | Nine Months Ended June 30, | |
|--|-----------------------------|---------------|----------------------------|----------------|
| | 2021 | 2020 | 2021 | 2020 |
| REVENUE | \$ 45,891 | \$ 27,376 | \$ 100,004 | \$ 80,359 |
| OPERATING EXPENSES | | | | |
| Research and development | 59,325 | 32,573 | 140,576 | 85,390 |
| General and administrative expenses | 18,434 | 10,749 | 43,581 | 38,009 |
| TOTAL OPERATING EXPENSES | 77,759 | 43,322 | 184,157 | 123,399 |
| OPERATING INCOME (LOSS) | (31,868) | (15,946) | (84,153) | (43,040) |
| OTHER INCOME (EXPENSE) | | | | |
| Interest income, net | 1,280 | 2,335 | 4,972 | 6,920 |
| Other income (expense) | 664 | - | 1,707 | - |
| TOTAL OTHER INCOME (EXPENSE) | 1,944 | 2,335 | 6,679 | 6,920 |
| INCOME (LOSS) BEFORE INCOME TAXES | (29,924) | (13,611) | (77,474) | (36,120) |
| Provision for income taxes | - | - | - | - |
| NET INCOME (LOSS) | (29,924) | (13,611) | (77,474) | (36,120) |
| NET INCOME (LOSS) PER SHARE - BASIC | \$ (0.29) | \$ (0.13) | \$ (0.75) | \$ (0.36) |
| NET INCOME (LOSS) PER SHARE - DILUTED | \$ (0.29) | \$ (0.13) | \$ (0.75) | \$ (0.36) |
| Weighted average shares outstanding - basic | 104,099 | 101,843 | 103,569 | 100,184 |
| Weighted average shares outstanding - diluted | 104,099 | 101,843 | 103,569 | 100,184 |
| OTHER COMPREHENSIVE INCOME (LOSS), NET OF TAX: | | | | |
| Foreign currency translation adjustments | (40) | 454 | 44 | 216 |
| COMPREHENSIVE INCOME (LOSS) | \$ (29,964) | \$ (13,157) | \$ (77,430) | \$ (35,904) |

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

Arrowhead Pharmaceuticals, Inc.
Consolidated Statements of Stockholders' Equity
(unaudited)
(In thousands, except per share amounts)

| | Common Stock | Amount (\$) | Additional Paid-In Capital | Accumulated Other Comprehensive Income (Loss) | Accumulated Deficit | Non-controlling Interest | Totals |
|--|-----------------|---------------|----------------------------------|--|------------------------|-----------------------------|-------------------|
| Balance at March 31, 2020 | 101,748 | \$ 194 | \$ 936,354 | \$ (629) | \$ (441,800) | \$ (555) | \$ 493,564 |
| Stock-based compensation | - | - | 10,046 | - | - | - | 10,046 |
| Exercise of stock options | 303 | - | 2,133 | - | - | - | 2,133 |
| Common stock - restricted stock units vesting | 200 | - | (1) | - | - | - | (1) |
| Foreign currency translation adjustments | - | - | - | 454 | - | - | 454 |
| Net income (loss) for the three months ended June 30, 2020 | - | - | - | - | (13,611) | - | (13,611) |
| Balance at June 30, 2020 | <u>102,251</u> | <u>\$ 194</u> | <u>\$ 948,532</u> | <u>\$ (175)</u> | <u>\$ (455,411)</u> | <u>\$ (555)</u> | <u>\$ 492,585</u> |

| | Common Stock | Amount (\$) | Additional Paid-In Capital | Accumulated Other Comprehensive Income (Loss) | Accumulated Deficit | Totals |
|--|-----------------|---------------|----------------------------------|--|------------------------|-------------------|
| Balance at March 31, 2021 | 104,020 | \$ 196 | \$ 996,645 | \$ 102 | \$ (551,394) | \$ 445,549 |
| Stock-based compensation | - | - | 18,549 | - | - | 18,549 |
| Exercise of stock options | 161 | 1 | 2,755 | - | - | 2,756 |
| Common stock - restricted stock units vesting | 28 | - | - | - | - | - |
| Foreign currency translation adjustments | - | - | - | (40) | - | (40) |
| Net income (loss) for the three months ended June 30, 2021 | - | - | - | - | (29,924) | (29,924) |
| Balance at June 30, 2021 | <u>104,209</u> | <u>\$ 197</u> | <u>\$ 1,017,949</u> | <u>\$ 62</u> | <u>\$ (581,318)</u> | <u>\$ 436,890</u> |

| | Common Stock | Amount (\$) | Additional Paid-In Capital | Accumulated Other Comprehensive Income (Loss) | Accumulated Deficit | Non-controlling Interest | Totals |
|---|-----------------|---------------|----------------------------------|--|------------------------|-----------------------------|-------------------|
| Balance at September 30, 2019 | 95,506 | \$ 187 | \$ 664,086 | \$ (391) | \$ (419,291) | \$ (555) | \$ 244,036 |
| Stock-based compensation | - | - | 27,510 | - | - | - | 27,510 |
| Exercise of stock options | 989 | 1 | 6,463 | - | - | - | 6,464 |
| Common stock - restricted stock units vesting | 1,156 | 1 | (1) | - | - | - | - |
| Common stock - issued for cash | 4,600 | 5 | 250,474 | - | - | - | 250,479 |
| Foreign currency translation adjustments | - | - | - | 216 | - | - | 216 |
| Net income (loss) for the nine months ended June 30, 2020 | - | - | - | - | (36,120) | - | (36,120) |
| Balance at June 30, 2020 | <u>102,251</u> | <u>\$ 194</u> | <u>\$ 948,532</u> | <u>\$ (175)</u> | <u>\$ (455,411)</u> | <u>\$ (555)</u> | <u>\$ 492,585</u> |

| | Common Stock | Amount (\$) | Additional Paid-In Capital | Accumulated Other Comprehensive Income (Loss) | Accumulated Deficit | Totals |
|---|-----------------|---------------|----------------------------------|--|------------------------|-------------------|
| Balance at September 30, 2020 | 102,376 | \$ 195 | \$ 965,410 | \$ 18 | \$ (503,844) | \$ 461,779 |
| Stock-based compensation | - | - | 42,051 | - | - | 42,051 |
| Exercise of stock options | 981 | 1 | 10,489 | - | - | 10,490 |
| Common stock - restricted stock units vesting | 852 | 1 | (1) | - | - | - |
| Foreign currency translation adjustments | - | - | - | 44 | - | 44 |
| Net income (loss) for the nine months ended June 30, 2021 | - | - | - | - | (77,474) | (77,474) |
| Balance at June 30, 2021 | <u>104,209</u> | <u>\$ 197</u> | <u>\$ 1,017,949</u> | <u>\$ 62</u> | <u>\$ (581,318)</u> | <u>\$ 436,890</u> |

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

Arrowhead Pharmaceuticals, Inc.
Consolidated Statements of Cash Flows
(unaudited)
(In thousands, except per share amounts)

| | Nine Months Ended June 30, | |
|--|----------------------------|-------------------|
| | 2021 | 2020 |
| CASH FLOWS FROM OPERATING ACTIVITIES: | | |
| Net income (loss) | \$ (77,474) | \$ (36,120) |
| Stock-based compensation | 42,051 | 27,510 |
| Depreciation and amortization | 5,763 | 4,168 |
| Amortization/(accretion) of note premiums/discounts | 142 | 653 |
| Changes in operating assets and liabilities: | | |
| Accounts receivable | 174 | (21,031) |
| Prepaid expenses and other current assets | (2,895) | (863) |
| Deferred revenue | 211,392 | (56,530) |
| Accounts payable | 3,208 | (3,576) |
| Accrued expenses | 13,682 | (54) |
| Other | (702) | 1,302 |
| NET CASH PROVIDED BY (USED IN) OPERATING ACTIVITIES | 195,341 | (84,541) |
| CASH FLOWS FROM INVESTING ACTIVITIES: | | |
| Purchases of property and equipment | (15,368) | (10,067) |
| Purchases of investments | (95,195) | (193,964) |
| Proceeds from sale of investments | 87,130 | 29,148 |
| NET CASH PROVIDED BY (USED IN) INVESTING ACTIVITIES | (23,433) | (174,883) |
| CASH FLOWS FROM FINANCING ACTIVITIES: | | |
| Proceeds from the exercises of stock options | 10,490 | 6,464 |
| Proceeds from the issuance of common stock | - | 250,479 |
| NET CASH PROVIDED BY (USED IN) FINANCING ACTIVITIES | 10,490 | 256,943 |
| NET INCREASE (DECREASE) IN CASH | 182,398 | (2,481) |
| CASH AND CASH EQUIVALENTS AT BEGINNING OF PERIOD | 143,583 | 221,804 |
| CASH AND CASH EQUIVALENTS AT END OF PERIOD | \$ 325,981 | \$ 219,323 |

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

Arrowhead Pharmaceuticals, Inc.
Notes to Consolidated Financial Statements
(unaudited)

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”) and Arrowhead Australia Pty Ltd (“Arrowhead Australia”), (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.

NOTE 1. ORGANIZATION AND SIGNIFICANT ACCOUNTING POLICIES

Nature of Business and Recent Developments

Arrowhead Pharmaceuticals, Inc. 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, Arrowhead 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. Arrowhead’s RNAi-based therapeutics leverage this natural pathway of gene silencing. The Company’s pipeline includes ARO-APOC3 for hypertriglyceridemia, ARO-ANG3 for dyslipidemia, ARO-HSD for liver disease, ARO-ENaC for cystic fibrosis, ARO-HIF2 for renal cell carcinoma, ARO-DUX4 for facioscapulohumeral muscular dystrophy, ARO-LUNG2 for chronic obstructive pulmonary disorder, and ARO-COV for the coronavirus that causes COVID-19 and other possible future pulmonary-borne pathogens. ARO-XDH is being developed for uncontrolled gout under a collaboration agreement with Horizon Therapeutics Ireland DAC (“Horizon”). ARO-JNJ1, ARO-JNJ2 and ARO-JNJ3 are being developed for undisclosed liver-expressed targets under a collaboration agreement with Janssen Pharmaceuticals, Inc. (“Janssen”). ARO-AAT for liver disease associated with alpha-1 antitrypsin deficiency (“AATD”) was out-licensed to Takeda Pharmaceuticals U.S.A., Inc. (“Takeda”) in October 2020. JNJ3989 (formerly referred to as ARO-HBV) for chronic hepatitis B virus was out-licensed to Janssen in October 2018. Olpasiran (formerly referred to as AMG 890 or ARO-LPA) for cardiovascular disease was out-licensed to Amgen Inc. (“Amgen”) in 2016.

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

During fiscal year 2021, the Company continued to develop its pipeline and partnered candidates. The Company announced positive interim clinical data on (i) AROAAT2002, an open-label Phase 2 clinical study of ARO-AAT, the Company’s second-generation investigational RNAi therapeutic being co-developed with Takeda as a treatment for the rare genetic liver disease associated with AATD, (ii) AROHSD1001, a Phase 1/2 clinical study of ARO-HSD, the Company’s investigational RNAi therapeutic being developed as a treatment for patients with alcohol-related and nonalcohol related liver diseases, such as nonalcoholic steatohepatitis (NASH), and (iii) AROHIF21001, a Phase 1b dose-finding clinical study of ARO-HIF2, the Company’s investigational RNAi therapeutic being developed as a treatment for patients with clear cell renal cell carcinoma. The Company also presented preclinical data on the development of ARO-DUX4, the Company’s investigational RNAi therapeutic being developed as a treatment for patients with facioscapulohumeral muscular dystrophy (FSHD), at the 28th Annual FSHD Society International Research Congress. The Company hosted a key opinion leader webinar on its cardiometabolic candidates, ARO-APOC3 and ARO-ANG3, and presented positive clinical data from the Phase 1/2 clinical studies of ARO-APOC3 and ARO-ANG3 at the American Heart Association Scientific Sessions 2020. The Company filed two Investigational New Drug Applications with the United States Food and Drug Administration (the “FDA”) to begin a Phase 2b clinical study of ARO-APOC3 in patients with severe hypertriglyceridemia and a Phase 2b clinical study of ARO-ANG3 in patients with mixed dyslipidemia, and initiated these two Phase 2b clinical studies in the third quarter of fiscal year 2021. In July 2021, the Company voluntarily paused AROENaC1001, a Phase 1/2 clinical study of ARO-ENaC, the Company’s investigational RNAi therapeutic being developed as a treatment for patients with cystic fibrosis, after receiving a preliminary update from an ongoing chronic toxicology study in rats that contained unexpected signals of local lung inflammation. New screening, enrollment and any further dosing of investigational ARO-ENaC have been paused pending additional data from ongoing nonclinical toxicology studies. The Company announced two collaborations during the first three quarters of fiscal year 2021: a collaboration with Takeda to co-develop and co-commercialize ARO-AAT for alpha-1 antitrypsin-associated liver disease and a collaboration with Horizon to develop ARO-XDH, an investigational RNAi therapeutic for uncontrolled gout. In July 2021, the Company received Breakthrough Therapy designation from the FDA for ARO-AAT, which is a process designed to expedite the development and review of drugs that are intended to treat a serious 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. The Company also earned a \$10 million payment in connection with Janssen’s exercise of its option right for ARO-JNJ1 in May 2021, which option grants Janssen all rights, including licenses, and obligations to develop and commercialize ARO-JNJ1. See Note 2 for more information regarding the Company’s collaboration and license agreements.

The Company's partnered candidates under its collaboration agreements also continued to progress. Janssen began dosing patients in a Phase 2b triple combination study called REEF-1, designed to enroll up to 450 patients with chronic hepatitis B infection. The Company is currently performing discovery, optimization and preclinical research and development for ARO-JNJ1, ARO-JNJ2 and ARO-JNJ3 for Janssen as part of the Company's Research Collaboration and Option Agreement with Janssen ("Janssen Collaboration Agreement"). Under the terms of the Janssen agreements taken together, the Company has received \$175.0 million as an upfront payment, \$75.0 million in the form of an equity investment by Johnson & Johnson Innovation-JJDC, Inc. ("JJDC") in Arrowhead Common Stock, and three milestone payments totaling \$60.0 million, which include a \$10 million payment for Janssen's exercise of its option right for ARO-JNJ1 in May 2021. The Company may receive up to \$1.6 billion in additional development and sales milestones payments for the Janssen License Agreement, and up to \$1.9 billion in additional development and sales milestone payments for the three additional targets covered under the Janssen Collaboration Agreement. The Company is further eligible to receive tiered royalties on product sales up to mid-teens under the Janssen License Agreement and up to low teens under the Janssen Collaboration Agreement.

The Company's collaboration agreement with Amgen for Olpasiran (previously referred to as AMG 890 or ARO-LPA) (the "Second Collaboration and License Agreement" or "Olpasiran Agreement") continues to progress. In July 2020, Amgen initiated a Phase 2 clinical study, which resulted in a \$20.0 million milestone payment to the Company. The Company has received \$35.0 million in upfront payments, \$21.5 million in the form of an equity investment by Amgen in the Company's Common Stock, \$30.0 million in milestone payments, and may receive up to an additional \$400.0 million in remaining development, regulatory and sales milestone payments. The Company is eligible to receive up to low double-digit royalties for sales of products under the Olpasiran Agreement.

On October 7, 2020, the Company entered into an Exclusive License and Co-Funding Agreement with Takeda (the "Takeda License Agreement"). Under the Takeda License Agreement, Takeda and the Company will co-develop the Company's ARO-AAT program. Within the United States, ARO-AAT, if approved, will be co-commercialized under a 50/50 profit sharing structure. Outside the United States, Takeda will lead the global commercialization strategy and receive an exclusive license to commercialize ARO-AAT with the Company eligible to receive tiered royalties of 20% to 25% on net sales. In January 2021, the Company received \$300.0 million as an upfront payment and is eligible to receive potential development, regulatory and commercial milestones of up to \$740.0 million.

On June 18, 2021, the Company entered into a Collaboration and License Agreement (the "Horizon License Agreement") with Horizon Therapeutics Ireland DAC ("Horizon"). Under the Horizon License Agreement, Horizon has received a worldwide exclusive license for ARO-XDH, a previously undisclosed discovery-stage investigational RNAi therapeutic being developed by the Company as a potential treatment for people with uncontrolled gout. The Company will conduct all activities through the preclinical stages of development of ARO-XDH, and Horizon will be wholly responsible for clinical development and commercialization of ARO-XDH. In July 2021, the Company received \$40 million as an upfront payment and is eligible to receive up to \$660 million in potential development, regulatory and sales milestones. The Company is also eligible to receive royalties in the low- to mid-teens range on net product sales.

The revenue recognition for these collaboration agreements is discussed further in Note 2 below.

The Company is actively monitoring the ongoing COVID-19 pandemic. The financial results for the three and nine months ended June 30, 2021 were not significantly impacted by COVID-19. During fiscal year 2020, the Company had temporarily paused enrollment in its two ARO-AAT studies, SEQUOIA and the ARO-AAT 2002 study, but resumed the process of screening and enrolling patients. During the pause in enrollment, patients already enrolled in these studies continued to be dosed per protocol and continued to come in for their follow up visits. Additional delays have occurred in the Company's earlier stage programs. Additionally, the Company's operations at its research and development facilities in Madison, Wisconsin and San Diego, California, and its corporate headquarters in Pasadena, California have continued to operate with limited impact, other than for enhanced safety measures, including work from home policies. However, the Company cannot predict the impact the progression of COVID-19 will have on future financial results due to a variety of factors including the ability of the Company's clinical sites to continue to enroll subjects, the ability of the Company's suppliers to continue to operate, the continued good health and safety of the Company's employees, and ultimately the length and severity of the COVID-19 pandemic.

Liquidity

The Consolidated Financial Statements have been prepared in conformity with the accounting principles generally accepted in the United States of America ("GAAP"), which contemplate the continuation of the Company as a going concern. Historically, the Company's primary sources of financing have been through the sale of its securities and revenue from its collaboration agreements. Research and development activities have required significant capital investment since the Company's inception. The Company expects its operations to continue to require cash investment to pursue its research and development goals, including clinical trials and related drug manufacturing.

At June 30, 2021, the Company had \$326.0 million in cash and cash equivalents (including \$2.4 million in restricted cash), \$63.9 million in short-term investments, \$126.4 million in marketable securities and \$128.4 million in long-term investments to fund operations. During the nine months ended June 30, 2021, the Company's cash and investments balance increased by \$191.7 million, which was primarily the result of the \$300.0 million upfront payment from the Takeda License Agreement, partially offset by cash used to fund the Company's research and development operations and general and administrative expenses.

Summary of Significant Accounting Policies

There have been no changes to the significant accounting policies disclosed in the Company's most recent Annual Report on Form 10-K.

Recent Accounting Pronouncements

In November 2018, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2018-18 Collaborative Arrangements (Topic 808). This update provides clarification on the interaction between Revenue Recognition (Topic 606) and Collaborative Arrangements (Topic 808) including the alignment of unit of account guidance between the two topics. ASU 2018-18 became effective for the Company on October 1, 2020 and did not have a material impact on its Consolidated Financial Statements.

In August 2018, the FASB issued ASU No. 2018-15 Intangibles—Goodwill and Other—Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract. The new standard requires that certain implementation costs for cloud computing arrangements are capitalized and amortized over the term of the associated hosted cloud computing arrangement service. Capitalized implementation costs are classified in prepaid expenses and other assets. The amortization of the capitalized asset is presented in the same line on the statement of operations and comprehensive loss as the fees for the associated hosted cloud computing arrangement service and not included with depreciation or amortization expense related to property and equipment or intangible assets. Cash flows related to capitalized implementation costs are presented in cash flows used in operating activities. ASU 2018-15 became effective for the Company on October 1, 2020 and did not have a material impact on its Consolidated Financial Statements.

NOTE 2. COLLABORATION AND LICENSE AGREEMENTS

Amgen Inc.

On September 28, 2016, the Company entered into two collaboration and license agreements and a common stock purchase agreement with Amgen. Under the Second Collaboration and License Agreement or Olpasiran Agreement, Amgen has received a worldwide, exclusive license to Arrowhead'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 other collaboration and license agreement (the "First Collaboration and License Agreement" or the "ARO-AMG1 Agreement"), Amgen received an option to a worldwide, exclusive license for ARO-AMG1, an RNAi therapy for an undisclosed genetically validated cardiovascular target. In both agreements, Amgen is wholly responsible for clinical development and commercialization. Under the terms of the agreements taken together, the Company has received \$35.0 million in upfront payments, \$21.5 million in the form of an equity investment by Amgen in the Company's Common Stock, and \$30.0 million in milestone payments, and may receive up to an additional \$400.0 million in remaining development, regulatory and sales milestone payments. The Company is further eligible to receive up to low double-digit royalties for sales of products under the Olpasiran Agreement. In July 2019, Amgen informed the Company that it would not be exercising its option for an exclusive license for ARO-AMG1, and as such, there will be no further milestone or royalty payments under the ARO-AMG1 Agreement.

The Company substantially completed its performance obligations under the Olpasiran Agreement and the ARO-AMG1 Agreement. Future milestones and royalties achieved will be recognized in their entirety when earned. In July 2020, Amgen initiated a Phase 2 clinical study of Olpasiran, which resulted in a \$20.0 million milestone payment to the Company. During the three months ended June 30, 2021 and 2020, the Company recognized \$0 and \$20.0 of revenue, respectively. During the nine months ended June 30, 2021 and 2020, the Company recognized \$0 and \$20.0 million of revenue, respectively. As of June 30, 2021, there were \$0 in contract assets recorded as accounts receivable and \$0 of contract liabilities recorded as current deferred revenue on the Company's Consolidated Balance Sheets.

Janssen Pharmaceuticals, Inc.

On October 3, 2018, the Company entered into the Janssen License Agreement and the Janssen Collaboration Agreement with Janssen, part of the Janssen Pharmaceutical Companies of Johnson & Johnson. The Company also entered into a stock purchase agreement with JJDC ("JJDC Stock Purchase Agreement"). Under the Janssen License Agreement, Janssen has received a worldwide, exclusive license to the Company's JNJ-3989 (ARO-HBV) program, the Company's third-generation subcutaneously administered

RNAi therapeutic candidate being developed as a potential therapy for patients with chronic hepatitis B virus infection. Beyond the Company's Phase 1/2 study of JNJ-3989 (ARO-HBV), which the Company is responsible for completing, Janssen is wholly responsible for clinical development and commercialization of JNJ-3989. Under the Janssen Collaboration Agreement, Janssen will be able to select three new targets against which Arrowhead will develop clinical candidates. These candidates are subject to certain restrictions and do not include candidates that already were in the Company's pipeline. The Company will perform discovery, optimization and preclinical research and development, entirely funded by Janssen, which on its own or in combination with Janssen development work, is sufficient to allow the filing of a U.S. Investigational New Drug Application or equivalent, at which time Janssen will have the option to take an exclusive license. If the option is exercised, Janssen will be wholly responsible for clinical development and commercialization of each optioned candidate. Under the terms of the agreements taken together, the Company has received \$175.0 million as an upfront payment, \$75.0 million in the form of an equity investment by JJDC in Arrowhead Common Stock under the JJDC Stock Purchase Agreement, and three milestone payments totaling \$60.0 million, and may receive up to \$1.6 billion in development and sales milestones payments for the Janssen License Agreement, and up to \$1.9 billion in development and sales milestone payments for the three additional targets covered under the Janssen Collaboration Agreement. The Company is further eligible to receive tiered royalties on product sales up to mid-teens under the Janssen License Agreement and up to low teens under the Janssen Collaboration Agreement.

The Company has evaluated these agreements in accordance with FASB Topic 606 - Revenue for Contracts from Customers, which became effective for the Company on October 1, 2018. At the inception of these agreements, the Company identified one distinct performance obligation. Regarding the Janssen License Agreement, the Company determined that the key deliverables included the license and certain R&D services including the Company's responsibility to complete the Phase 1/2 study of JNJ-3989 (ARO-HBV) and the Company's responsibility to ensure certain manufacturing of JNJ-3989 (ARO-HBV) drug product is completed and delivered to Janssen (the "Janssen R&D Services"). Due to the specialized and unique nature of these Janssen 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. The Company also determined that Janssen's option to require the Company to develop up to three new targets is not a material right and, thus, not a performance obligation at the onset of the agreement. The consideration for this option is accounted for separately.

The Company determined the transaction price totaled approximately \$252.7 million, which includes the upfront payment, the premium paid by JJDC for its equity investment in the Company, two \$25.0 million milestone payments related to JNJ-3989 (ARO-HBV), and estimated payments for reimbursable Janssen R&D Services to be performed. The Company has allocated the total \$252.7 million initial transaction price to its one distinct performance obligation for the JNJ-3989 (ARO-HBV) license and the associated Janssen R&D Services. This revenue will be recognized using a proportional performance method (based on actual costs incurred versus total estimated costs incurred) beginning in October 2018 and ending as the Company's efforts in overseeing the Phase 1/2 clinical trial are completed. During the three months ended June 30, 2021 and 2020, the Company recognized approximately \$0 million and \$6.9 million of revenue associated with this performance obligation, respectively. During the nine months ended June 30, 2021 and 2020, the Company recognized approximately \$20.2 million and \$57.9 million of revenue associated with this performance obligation, respectively. As of June 30, 2021, there were \$0.4 million in contract assets recorded as accounts receivable, and \$0 of contract liabilities recorded as current deferred revenue on the Company's Consolidated Balance Sheets.

The Company has begun to conduct its discovery, optimization and preclinical research and development of ARO-JNJ1, ARO-JNJ2 and ARO-JNJ3 under the Janssen Collaboration Agreement. All costs and labor hours spent by the Company will be entirely funded by Janssen. During the three months ended June 30, 2021 and 2020, the Company recognized \$0.2 million and \$0.4 million of revenue associated with these efforts, respectively. During the nine months ended June 30, 2021 and 2020, the Company recognized \$0.5 million and \$2.4 million of revenue associated with these efforts, respectively. In May 2021, Janssen exercised its option right for ARO-JNJ1, which resulted in a \$10.0 million milestone payment to the Company. This \$10 million milestone payment was recognized entirely during the three months ended June 30, 2021. As of June 30, 2021, there were \$0.3 million of contract assets recorded as accounts receivable and \$0 of contract liabilities recorded as current deferred revenue on the Company's Consolidated Balance Sheets.

Takeda Pharmaceuticals U.S.A., Inc.

On October 7, 2020, the Company entered into the Takeda License Agreement with Takeda. Under the Takeda License Agreement, Takeda and the Company will co-develop the Company's ARO-AAT program, 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, ARO-AAT, if approved, will be co-commercialized under a 50/50 profit sharing structure. Outside the United States, Takeda will lead the global commercialization strategy and receive an exclusive license to commercialize ARO-AAT with the Company eligible to receive tiered royalties of 20% to 25% on net sales. In January 2021, the Company received \$300.0 million as an upfront payment and is eligible to receive potential development, regulatory and commercial milestones of up to \$740.0 million.

The Company has evaluated the Takeda License Agreement in accordance with FASB Topic 606 - Revenue for Contracts from Customers, which became effective for the Company on October 1, 2018. 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 ARO-AAT 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. The Company will co-fund certain of the development and commercialization costs that Takeda manages, and these co-funding amounts will be recorded as Research and Development Expenses or General and Administrative Expenses, as appropriate.

The Company determined the initial transaction price totaled approximately \$300.0 million, which includes the upfront payment. The Company has excluded any future estimated milestones, royalties, or profit-sharing payments from this transaction price to date. The Company has allocated the total \$300.0 million initial transaction price to its one distinct performance obligation for the ARO-AAT license and the associated Takeda R&D Services. Revenue will be recognized using a proportional performance method (based on actual costs incurred versus total estimated costs incurred for the Takeda R&D Services). Revenue for the three months ended June 30, 2021 and 2020 was \$35.7 million and \$0, respectively. Revenue for the nine months ended June 30, 2021 and 2020 was \$69.3 million and \$0, respectively. As of June 30, 2021, there were \$0 in contract assets recorded as accounts receivable, \$150.9 million in contract liabilities recorded as deferred revenue and \$79.7 million in contract liabilities recorded as deferred revenue, net of the current portion.

Horizon Therapeutics Ireland DAC

On June 18, 2021, the Company entered into the Horizon License Agreement with Horizon. Under the Horizon License Agreement, Horizon has received a worldwide exclusive license for ARO-XDH, a previously undisclosed discovery-stage investigational RNAi therapeutic being developed by the Company as a potential treatment for people with uncontrolled gout. The Company will conduct all activities through the preclinical stages of development of ARO-XDH, and Horizon will be wholly responsible for clinical development and commercialization of ARO-XDH. In July 2021, the Company received \$40 million as an upfront payment and is eligible to receive up to \$660 million in potential development, regulatory and sales milestones. The Company is also eligible to receive royalties in the low- to mid-teens range on net product sales.

The Company has evaluated the Horizon License Agreement in accordance with FASB Topic 606 - Revenue for Contracts from Customers, which became effective for the Company on October 1, 2018. 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 ARO-XDH (the "Horizon R&D Services"). Due to the specialized and unique nature of these Horizon 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 Horizon R&D Services, which are the responsibility of the Company, Horizon will be responsible for managing future clinical development and commercialization of ARO-XDH.

The Company determined the initial transaction price totaled approximately \$40.0 million, which includes the upfront payment. The Company will exclude any future estimated milestones, royalties, or profit-sharing payments from this transaction price to date. The Company will allocate the total \$40.0 million initial transaction price to its one distinct performance obligation for the ARO-XDH license and the associated Horizon R&D Services. Revenue will be recognized using a proportional performance method. At June 30, 2021, no amounts were recorded on the Company's Consolidated Balance Sheets or Consolidated Statements of Operations and Comprehensive Income (Loss), as the Company has not performed any substantive Horizon R&D Services.

NOTE 3. PROPERTY AND EQUIPMENT

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

| | June 30, 2021 | September 30, 2020 |
|---|------------------|--------------------|
| | (In thousands) | |
| Computers, office equipment and furniture | \$ 1,163 | \$ 662 |
| Research equipment | 23,972 | 20,654 |
| Software | 509 | 631 |
| Leasehold improvements | 42,934 | 25,238 |
| Total gross fixed assets | 68,578 | 47,185 |
| Less: Accumulated depreciation and amortization | (20,792) | (16,304) |
| Property and equipment, net | <u>\$ 47,786</u> | <u>\$ 30,881</u> |

Depreciation and amortization expense for property and equipment for the three months ended June 30, 2021 and 2020 was \$1.6 million and \$1.1 million, respectively. Depreciation and amortization expense for property and equipment for the nine months ended June 30, 2021 and 2020 was \$4.5 million and \$2.9 million, respectively.

NOTE 4. INVESTMENTS

Investments at June 30, 2021 primarily consisted of corporate bonds that have maturities of less than 36 months, a certificate of deposit and marketable equity securities. The Company's corporate bonds consist of both short-term and long-term bonds and are classified as "held-to-maturity" on the Company's Consolidated Balance Sheets. The Company's certificate of deposit matures in less than 24 months and is classified as "held-to-maturity" on the Company's Consolidated Balance Sheet. The Company's marketable equity securities consist of mutual funds that primarily invest in U.S. government bonds, U.S. government agency bonds, corporate bonds and other asset-backed debt securities. Dividends from these funds are automatically reinvested. The Company may also invest excess cash balances in money market accounts, government-sponsored enterprise securities, and/or commercial paper. The Company accounts for its held to maturity investments in accordance with FASB ASC 320, Investments – Debt and Equity Securities and its marketable equity securities in accordance with ASC 321, Investments – Equity Securities.

The following tables summarize the Company's short-term and long-term investments and marketable securities as of June 30, 2021 and September 30, 2020 by measurement category.

Held to Maturity

| | As of June 30, 2021 | | | |
|---|---------------------|------------------------------|-------------------------------|-------------------|
| | (In thousands) | | | |
| | Amortized Cost | Gross Unrealized Gains | Gross Unrealized Losses | Fair Value |
| Commercial notes (due within one year) | \$ 63,924 | \$ 711 | \$ - | \$ 64,635 |
| Commercial notes (due within one through three years) | \$ 78,376 | \$ 1,996 | \$ - | \$ 80,372 |
| Certificate of deposit (due within two years) | \$ 50,000 | \$ - | \$ - | \$ 50,000 |
| Total | <u>\$ 192,300</u> | <u>\$ 2,707</u> | <u>\$ -</u> | <u>\$ 195,007</u> |

| | As of September 30, 2020 | | | |
|---|--------------------------|------------------------------|-------------------------------|-------------------|
| | (In thousands) | | | |
| | Amortized Cost | Gross Unrealized Gains | Gross Unrealized Losses | Fair Value |
| Commercial notes (due within one year) | \$ 86,890 | \$ 1,590 | \$ - | \$ 88,480 |
| Commercial notes (due within one through three years) | \$ 137,487 | \$ 4,573 | \$ (79) | \$ 141,981 |
| Total | <u>\$ 224,377</u> | <u>\$ 6,163</u> | <u>\$ (79)</u> | <u>\$ 230,461</u> |

Fair Value

| | As of June 30, 2021 | | | | |
|-----------------------|---------------------|----------------------------|------------------------------|-------------------------------|-------------------|
| | (In thousands) | | | | |
| | Cost | Realized Gains/(Losses) | Gross Unrealized Gains | Gross Unrealized Losses | Fair Value |
| Marketable securities | \$ 125,000 | \$ 1,796 | \$ 204 | \$ (593) | \$ 126,407 |
| Total | <u>\$ 125,000</u> | <u>\$ 1,796</u> | <u>\$ 204</u> | <u>\$ (593)</u> | <u>\$ 126,407</u> |

| | As of September 30, 2020 | | | | |
|-----------------------|--------------------------|----------------------------|------------------------------|-------------------------------|------------------|
| | (In thousands) | | | | |
| | Cost | Realized Gains/(Losses) | Gross Unrealized Gains | Gross Unrealized Losses | Fair Value |
| Marketable securities | \$ 85,000 | \$ 95 | \$ - | \$ (75) | \$ 85,020 |
| Total | <u>\$ 85,000</u> | <u>\$ 95</u> | <u>\$ -</u> | <u>\$ (75)</u> | <u>\$ 85,020</u> |

Realized gains for marketable securities recorded at fair value consist of dividends received and re-invested into the associated fund.

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 license agreement associated with the Novartis RNAi asset acquisition is being amortized over the estimated life remaining at the time of acquisition, which was 21 years, and the accumulated amortization of the asset is \$0.9 million. The patents associated with the Novartis RNAi asset acquisition are being amortized over the estimated life remaining at the time of acquisition, which was 14 years, and the accumulated amortization of the assets is \$9.8 million. Amortization expense for the three months ended June 30, 2021 and 2020 was \$0.4 million and \$0.4 million, respectively. Amortization expense for the nine months ended June 30, 2021 and 2020 was \$1.3 million and \$1.3 million, respectively. Amortization expense is expected to be \$0.4 million for the remainder of 2021, \$1.7 million in 2022, \$1.7 million in 2023, \$1.7 million in 2024, \$1.7 million in 2025 and \$6.9 million thereafter.

The following table provides details on the Company's intangible asset balances:

| | Intangible assets subject to amortization (in thousands) |
|-------------------------------|--|
| Balance at September 30, 2020 | \$ 15,363 |
| Impairment | - |
| Amortization | (1,275) |
| Balance at June 30, 2021 | <u>\$ 14,088</u> |

NOTE 6. STOCKHOLDERS' EQUITY

At June 30, 2021, the Company had a total of 150,000,000 shares of capital stock authorized for issuance, consisting of 145,000,000 shares of Common Stock, par value \$0.001 per share, and 5,000,000 shares of Preferred Stock, par value \$0.001 per share.

At June 30, 2021, 104,209,347 shares of Common Stock were outstanding. At June 30, 2021, 15,381,164 shares of Common Stock were reserved for issuance upon exercise of options and vesting of restricted stock units granted or available for grant under Arrowhead's 2004 Equity Incentive Plan, 2013 Incentive Plan, and 2021 Incentive Plan, as well as for inducement grants made to new employees under Rule 5635(c)(4) of the Nasdaq Listing Rules.

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 the nine months ended June 30, 2021.

Purchase Commitments

In the normal course of business, the Company enters into various purchase commitments for the manufacture of drug components, for toxicology studies and for clinical studies. As of June 30, 2021, these future commitments were estimated at approximately \$177.4 million, of which approximately \$39.0 million is expected to be incurred during the remainder of fiscal year 2021.

Technology License Commitments

The Company has licensed from third parties the rights to use certain technologies for its research and development activities, as well as in any products the Company may develop using these licensed technologies. These agreements and other similar agreements often require milestone and royalty payments. Milestone payments, for example, may be required as the research and development process progresses through various stages of development, such as when clinical candidates enter or progress through clinical trials, upon a new drug application and upon certain sales level milestones. These milestone payments could amount to the mid to upper double-digit millions of dollars. During the three and nine months ended June 30, 2021, the Company did not reach any milestones. During the three and nine months ended June 30, 2020, the Company accrued milestone payments of \$0 and \$0.9 million, respectively, related to the progression of the ARO-ENaC program. In certain agreements, the Company may be required to make mid to high single-digit percentage royalty payments based on a percentage of the sales of the relevant products.

NOTE 8. LEASES

Leases

In April 2019, the Company entered into a lease for its corporate headquarters in Pasadena, California. The 91 month office building lease between the Company and 177 Colorado Owner, LLC is for approximately 24,000 square feet of office space located at 177 E. Colorado Blvd, Pasadena, California. The increased capacity of this new office space compared to the Company's prior corporate headquarters was intended to accommodate increased personnel as the Company's pipeline of drug candidates expands and moves closer to market. Lease payments began on September 30, 2019 and are estimated to total approximately \$8.7 million over the term. The lease expires on April 30, 2027. The Company has paid approximately \$3.5 million for leasehold improvements, net of tenant improvement allowances. The lease contains an option to renew for one additional term of five years. The exercise of this option was not determined to be reasonably certain and thus was not included in lease liabilities on the Company's Consolidated Balance Sheet at June 30, 2021. On October 23, 2020, the Company entered into a lease expansion to add an additional approximately 24,000 square feet of office space at the same location for its corporate headquarters. Lease payments for the expansion began in July 2021 and the lease for the expansion expires in April 2027. The lease payments for the expansion are expected to total \$6.9 million. The Company anticipates paying approximately \$4.2 million of leasehold improvements, net of tenant improvement allowances, for the lease expansion. The increased capacity of this additional office space compared to the Company's current corporate headquarters is intended to accommodate increased personnel as the Company's pipeline of drug candidates continues to expand and move closer to market.

In January 2016, the Company entered into a lease for its research facility in Madison, Wisconsin. The lease is for approximately 60,000 square feet of office and laboratory space and has an expiration date of September 30, 2026. The lease was amended in January 2019 and May 2020 to expand the rentable square feet by an additional 40,000 total square feet and extend the lease expiration date to September 30, 2031. Lease payments are estimated to total approximately \$26.2 million for the term. The Company incurred approximately \$11.0 million of leasehold improvements for the additional 40,000 square feet, net of tenant improvement allowances. The lease contains two options to renew for two additional terms of five years. The exercise of these options were not determined to be reasonably certain and thus was not included in lease liabilities on the Company's Consolidated Balance Sheet at June 30, 2021. In November 2020 and December 2020, the Company entered into amendments to expand the rentable square space by an additional 10,743 square feet and these amendments added a total of approximately \$1.2 million of lease payments for the remainder of the term.

In March 2020, the Company entered into a sublease agreement (the “Sublease”) with Halozyme, Inc. for additional research and development facility space in San Diego, California. The Sublease provides additional space needed to accommodate the recent growth of the Company’s personnel and discovery efforts. The Sublease is for approximately 21,000 rentable square feet. The term of the Sublease commenced on April 1, 2020 and will end on January 14, 2023. Sublease payments are estimated to total approximately \$2.0 million over the term.

Operating lease cost during the three months ended June 30, 2021 and 2020 was \$1.6 million and \$0.8 million, respectively. Operating lease cost during the nine months ended June 30, 2021 and 2020 was \$3.6 million and \$1.7 million, respectively. Variable lease costs for the three months ended June 30, 2021 and 2020 was \$0.1 million and \$0.2 million, respectively. Variable lease costs for the nine months ended June 30, 2021 and 2020 was \$0.6 million and \$0.6 million, respectively. There was no short-term lease cost during the three and nine months ended June 30, 2021 and 2020.

The following table presents maturities of operating lease liabilities on an undiscounted basis as of June 30, 2021:

| | (in thousands) |
|---|------------------|
| 2021 (remainder of fiscal year) | \$ 964 |
| 2022 | 4,522 |
| 2023 | 4,624 |
| 2024 | 4,523 |
| 2025 | 4,649 |
| 2026 and thereafter | 17,422 |
| Total | \$ 36,704 |
| Less imputed interest | (12,560) |
| Total operating lease liabilities (includes current portion) | \$ 24,144 |

Cash paid for the amounts included in the measurement of the operating lease liabilities on the Company’s Consolidated Balance Sheet and included in Other changes in operating assets and liabilities within cash flows from operating activities on the Company’s Consolidated Statement of Cash Flow for the nine months ended June 30, 2021 and 2020 was \$2.2 million and \$1.1 million, respectively. The weighted-average remaining lease term and weighted-average discount rate for all leases as of June 30, 2021 was 8.3 years and 8.5%, respectively.

NOTE 9. STOCK-BASED COMPENSATION

Arrowhead has three plans that provide for equity-based compensation. Under the 2004 Equity Incentive Plan and the 2013 Incentive Plan, as of June 30, 2021, 429,141 and 5,293,368 shares, respectively, of Arrowhead’s Common Stock are reserved for the grant of stock options, stock appreciation rights, restricted stock awards and performance unit/share awards to employees, consultants and others. No further grants may be made under the 2004 Equity Incentive Plan. As of June 30, 2021, there were options granted and outstanding to purchase 429,141 and 2,127,918 shares of Common Stock under the 2004 Equity Incentive Plan and the 2013 Incentive Plan, respectively, and there were 3,165,450 restricted stock units granted and outstanding under the 2013 Incentive Plan. Also, as of June 30, 2021, there were 1,001,516 shares reserved for options and 636,700 shares reserved for restricted stock units issued as inducement grants to new employees outside of equity compensation plans. On March 18, 2021, the Company’s stockholders approved the Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan (“2021 Incentive Plan”), which authorizes 8,000,000 shares (subject to certain adjustments) to be awarded for grants of stock options, stock appreciation rights, restricted and unrestricted stock and stock units, performance awards, cash awards and other awards convertible into or otherwise based on shares of Arrowhead’s Common Stock. The maximum number of shares authorized under the 2021 Incentive Plan will be (i) reduced by any shares subject to awards made under the 2013 Incentive Plan after January 1, 2021, and (ii) increased by any shares subject to outstanding awards under the 2013 Incentive 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 June 30, 2021, there were options granted and outstanding to purchase 18,000 shares of Common Stock and 43,500 restricted stock units granted and outstanding under the 2021 Incentive Plan. As of June 30, 2021, the total number of authorized shares under the 2021 Incentive Plan was 8,020,439 shares, which includes 81,939 shares that were forfeited under the 2013 Incentive Plan.

Stock Options

The following table summarizes information about stock options:

| | Number of Options Outstanding | Weighted- Average Exercise Price Per Share | Weighted- Average Remaining Contractual Term | Aggregate Intrinsic Value |
|-------------------------------|-------------------------------------|--|--|---------------------------------|
| Balance at September 30, 2020 | 4,539,403 | \$ 16.67 | | |
| Granted | 186,000 | 65.57 | | |
| Cancelled | (167,609) | 34.86 | | |
| Exercised | (981,219) | 10.69 | | |
| Balance at June 30, 2021 | 3,576,575 | \$ 20.00 | 5.9 years | \$ 224,666,017 |
| Exercisable at June 30, 2021 | 2,417,915 | \$ 11.18 | 4.7 years | \$ 173,212,122 |

Stock-based compensation expense related to stock options for the three months ended June 30, 2021 and 2020 was \$3.2 million and \$2.7 million, respectively. Stock-based compensation expense related to stock options for the nine months ended June 30, 2021 and 2020 was \$9.6 million and \$6.8 million, respectively. For non-qualified stock options, the expense creates a timing difference, resulting in a deferred tax asset, which is fully reserved by a valuation allowance.

The grant date fair value of the options granted by the Company for the three months ended June 30, 2021 and 2020 was \$0.9 million and \$3.4 million, respectively. The grant date fair value of the options granted by the Company for the nine months ended June 30, 2021 and 2020 was \$9.0 million and \$30.0 million, respectively.

The intrinsic value of the options exercised during the three months ended June 30, 2021 and 2020 was \$10.2 million and \$9.5 million, respectively. The intrinsic value of the options exercised during the nine months ended June 30, 2021 and 2020 was \$63.0 million and \$39.8 million, respectively.

As of June 30, 2021, the pre-tax compensation expense for all outstanding unvested stock options in the amount of \$31.3 million will be recognized in the Company's results of operations over a weighted average period of 2.7 years.

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 option 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, in management's opinion, the existing models do not necessarily provide a reliable single measure of the fair value of its employee stock options.

The assumptions used to value stock options are as follows:

| | Nine Months Ended June 30, | |
|---|----------------------------|--------------|
| | 2021 | 2020 |
| Dividend yield | - | - |
| Risk-free interest rate | 0.4 – 1.1% | 0.4 – 1.8% |
| Volatility | 86.2 – 90.4% | 90.5 – 91.9% |
| Expected life (in years) | 6.25 | 6.25 |
| Weighted average grant date fair value per share of options granted | \$ 48.64 | \$ 38.12 |

The dividend yield is zero as the Company currently does not pay a dividend.

The risk-free interest rate is based on that of the U.S. Treasury bond.

Volatility is estimated based on volatility average of the Company's Common Stock price.

Restricted Stock Units

Restricted stock units (“RSUs”), including time-based and performance-based awards, have been granted under the Company’s 2013 Incentive Plan, 2021 Incentive Plan, and as inducements grants granted outside of the Company’s equity-based compensation plans under Rule 5635(c)(4) of the Nasdaq Listing Rules. 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 |
|--------------------------------|-------------------|---|
| Unvested at September 30, 2020 | 3,524,025 | \$ 44.11 |
| Granted | 1,488,450 | 75.29 |
| Vested | (851,825) | 30.41 |
| Forfeited | (315,000) | 39.93 |
| Unvested at June 30, 2021 | <u>3,845,650</u> | <u>\$ 59.55</u> |

During the three months ended June 30, 2021 and 2020, the Company recorded \$15.4 million and \$7.4 million of expense related to RSUs, respectively. During the nine months ended June 30, 2021 and 2020, the Company recorded \$32.5 million and \$20.7 million of expense related to RSUs, respectively. Such expense is included in stock-based compensation expense in the Company’s Consolidated Statement of Operations and Comprehensive Income (Loss). For RSUs, the expense creates a timing difference, resulting in a deferred tax asset, which is fully reserved by a valuation allowance.

For RSUs, the grant date fair value of the award is based on the Company’s closing stock price at the grant date, with consideration given to the probability of achieving performance conditions for performance-based awards. The grant date fair value of the RSUs granted by the Company for the three months ended June 30, 2021 and 2020 was \$3.1 million and \$5.9 million, respectively. The grant date fair value of the RSUs granted by the Company for the nine months ended June 30, 2021 and 2020 was \$112.1 million and \$141.8 million, respectively.

As of June 30, 2021, the pre-tax compensation expense for all unvested RSUs in the amount of \$123.5 million will be recognized in the Company’s results of operations over a weighted average period of 2.7 years. Unvested RSUs that we have deemed not probable of vesting as of June 30, 2021, have the potential of generating an additional \$70.1 million of pre-tax compensation expense if we deem them probable of vesting in a future reporting period.

NOTE 10. FAIR VALUE MEASUREMENTS

The Company measures its financial assets and liabilities at fair value. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability (i.e., exit price) in an orderly transaction between market participants at the measurement date. Additionally, the Company is required to provide disclosure and categorize assets and liabilities measured at fair value into one of three different levels depending on the assumptions (i.e., inputs) used in the valuation. Level 1 provides the most reliable measure of fair value while Level 3 generally requires significant management judgment. Financial assets and liabilities are classified in their entirety based on the lowest level of input significant to the fair value measurement. The fair value hierarchy is defined as follows:

Level 1—Valuations are based on unadjusted quoted prices in active markets for identical assets or liabilities.

Level 2—Valuations are based on quoted prices for similar assets or liabilities in active markets, or quoted prices in markets that are not active for which significant inputs are observable, either directly or indirectly.

Level 3—Valuations are based on prices or valuation techniques that require inputs that are both unobservable and significant to the overall fair value measurement. Inputs reflect management’s best estimate of what market participants would use in valuing the asset or liability at the measurement date.

The following table summarizes fair value measurements at June 30, 2021 and September 30, 2020 for assets and liabilities measured at fair value on a recurring basis.

June 30, 2021

| | Level 1 | Level 2 | Level 3 | Total |
|---|----------------|------------|---------|------------|
| | (in thousands) | | | |
| Cash and cash equivalents | \$ 325,981 | \$ - | \$ - | \$ 325,981 |
| Marketable securities | \$ 126,407 | \$ - | \$ - | \$ 126,407 |
| Short-term investments (held to maturity) | \$ - | \$ 64,635 | \$ - | \$ 64,635 |
| Long-term investments (held to maturity) | \$ - | \$ 130,372 | \$ - | \$ 130,372 |
| Contingent consideration | \$ - | \$ - | \$ - | \$ - |

September 30, 2020:

| | Level 1 | Level 2 | Level 3 | Total |
|---|----------------|------------|---------|------------|
| | (in thousands) | | | |
| Cash and cash equivalents | \$ 143,583 | \$ - | \$ - | \$ 143,583 |
| Marketable securities | \$ 85,020 | \$ - | \$ - | \$ 85,020 |
| Short-term investments (held to maturity) | \$ - | \$ 88,480 | \$ - | \$ 88,480 |
| Long-term investments (held to maturity) | \$ - | \$ 141,981 | \$ - | \$ 141,981 |
| Contingent consideration | \$ - | \$ - | \$ - | \$ - |

ITEM 2. MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

This Quarterly Report on Form 10-Q contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, and we intend that such forward-looking statements be subject to the safe harbors created thereby. For this purpose, any statements contained in this Quarterly Report on Form 10-Q except for historical information may be deemed to be forward-looking statements. Without limiting the generality of the foregoing, words such as “may,” “will,” “expect,” “believe,” “anticipate,” “intend,” “plan,” “project,” “could,” “estimate,” “target,” “forecast,” or “continue” or the negative 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.

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. In addition, many of these risks and uncertainties may be exacerbated by the COVID-19 pandemic and any worsening of the global business and economic environment as a result. As such, our actual results may differ materially from those expressed in any forward-looking statements. Readers should carefully review the factors identified in our most recent Annual Report on Form 10-K under the caption “Risk Factors” as well as the additional risks and uncertainties described in other documents we file from time to time with the Securities and Exchange Commission (“SEC”), including our Quarterly Report on Form 10-Q for the quarter ended December 31, 2020, our Quarterly Report on Form 10-Q for the quarter ended March 31, 2021 and this Quarterly Report on Form 10-Q. 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. 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

Description of Business

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”) and Arrowhead Australia Pty Ltd (“Arrowhead Australia”), (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.

Overview

Arrowhead Pharmaceuticals, Inc. 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, Arrowhead 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. Arrowhead’s RNAi-based therapeutics leverage this natural pathway of gene silencing. The Company’s pipeline includes ARO-APOC3 for hypertriglyceridemia, ARO-ANG3 for dyslipidemia, ARO-HSD for liver disease, ARO-ENaC for cystic fibrosis, ARO-HIF2 for renal cell carcinoma, ARO-DUX4 for facioscapulohumeral muscular dystrophy, ARO-LUNG2 for chronic obstructive pulmonary disorder, and ARO-COV for the coronavirus that causes COVID-19 and other possible future pulmonary-borne pathogens. ARO-XDH is being developed for uncontrolled gout under a collaboration agreement with Horizon Therapeutics Ireland DAC (“Horizon”). ARO-JNJ1, ARO-JNJ2 and ARO-JNJ3 are being developed for undisclosed liver-expressed targets under a collaboration agreement with Janssen Pharmaceuticals, Inc. (“Janssen”). ARO-AAT for liver disease associated with alpha-1 antitrypsin deficiency (“AATD”) was out-licensed to Takeda Pharmaceuticals U.S.A., Inc. (“Takeda”) in October 2020. JNJ3989 (formerly referred to as ARO-HBV) for chronic hepatitis B virus was out-licensed to Janssen in October 2018. Olpasiran (formerly referred to as AMG 890 or ARO-LPA) for cardiovascular disease was out-licensed to Amgen Inc. (“Amgen”) in 2016.

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

Arrowhead has focused its resources on therapeutics that exclusively utilize the Company’s Targeted RNAi Molecule (TRiM™) platform technology. Therapeutics built on the TRiM™ platform have demonstrated high levels of pharmacologic activity in multiple animal models spanning several therapeutic areas. 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 and tumors; and the potential for improved safety and reduced risk of intracellular buildup, because there are less metabolites from smaller, simpler molecules.

During fiscal year 2021, the Company continued to develop its pipeline and partnered candidates. The Company announced positive interim clinical data on (i) AROAAT2002, an open-label Phase 2 clinical study of ARO-AAT, the Company's second-generation investigational RNAi therapeutic being co-developed with Takeda as a treatment for the rare genetic liver disease associated with AATD, (ii) AROHSD1001, a Phase 1/2 clinical study of ARO-HSD, the Company's investigational RNAi therapeutic being developed as a treatment for patients with alcohol-related and nonalcohol related liver diseases, such as nonalcoholic steatohepatitis (NASH), and (iii) AROHIF21001, a Phase 1b dose-finding clinical study of ARO-HIF2, the Company's investigational RNAi therapeutic being developed as a treatment for patients with clear cell renal cell carcinoma. The Company also presented preclinical data on the development of ARO-DUX4, the Company's investigational RNAi therapeutic being developed as a treatment for patients with facioscapulohumeral muscular dystrophy (FSHD), at the 28th Annual FSHD Society International Research Congress. The Company hosted a key opinion leader webinar on its cardiometabolic candidates, ARO-APOC3 and ARO-ANG3, and presented positive clinical data from the Phase 1/2 clinical studies of ARO-APOC3 and ARO-ANG3 at the American Heart Association Scientific Sessions 2020. The Company filed two Investigational New Drug Applications with the United States Food and Drug Administration (the "FDA") to begin a Phase 2b clinical study of ARO-APOC3 in patients with severe hypertriglyceridemia and a Phase 2b clinical study of ARO-ANG3 in patients with mixed dyslipidemia, and initiated these two Phase 2b clinical studies in the third quarter of fiscal year 2021. In July 2021, the Company voluntarily paused AROENaC1001, a Phase 1/2 clinical study of ARO-ENaC, the Company's investigational RNAi therapeutic being developed as a treatment for patients with cystic fibrosis, after receiving a preliminary update from an ongoing chronic toxicology study in rats that contained unexpected signals of local lung inflammation. New screening, enrollment and any further dosing of investigational ARO-ENaC have been paused pending additional data from ongoing nonclinical toxicology studies. The Company announced two collaborations during the first three quarters of fiscal year 2021: a collaboration with Takeda to co-develop and co-commercialize ARO-AAT for alpha-1 antitrypsin-associated liver disease and a collaboration with Horizon to develop ARO-XDH, an investigational RNAi therapeutic for uncontrolled gout. In July 2021, the Company received Breakthrough Therapy designation from the FDA for ARO-AAT, which is a process designed to expedite the development and review of drugs that are intended to treat a serious 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. The Company also earned a \$10 million payment in connection with Janssen's exercise of its option right for ARO-JNJ1 in May 2021, which option grants Janssen all rights, including licenses, and obligations to develop and commercialize ARO-JNJ1. See Note 2 for more information regarding the Company's collaboration and license agreements.

The Company's partnered candidates under its collaboration agreements also continued to progress. Janssen began dosing patients in a Phase 2b triple combination study called REEF-1, designed to enroll up to 450 patients with chronic hepatitis B infection. The Company is currently performing discovery, optimization and preclinical research and development for ARO-JNJ1, ARO-JNJ2 and ARO-JNJ3 for Janssen as part of the Company's Research Collaboration and Option Agreement with Janssen ("Janssen Collaboration Agreement"). Under the terms of the Janssen agreements taken together, the Company has received \$175.0 million as an upfront payment, \$75.0 million in the form of an equity investment by Johnson & Johnson Innovation-JJDC, Inc. ("JJDC") in Arrowhead Common Stock, and three milestone payments totaling \$60.0 million, which include a \$10 million payment for Janssen's exercise of its option right for ARO-JNJ1 in May 2021. The Company may receive up to \$1.6 billion in additional development and sales milestones payments for the Janssen License Agreement, and up to \$1.9 billion in additional development and sales milestone payments for the three additional targets covered under the Janssen Collaboration Agreement. The Company is further eligible to receive tiered royalties on product sales up to mid-teens under the Janssen License Agreement and up to low teens under the Janssen Collaboration Agreement.

The Company's collaboration agreement with Amgen for Olpasiran (previously referred to as AMG 890 or ARO-LPA) (the "Second Collaboration and License Agreement" or "Olpasiran Agreement") continues to progress. In July 2020, Amgen initiated a Phase 2 clinical study, which resulted in a \$20.0 million milestone payment to the Company. The Company has received \$35.0 million in upfront payments, \$21.5 million in the form of an equity investment by Amgen in the Company's Common Stock, \$30.0 million in milestone payments, and may receive up to an additional \$400.0 million in remaining development, regulatory and sales milestone payments. The Company is eligible to receive up to low double-digit royalties for sales of products under the Olpasiran Agreement.

On October 7, 2020, the Company entered into an Exclusive License and Co-Funding Agreement with Takeda (the "Takeda License Agreement"). Under the Takeda License Agreement, Takeda and the Company will co-develop the Company's ARO-AAT program. Within the United States, ARO-AAT, if approved, will be co-commercialized under a 50/50 profit sharing structure. Outside the United States, Takeda will lead the global commercialization strategy and receive an exclusive license to commercialize ARO-AAT with the Company eligible to receive tiered royalties of 20% to 25% on net sales. In January 2021, the Company received \$300.0 million as an upfront payment and is eligible to receive potential development, regulatory and commercial milestones of up to \$740.0 million.

On June 18, 2021, the Company entered into a Collaboration and License Agreement (the “Horizon License Agreement”) with Horizon Therapeutics Ireland DAC (“Horizon”). Under the Horizon License Agreement, Horizon has received a worldwide exclusive license for ARO-XDH, a previously undisclosed discovery-stage investigational RNAi therapeutic being developed by the Company as a potential treatment for people with uncontrolled gout. The Company will conduct all activities through the preclinical stages of development of ARO-XDH, and Horizon will be wholly responsible for clinical development and commercialization of ARO-XDH. In July 2021, the Company received \$40 million as an upfront payment and is eligible to receive up to \$660 million in potential development, regulatory and sales milestones. The Company is also eligible to receive royalties in the low- to mid-teens range on net product sales. The revenue recognition for these collaboration agreements is discussed further in Note 2 of the Notes to Consolidated Financial Statements of Part I, Item 1. *Financial Statements* of this Quarterly Report on Form 10-Q.

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 contracted to third-party manufacturers or manufactured internally. 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, relating to the preparation for and administration of clinical trials, are referred to as “candidate costs.” If the clinical candidates progress through human testing, candidate costs will increase.

The Company is actively monitoring the ongoing COVID-19 pandemic. The financial results for the three and nine months ended June 30, 2021 were not significantly impacted by COVID-19. During fiscal year 2020, the Company had temporarily paused enrollment in its two ARO-AAT studies, SEQUOIA and the ARO-AAT 2002 study, but resumed the process of screening and enrolling patients. During the pause in enrollment, patients already enrolled in these studies continued to be dosed per protocol and continued to come in for their follow up visits. Additional delays have occurred in the Company’s earlier stage programs. Additionally, the Company’s operations at its research and development facilities in Madison, Wisconsin and San Diego, California, and its corporate headquarters in Pasadena, California have continued to operate with limited impact, other than for enhanced safety measures, including work from home policies. However, the Company cannot predict the impact the progression of COVID-19 will have on future financial results due to a variety of factors including the ability of the Company’s clinical sites to continue to enroll subjects, the ability of the Company’s suppliers to continue to operate, the continued good health and safety of the Company’s employees, and ultimately the length and severity of the COVID-19 pandemic.

Net losses were \$29.9 million for the three months ended June 30, 2021 as compared to net losses of \$13.6 million for the three months ended June 30, 2020. Net losses were \$77.5 million for the nine months ended June 30, 2021 as compared to net losses of \$36.1 million for the nine months ended June 30, 2020. Net losses per share-diluted were \$0.29 for the three months ended June 30, 2021 as compared to net losses per share-diluted of \$0.13 for the three months ended June 30, 2020. Net losses per share-diluted were \$0.75 for the nine months ended June 30, 2021 as compared to net losses per share-diluted of \$0.36 for the nine months ended June 30, 2020. The increase in net losses for the three and nine months ended June 30, 2021 was due to an increase in research and development expenses as the Company’s pipeline of candidates has expanded and progressed through clinical trial phases, partially offset by an increase in revenue from the Company’s license and collaboration agreements, primarily from the Takeda collaboration.

The Company has strengthened its liquidity and financial position through upfront and milestone payments received under its collaboration agreements, as well as equity financings. Under the terms of the Company’s agreements with Janssen taken together, the Company has received \$175.0 million as an upfront payment, \$75.0 million in the form of an equity investment by JJDC in Arrowhead Common Stock, and three milestone payments totaling \$60.0 million. Under the terms of the Company’s agreements with Amgen, the Company has received \$35.0 million in upfront payments, \$21.5 million in the form of an equity investment by Amgen in the Company’s Common Stock and \$30.0 million in milestone payments. The Company’s October 2020 licensing agreement with Takeda resulted in a \$300.0 million upfront payment, which was collected in the beginning of the second quarter of 2021. The Company had \$326.0 million of cash and cash equivalents, \$126.4 million of marketable securities, \$63.9 million in short-term investments, \$128.4 million of long term investments and \$734.9 million of total assets as of June 30, 2021, as compared to \$143.6 million of cash and cash equivalents, \$85.0 million of marketable securities, \$86.9 million in short-term investments, \$137.5 million of long term investments and \$522.5 million of total assets as of September 30, 2020, respectively. 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.

Critical Accounting Policies and Estimates

There have been no changes to the significant accounting policies disclosed in the Company’s most recent Annual Report on Form 10-K.

Results of Operations

The following data summarizes our results of operations for the following periods indicated:

| | Three Months Ended June 30, | |
|-------------------------------------|--|-------------|
| | 2021 | 2020 |
| | (in thousands, except per share amounts) | |
| Revenues | \$ 45,891 | \$ 27,376 |
| Operating Income (loss) | \$ (31,868) | \$ (15,946) |
| Net Income (loss) | \$ (29,924) | \$ (13,611) |
| Net Income (Loss) per Share-Diluted | \$ (0.29) | \$ (0.13) |

| | Nine Months Ended June 30, | |
|-------------------------------------|--|-------------|
| | 2021 | 2020 |
| | (in thousands, except per share amounts) | |
| Revenues | \$ 100,004 | \$ 80,359 |
| Operating Income (loss) | \$ (84,153) | \$ (43,040) |
| Net Income (loss) | \$ (77,474) | \$ (36,120) |
| Net Income (Loss) per Share-Diluted | \$ (0.75) | \$ (0.36) |

The increase in revenue for the three and nine months ended June 30, 2021 compared to the three and nine months ended June 30, 2020 was driven by the revenue recognized for the Takeda collaboration. The increase in net losses during the three and nine months ended June 30, 2021 compared to the three and nine months ended June 30, 2020 was driven by an increase in research and development expenses as our pipeline of clinical candidates has continued to increase and progress through clinical trial phases, partially offset by an increase in revenue from the Takeda License Agreement.

Revenue

Total revenue for the three months ended June 30, 2021 and 2020 was \$45.9 million and \$27.4 million, respectively. Total revenue for the nine months ended June 30, 2021 and 2020 was \$100.0 million and \$80.4 million, respectively. Revenue for the three months ended June 30, 2021 is primarily related to the recognition of \$35.7 million of revenue associated with the Takeda License Agreement and the \$10 million milestone payment from Janssen for ARO-JNJ1. Revenue for the nine months ended June 30, 2021 is primarily related to the recognition of \$69.3 million of revenue associated with the Takeda License Agreement, the recognition of a portion of the \$252.7 million initial transaction price associated with our agreements with Janssen and JJDC for the progress we achieved towards completing our performance obligations under those agreements, and the \$10 million milestone payment from Janssen for ARO-JNJ1.

Amgen Inc.

On September 28, 2016, the Company entered into two collaboration and license agreements and a common stock purchase agreement with Amgen. Under the Second Collaboration and License Agreement or Olpasiran Agreement, Amgen has received a worldwide, exclusive license to Arrowhead'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 other collaboration and license agreement (the "First Collaboration and License Agreement" or the "ARO-AMG1 Agreement"), Amgen received an option to a worldwide, exclusive license for ARO-AMG1, an RNAi therapy for an undisclosed genetically validated cardiovascular target. In both agreements, Amgen is wholly responsible for clinical development and commercialization. Under the terms of the agreements taken together, the Company has received \$35.0 million in upfront payments, \$21.5 million in the form of an equity investment by Amgen in the Company's Common Stock, and \$30.0 million in milestone payments, and may receive up to an additional \$400.0 million in remaining development, regulatory and sales milestone payments. The Company is further eligible to receive up to low double-digit royalties for sales of products under the Olpasiran Agreement. In July 2019, Amgen informed the Company that it would not be exercising its option for an exclusive license for ARO-AMG1, and as such, there will be no further milestone or royalty payments under the ARO-AMG1 Agreement.

The Company substantially completed its performance obligations under the Olpasiran Agreement and the ARO-AMG1 Agreement. Future milestones and royalties achieved will be recognized in their entirety when earned. In July 2020, Amgen initiated a Phase 2 clinical study of Olpasiran, which resulted in a \$20.0 million milestone payment to the Company. During the three months ended June 30, 2021 and 2020, the Company recognized \$0 and \$20.0 of revenue, respectively. During the nine months ended June 30, 2021 and 2020, the Company recognized \$0 and \$20 million of revenue, respectively. As of June 30, 2021, there were \$0 in contract assets recorded as accounts receivable and \$0 of contract liabilities recorded as current deferred revenue on the Company's Consolidated Balance Sheets.

Janssen Pharmaceuticals, Inc.

On October 3, 2018, the Company entered into the Janssen License Agreement and the Janssen Collaboration Agreement with Janssen, part of the Janssen Pharmaceutical Companies of Johnson & Johnson. The Company also entered into a stock purchase agreement with JJDC (“JJDC Stock Purchase Agreement”). Under the Janssen License Agreement, Janssen has received a worldwide, exclusive license to the Company’s JNJ-3989 (ARO-HBV) program, the Company’s third-generation subcutaneously administered RNAi therapeutic candidate being developed as a potential therapy for patients with chronic hepatitis B virus infection. Beyond the Company’s Phase 1/2 study of JNJ-3989 (ARO-HBV), which the Company is responsible for completing, Janssen is wholly responsible for clinical development and commercialization of JNJ-3989. Under the Janssen Collaboration Agreement, Janssen will be able to select three new targets against which Arrowhead will develop clinical candidates. These candidates are subject to certain restrictions and do not include candidates that already were in the Company’s pipeline. The Company will perform discovery, optimization and preclinical research and development, entirely funded by Janssen, which on its own or in combination with Janssen development work, is sufficient to allow the filing of a U.S. Investigational New Drug Application or equivalent, at which time Janssen will have the option to take an exclusive license. If the option is exercised, Janssen will be wholly responsible for clinical development and commercialization of each optioned candidate. Under the terms of the agreements taken together, the Company has received \$175.0 million as an upfront payment, \$75.0 million in the form of an equity investment by JJDC in Arrowhead Common Stock under the JJDC Stock Purchase Agreement, and three milestone payments totaling \$60.0 million, and may receive up to \$1.6 billion in development and sales milestone payments for the Janssen License Agreement, and up to \$1.9 billion in development and sales milestone payments for the three additional targets covered under the Janssen Collaboration Agreement. The Company is further eligible to receive tiered royalties on product sales up to mid-teens under the Janssen License Agreement and up to low teens under the Janssen Collaboration Agreement.

The Company has evaluated these agreements in accordance with FASB Topic 606 - Revenue for Contracts from Customers, which became effective for the Company on October 1, 2018. At the inception of these agreements, the Company identified one distinct performance obligation. Regarding the Janssen License Agreement, the Company determined that the key deliverables included the license and certain R&D services including the Company’s responsibility to complete the Phase 1/2 study of JNJ-3989 (ARO-HBV) and the Company’s responsibility to ensure certain manufacturing of JNJ-3989 (ARO-HBV) drug product is completed and delivered to Janssen (the “Janssen R&D Services”). Due to the specialized and unique nature of these Janssen 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. The Company also determined that Janssen’s option to require the Company to develop up to three new targets is not a material right and, thus, not a performance obligation at the onset of the agreement. The consideration for this option is accounted for separately.

The Company determined the transaction price totaled approximately \$252.7 million, which includes the upfront payment, the premium paid by JJDC for its equity investment in the Company, two \$25.0 million milestone payments related to JNJ-3989 (ARO-HBV), and estimated payments for reimbursable Janssen R&D Services to be performed. The Company has allocated the total \$252.7 million initial transaction price to its one distinct performance obligation for the JNJ-3989 (ARO-HBV) license and the associated Janssen R&D Services. This revenue will be recognized using a proportional performance method (based on actual costs incurred versus total estimated costs incurred) beginning in October 2018 and ending as the Company’s efforts in overseeing the Phase 1/2 clinical trial are completed. During the three months ended June 30, 2021 and 2020, the Company recognized approximately \$0 million and \$6.9 million of revenue associated with this performance obligation, respectively. During the nine months ended June 30, 2021 and 2020, the Company recognized approximately \$20.2 million and \$57.9 million of revenue associated with this performance obligation, respectively. As of June 30, 2021, there were \$0.4 million in contract assets recorded as accounts receivable, and \$0 of contract liabilities recorded as current deferred revenue on the Company’s Consolidated Balance Sheets.

The Company has begun to conduct its discovery, optimization and preclinical research and development of ARO-JNJ1, ARO-JNJ2 and ARO-JNJ3 under the Janssen Collaboration Agreement. All costs and labor hours spent by the Company will be entirely funded by Janssen. During the three months ended June 30, 2021 and 2020, the Company recognized \$0.2 million and \$0.4 million of revenue associated with these efforts, respectively. During the nine months ended June 30, 2021 and 2020, the Company recognized \$0.5 million and \$2.4 million of revenue associated with these efforts, respectively. In May 2021, Janssen exercised its option right for ARO-JNJ1, which resulted in a \$10.0 million milestone payment to the Company. This \$10 million milestone payment was recognized entirely during the three months ended June 30, 2021. As of June 30, 2021, there were \$0.3 million of contract assets recorded as accounts receivable and \$0 of contract liabilities recorded as current deferred revenue on the Company’s Consolidated Balance Sheets.

Takeda Pharmaceuticals U.S.A., Inc.

On October 7, 2020, the Company entered into the Takeda License Agreement with Takeda. Under the Takeda License Agreement, Takeda and the Company will co-develop the Company’s ARO-AAT program, 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, ARO-AAT, if approved, will be co-commercialized under a 50/50 profit sharing structure. Outside the United States, Takeda will lead the global commercialization strategy and receive an exclusive license to commercialize ARO-AAT with the Company eligible to receive tiered royalties of 20% to 25% on net sales. In January 2021, the Company received \$300.0 million as an upfront payment and is eligible to receive potential development, regulatory and commercial milestones of up to \$740.0 million.

The Company has evaluated the Takeda License Agreement in accordance with FASB Topic 606 - Revenue for Contracts from Customers, which became effective for the Company on October 1, 2018. 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 ARO-AAT 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. The Company will co-fund certain of the development and commercialization costs that Takeda manages, and these co-funding amounts will be recorded as Research and Development Expenses or General and Administrative Expenses, as appropriate.

The Company determined the initial transaction price totaled approximately \$300.0 million, which includes the upfront payment. The Company has excluded any future estimated milestones, royalties, or profit-sharing payments from this transaction price to date. The Company has allocated the total \$300.0 million initial transaction price to its one distinct performance obligation for the ARO-AAT license and the associated Takeda R&D Services. Revenue will be recognized using a proportional performance method (based on actual costs incurred versus total estimated costs incurred for the Takeda R&D Services). Revenue for the three months ended June 30, 2021 and 2020 was \$35.7 million and \$0, respectively. Revenue for the nine months ended June 30, 2021 and 2020 was \$69.3 million and \$0, respectively. As of June 30, 2021, there were \$0 in contract assets recorded as accounts receivable, \$150.9 million in contract liabilities recorded as deferred revenue and \$79.7 million in contract liabilities recorded as deferred revenue, net of the current portion.

Horizon Therapeutics Ireland DAC

On June 18, 2021, the Company entered into the Horizon License Agreement with Horizon. Under the Horizon License Agreement, Horizon has received a worldwide exclusive license for ARO-XDH, a previously undisclosed discovery-stage investigational RNAi therapeutic being developed by the Company as a potential treatment for people with uncontrolled gout. The Company will conduct all activities through the preclinical stages of development of ARO-XDH, and Horizon will be wholly responsible for clinical development and commercialization of ARO-XDH. In July 2021, the Company received \$40 million as an upfront payment and is eligible to receive up to \$660 million in potential development, regulatory and sales milestones. The Company is also eligible to receive royalties in the low- to mid-teens range on net product sales.

The Company has evaluated the Horizon License Agreement in accordance with FASB Topic 606 - Revenue for Contracts from Customers, which became effective for the Company on October 1, 2018. 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 ARO-XDH (the "Horizon R&D Services"). Due to the specialized and unique nature of these Horizon 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 Horizon R&D Services, which are the responsibility of the Company, Horizon will be responsible for managing future clinical development and commercialization of ARO-XDH.

The Company determined the initial transaction price totaled approximately \$40.0 million, which includes the upfront payment. The Company will exclude any future estimated milestones, royalties, or profit-sharing payments from this transaction price to date. The Company will allocate the total \$40.0 million initial transaction price to its one distinct performance obligation for the ARO-XDH license and the associated Horizon R&D Services. Revenue will be recognized using a proportional performance method. At June 30, 2021, no amounts were recorded on the Company's Consolidated Balance Sheets or Consolidated Statements of Operations and Comprehensive Income (Loss), as the Company has not performed any substantive Horizon R&D Services.

Operating Expenses

The analysis below details the operating expenses and discusses the expenditures of the Company within the major expense categories. Certain reclassifications have been made to prior-period operating expense categories to conform to the current period presentation. For purposes of comparison, the amounts for the three and nine months ended June 30, 2021 and 2020 are shown in the tables below.

Research and Development Expenses

R&D expenses are related to the Company's research and development efforts and related program 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 operations at our research facilities in Madison, Wisconsin and San Diego, California, including facility costs and laboratory-related expenses. Salaries and stock compensation expense consist of salary, bonuses, payroll taxes and related benefits and stock compensation for our R&D personnel. Depreciation and amortization expense relates to depreciation on lab equipment and leasehold improvements at our research facilities. We do not separately track R&D expenses by individual research and development projects, including 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 for research and development activities. The following table provides details of research and development expenses for the periods indicated:

(table below in thousands)

| | Three Months Ended | % of Expense Category | Three Months Ended | % of Expense Category | Increase (Decrease) | |
|--|--------------------|-----------------------|--------------------|-----------------------|---------------------|------------|
| | June 30, 2021 | | June 30, 2020 | | \$ | % |
| Salaries | \$ 8,518 | 14% | \$ 4,861 | 15% | \$ 3,657 | 75% |
| Facilities related | 1,306 | 2% | 1,209 | 4% | 97 | 8% |
| Candidate costs | 31,468 | 53% | 15,755 | 48% | 15,713 | 100% |
| R&D discovery costs | 10,082 | 17% | 4,070 | 13% | 6,012 | 148% |
| Total research and development expense, excluding non-cash expense | 51,374 | 87% | 25,895 | 80% | 25,479 | 98% |
| Stock compensation | 6,530 | 11% | 5,296 | 16% | 1,234 | 23% |
| Depreciation/amortization | 1,421 | 2% | 1,382 | 4% | 39 | 3% |
| Total research and development expense | \$ 59,325 | 100% | \$ 32,573 | 100% | \$ 26,752 | 82% |

| | Nine Months Ended | % of Expense Category | Nine Months Ended | % of Expense Category | Increase (Decrease) | |
|--|-------------------|-----------------------|-------------------|-----------------------|---------------------|------------|
| | June 30, 2021 | | June 30, 2020 | | \$ | % |
| Salaries | \$ 25,375 | 18% | \$ 13,173 | 15% | \$ 12,202 | 93% |
| Facilities related | 4,456 | 3% | 2,653 | 3% | 1,803 | 68% |
| Candidate costs | 67,152 | 48% | 44,901 | 53% | 22,251 | 50% |
| R&D discovery costs | 20,295 | 14% | 11,540 | 14% | 8,755 | 76% |
| Total research and development expense, excluding non-cash expense | \$ 117,278 | 84% | \$ 72,267 | 85% | \$ 45,011 | 62% |
| Stock compensation | 18,421 | 13% | 9,411 | 11% | 9,010 | 96% |
| Depreciation/amortization | 4,877 | 4% | 3,712 | 4% | 1,165 | 31% |
| Total research and development expense | \$ 140,576 | 100% | \$ 85,390 | 100% | \$ 55,186 | 65% |

Salaries expense increased by \$3,657,000 from \$4,861,000 during the three months ended June 30, 2020 to \$8,518,000 during the current period. Salaries expense increased by \$12,202,000 from \$13,173,000 during the nine months ended June 30, 2020 to \$25,375,000 during the current period. This increase is primarily due to an increase in R&D headcount that has occurred as the Company has expanded its pipeline of candidates. We anticipate this expense to continue to increase as we continue to expand our pipeline of candidates and increase headcount to support our discovery efforts to identify new drug candidates

Facilities expense increased by \$97,000 from \$1,209,000 during the three months ended June 30, 2020 to \$1,306,000 during the current period. Facilities expense increased by \$1,803,000 from \$2,653,000 during the nine months ended June 30, 2020 to \$4,456,000 during the current period. This category includes rental costs for our research and development facilities in Madison, Wisconsin and San Diego, California. This increase is primarily due to the commencement of our sublease in San Diego, California in April 2020 and the lease expansion at our Madison facility in May 2020.

Candidate costs increased by \$15,713,000 from \$15,755,000 during the three months ended June 30, 2020 to \$31,468,000 during the current period. Candidate costs increased by \$22,251,000 from \$44,901,000 during the nine months ended June 30, 2020 to \$67,152,000 during the current period. This increase is primarily due to the progression of our pipeline of candidates into and through clinical trials, which results in higher outsourced clinical trial, toxicity study and manufacturing costs. We anticipate these expenses to continue to increase as our pipeline of candidates grows and progresses to later phase clinical trials.

R&D discovery costs increased by \$6,012,000 from \$4,070,000 during the three months ended June 30, 2020 to \$10,082,000 in the current period. R&D discovery costs increased by \$8,755,000 from \$11,540,000 during the nine months ended June 30, 2020 to \$20,295,000 in the current period. This increase is primarily due to the growth of our discovery efforts, including the addition of our research facility in San Diego. We anticipate this expense to continue to increase as we increase headcount to support our discovery efforts to identify new drug candidates.

Stock compensation expense, a non-cash expense, increased by \$1,234,000 from \$5,296,000 during the three months ended June 30, 2020 to \$6,530,000 during the current period. Stock compensation expense, a non-cash expense, increased by \$9,010,000 from \$9,411,000 during the nine months ended June 30, 2020 to \$18,421,000 during the current period. Stock compensation expense is based upon the valuation of stock options and restricted stock units granted to employees, directors and certain consultants. Many variables affect the amount expensed, including the Company's stock price on the date of the grant, as well as other assumptions. The increase in the expense in the current period is primarily due to the increased headcount discussed above and a mix of higher grant date fair values of awards amortizing during the current period due to the Company's stock price at the time of the grants. We generally expect future stock compensation expense to increase as our headcount continues to increase to support our clinical pipeline.

Depreciation and amortization expense, a non-cash expense, increased by \$39,000 from \$1,382,000 during the three months ended June 30, 2020 to \$1,421,000 during the current period. Depreciation and amortization expense, a non-cash expense, increased by \$1,165,000 from \$3,712,000 during the nine months ended June 30, 2020 to \$4,877,000 during the current period. The majority of depreciation and amortization expense relates to depreciation on lab equipment and leasehold improvements at our Madison and San Diego research facilities.

General & Administrative Expenses

The following table provides details of our general and administrative expenses for the periods indicated:

(table below in thousands)

| | Three Months Ended | % of Expense Category | Three Months Ended | % of Expense Category | Increase (Decrease) | |
|--|--------------------|-----------------------|--------------------|-----------------------|---------------------|-------------|
| | June 30, 2021 | | June 30, 2020 | | \$ | % |
| Salaries | \$ 2,570 | 14% | \$ 2,633 | 25% | \$ (63) | -2% |
| Professional/outside services | 379 | 2% | 2,020 | 19% | (1,641) | -81% |
| Facilities related | 610 | 3% | 446 | 4% | 164 | 37% |
| Other G&A | 2,278 | 12% | 746 | 7% | 1,532 | 205% |
| Total general & administrative expense, excluding non-cash expense | 5,837 | 32% | 5,845 | 54% | (8) | 159% |
| Stock compensation | 12,020 | 65% | 4,750 | 44% | 7,270 | 153% |
| Depreciation/amortization | 577 | 3% | 154 | 1% | 423 | 275% |
| Total general & administrative expense | \$ 18,434 | 100% | \$ 10,749 | 100% | \$ 7,685 | 586% |

| | Nine Months Ended | % of Expense Category | Nine Months Ended | % of Expense Category | Increase (Decrease) | |
|--|-------------------|-----------------------|-------------------|-----------------------|---------------------|------|
| | June 30, 2021 | | June 30, 2020 | | \$ | % |
| Salaries | \$ 8,411 | 19% | \$ 9,747 | 26% | \$ (1,336) | -14% |
| Professional/outside services | 4,199 | 10% | 5,519 | 15% | (1,320) | -24% |
| Facilities related | 2,127 | 5% | 1,657 | 4% | 470 | 28% |
| Other G&A | 4,326 | 10% | 2,531 | 6% | 1,795 | 71% |
| Total general & administrative expense, excluding non-cash expense | \$ 19,063 | 44% | \$ 19,454 | 51% | \$ (391) | -2% |
| Stock compensation | 23,631 | 54% | 18,099 | 48% | 5,532 | 31% |
| Depreciation/amortization | 887 | 2% | 456 | 1% | 431 | 95% |
| Total general & administrative expense | \$ 43,581 | 100% | \$ 38,009 | 100% | \$ 5,572 | 15% |

Salaries expense decreased by \$63,000 from \$2,633,000 during the three months ended June 30, 2020 to \$2,570,000 during the current period. Salaries expense decreased by \$1,336,000 from \$9,747,000 during the nine months ended June 30, 2020 to \$8,411,000 during the current period. The decrease of \$1,336,000 during the nine months ended June 30, 2021 as compared to the nine months ended June 30, 2020 is primarily due to higher annual performance bonuses awarded in December 2019. We expect salaries expense to increase as our headcount continues to increase to support our expanding clinical pipeline.

Professional/outside services include legal, accounting, consulting, patent expenses, business insurance expenses and other outside services retained by the Company. Professional/outside services expense decreased by \$1,641,000 from \$2,020,000 during the three months ended June 30, 2020 to \$379,000 during the current period. Professional/outside services expense decreased by \$1,320,000 from \$5,519,000 during the nine months ended June 30, 2020 to \$4,199,000 during the current period. The decrease in professional/outside services expense is primarily related to the timing of certain patent-related expenses.

Facilities-related expense increased by \$164,000 from \$446,000 during the three months ended June 30, 2020 to \$610,000 during the current period. Facilities-related expense increased by \$470,000 from \$1,657,000 during the nine months ended June 30, 2020 to \$2,127,000 during the current period. This category primarily includes rental costs for our corporate headquarters in Pasadena, California. The increase in both periods was due to the additional space leased for our corporate headquarters to accommodate an increase in headcount.

Other G&A expense increased by \$1,532,000 from \$746,000 during the three months ended June 30, 2020 to \$2,278,000 during the current period. Other G&A expense increased by \$1,795,000 from \$2,531,000 during the nine months ended June 30, 2020 to \$4,326,000 during the current period. This category consists primarily of travel, communication and technology, office expenses, and franchise and property tax expenses. The increase is due to an increase in headcount at the Company's corporate headquarters.

Stock compensation expense, a non-cash expense, increased by \$7,270,000 from \$4,750,000 during the three months ended June 30, 2020 to \$12,020,000 during the current period. Stock compensation expense, a non-cash expense, increased by \$5,532,000 from \$18,099,000 during the nine months ended June 30, 2020 to \$23,631,000 during the current period. Stock compensation expense is based upon the valuation of stock options and restricted stock units granted to employees, directors and certain consultants. Many variables affect the amount expensed, including the Company's stock price on the date of the grant, as well as other assumptions. We generally expect future stock compensation expense to increase as our headcount continues to increase to support our clinical pipeline.

Depreciation and amortization expense, a noncash expense, increased by \$423,000 from \$154,000 during the three months ended June 30, 2020 to \$577,000 during the current period. Depreciation and amortization expense, a noncash expense, increased by \$431,000 from \$456,000 during the nine months ended June 30, 2020 to \$887,000 during the current period. The increase is primarily related to amortization of leasehold improvements for our corporate headquarters.

Other Income/Expense

Other income/expense was income of \$2,335,000 during the three months ended June 30, 2020 compared to income of \$1,944,000 during the current period. Other income/expense was income of \$6,920,000 during the nine months ended June 30, 2020 compared to income of \$6,679,000 during the current period. Other income is primarily related to interest income and realized and unrealized gain/loss on our marketable securities.

Liquidity and Capital Resources

Arrowhead has historically financed its operations through the sale of its equity securities and revenue from its collaboration agreements. Research and development activities have required significant capital investment since the Company's inception and are expected to continue to require significant cash expenditure in the future.

At June 30, 2021, the Company had cash on hand of approximately \$326.0 million as compared to \$143.6 million at September 30, 2020. Cash invested in short-term fixed income securities and marketable securities was \$190.3 million at June 30, 2021, compared to \$171.9 million at September 30, 2020. Cash invested in long-term fixed income securities was \$128.4 million at June 30, 2021, compared to \$137.5 million at September 30, 2020. The Company also entered into an Open Market Sale Agreement (the "ATM agreement") in August 2020, 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. As of June 30, 2021, no shares have been issued under the ATM agreement. The Company believes its current financial resources are sufficient to fund its operations through at least the next twelve months.

A summary of cash flows for the nine months ended June 30, 2021 and 2020 is as follows:

| | Nine Months Ended June 30, 2021 | Nine Months Ended June 30, 2020 |
|--|------------------------------------|------------------------------------|
| | (in thousands) | |
| Cash Flow from: | | |
| Operating Activities | 195,341 | (84,541) |
| Investing Activities | (23,433) | (174,883) |
| Financing Activities | 10,490 | 256,943 |
| Net Increase (decrease) in cash and cash equivalents | 182,398 | (2,481) |
| Cash and cash equivalents at beginning of period | 143,583 | 221,804 |
| Cash and cash equivalents at end of period | 325,981 | 219,323 |

During the nine months ended June 30, 2021, cash flow provided by operating activities was \$195.3 million, which was primarily due to the \$300 million payment received under the Takeda License Agreement and the \$10 million milestone payment from Janssen for ARO-JNJ1, partially offset by ongoing expenses of the Company's research and development programs and general and administrative expenses. Cash used in investing activities was \$23.4 million, which was primarily related to the purchase of property and equipment of \$15.4 million, partially offset by the net purchase of investments of \$8.1 million. Cash provided by financing activities of \$10.5 million was related to cash received from stock option exercises.

During the nine months ended June 30, 2020, the Company used \$84.5 million in cash from operating activities, which was primarily related to the ongoing expenses of the Company's research and development programs and general and administrative expenses. Cash used in investing activities was \$174.9 million, which was primarily related to the purchase of fixed-income investments of \$194.0 million and property and equipment of \$10.1 million, partially offset by the maturity of \$29.1 million of fixed-income securities. Cash provided by financing activities of \$256.9 million was driven by the Company's securities financing in December 2019, which generated \$250.5 million in net cash proceeds, as well as \$6.5 million in cash received from stock option exercises.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

There has been no material change in our exposure to market risk from that described in Item 7A of our Annual Report on Form 10-K for the year ended September 30, 2020.

ITEM 4. CONTROLS AND PROCEDURES

Our Chief Executive Officer and our Chief Financial Officer, after evaluating our “disclosure controls and procedures” (as defined in Rules 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934, as amended (the “Exchange Act”)) as of the end of the period covered by this Quarterly Report on Form 10-Q (the “Evaluation Date”), have concluded that, as of the Evaluation Date, our disclosure controls and procedures are effective to ensure that information we are required to disclose in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in SEC rules and forms, and to ensure that information required to be disclosed by us in such reports is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer where appropriate, to allow timely decisions regarding required disclosure.

No change in the Company’s internal controls over financial reporting (as defined in Rule 13a-15(f) and 15d-15(f) of the Exchange Act) occurred during the Company’s most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II—OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

From time to time, we may be involved in routine legal proceedings, as well as demands, claims and threatened litigation, which arise in the normal course of our business. Litigation can be expensive and disruptive to normal business operations. Moreover, the results of legal proceedings, particularly complex legal proceedings, cannot be predicted with any certainty. There have been no material developments in the legal proceedings that we disclosed in Part I, Item 3 of our Annual Report on Form 10-K for the year ended September 30, 2020.

ITEM 1A. Risk Factors

There have been no material changes to the risk factors included in our Annual Report on Form 10-K for the year ended September 30, 2020. Please carefully consider the information set forth in this Quarterly Report on Form 10-Q and the risk factors discussed in Part I, “Item 1A. Risk Factors” in our Annual Report on Form 10-K for the year ended September 30, 2020, which could materially affect our business, financial condition or future results. The risks described in our Annual Report on Form 10-K, as well as other risks and uncertainties, could materially and adversely affect our business, results of operations and financial condition, which in turn could materially and adversely affect the trading price of shares of our Common Stock. Additional risks not currently known or currently material to us may also harm our business.

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

None.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not Applicable.

ITEM 5. OTHER INFORMATION

None.

ITEM 6. EXHIBITS

| Exhibit Number | Document Description |
|-------------------|--|
| 10.1 | <u>Form of Performance RSU Agreement (Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan)*</u> |
| 10.2 | <u>Form of Stock Option Agreement (Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan)*</u> |
| 10.3 | <u>Form of RSU Agreement (Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan)*</u> |
| 10.4 | <u>Collaboration and License Agreement by and between Arrowhead Pharmaceuticals, Inc. and Horizon Therapeutics Ireland DAC, dated June 18, 2021*†</u> |
| 31.1 | <u>Certification of Chief Executive Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002*</u> |
| 31.2 | <u>Certification of Chief Financial Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002*</u> |
| 32.1 | <u>Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002**</u> |
| 32.2 | <u>Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002**</u> |
| 101.INS | Inline XBRL Instance Document |
| 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 this Quarterly Report on Form 10-Q, formatted in Inline XBRL (included as Exhibit 101)* |

* Filed herewith

** Furnished herewith

† Certain confidential portions of this exhibit were omitted by means of marking such portions with asterisks because the identified confidential portions (i) are not material and (ii) would be competitively harmful if publicly disclosed.

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this Quarterly Report on Form 10-Q to be signed on its behalf by the undersigned, thereunto duly authorized.

Dated: August 5, 2021

ARROWHEAD PHARMACEUTICALS, INC.

By: /s/ Kenneth A. Myszkowski
Kenneth A. Myszkowski
Chief Financial Officer
(Principal Financial Officer and Duly Authorized Officer)

| | |
|---|--|
| Name: | |
| Number of Restricted Stock Units subject to Award: | |
| Date of Grant: | |
| Vesting Schedule: | |
| Grant ID: | |

**ARROWHEAD PHARMACEUTICALS, INC.
2021 INCENTIVE PLAN**

PERFORMANCE RESTRICTED STOCK UNIT AGREEMENT

This agreement (this "Agreement") evidences an award (the "Award") consisting of, in aggregate, the number of restricted stock units set forth in the table above (the "Restricted Stock Units" or "RSUs") granted by Arrowhead Pharmaceuticals, Inc. (the "Company") to the individual named above (the "Grantee") pursuant to and subject to the terms of the Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan (as amended from time to time, the "Plan"), which is incorporated herein by reference.

1. Grant of Restricted Stock Units. The Company grants to the Grantee on the date set forth above (the "Date of Grant") an award consisting of the right to receive on the terms provided herein and in the Plan, one share of Stock with respect to each Restricted Stock Unit forming part of the Award, in each case, subject to adjustment pursuant to Section 7 of the Plan in respect of transactions occurring after the date hereof.

2. Meaning of Certain Terms. Except as otherwise defined herein, all capitalized terms used herein have the same meaning as in the Plan.

3. Vesting. Unless earlier terminated, forfeited, relinquished or expired, the Restricted Stock Units shall vest as follows: _____ of the total number of Award shares upon the achievement of each of the _____ performance criteria (each a "Vesting Performance Goal") set forth on Exhibit A attached hereto as determined in accordance with the terms of Exhibit A, but only if the Vesting Performance Goal is achieved during the applicable performance period on or before the applicable deadline specified on Exhibit A for such Vesting Performance Goal (the "Vesting Deadline"). In the event that the Grantee's employment with the Company terminates for any reason before the vesting date of all or any portion of the Award, as determined in accordance with Exhibit A, the then-unvested portion of the Award shall immediately terminate and be forfeited.

4. Delivery of Stock. The Company shall deliver to the Grantee as soon as practicable upon the vesting of the Restricted Stock Units or any portion thereof in accordance with the terms of Exhibit A, but in all events no later than thirty (30) days following the date on which such Restricted Stock Units vest, one share of Stock with respect to each such vested Restricted Stock Unit, subject to the terms of the Plan and this Agreement.

5. Dividends; Other Rights. The Award shall not be interpreted to bestow upon the Grantee any equity interest or ownership in the Company or any Affiliate prior to the date on which the Company delivers shares of Stock to the Grantee (if any). The Grantee is not entitled to vote any shares of Stock by reason of the granting of this Award or to receive or be credited with any dividends declared and payable on any share of Stock prior to the date on which any such share is delivered to the Grantee hereunder. The Grantee shall have the rights of a shareholder only as to those shares of Stock, if any, that are actually delivered under this Award.

6. Forfeiture; Recovery of Compensation.

(a) To the extent that Grantee does not vest in any Restricted Stock Units, all interest in such Restricted Stock Units shall be forfeited. Grantee has no right or interest in any Restricted Stock Units that are forfeited.

(b) The Administrator may cancel, rescind, withhold or otherwise limit or restrict the Award at any time if the Grantee is not in compliance with all applicable provisions of this Agreement and the Plan.

(c) By accepting the Award the Grantee expressly acknowledges and agrees that his or her rights (and those of any permitted transferee of the Award) under the Award to any Stock acquired under the Award or any proceeds from the disposition thereof, are subject to Section 6(a)(6) of the Plan (including any successor provision). Nothing in the preceding sentence shall be construed as limiting the general application of Section 11 of this Agreement.

7. Nontransferability. Neither the Award nor the Restricted Stock Units may be transferred except as expressly permitted under Section 6(a)(3) of the Plan.

8. Certain Tax Matters. The Grantee expressly acknowledges and agrees that the Grantee's rights hereunder, including the right to be issued shares of Stock upon the vesting of the Restricted Stock Units (or any portion thereof), are subject to the Grantee's promptly paying, or in respect of any later requirement of withholding being liable promptly to pay at such time as such withholdings are due, to the Company in cash (or by such other means as may be acceptable to the Administrator in its discretion) all taxes required to be withheld, if any. No shares of Stock will be transferred pursuant to the vesting of the Restricted Stock Units (or any portion thereof) unless and until the Grantee or the person then holding the Award has remitted to the Company an amount in cash sufficient to satisfy any federal, state, or local requirements with respect to tax withholdings then due and has committed (and by accepting this Award the Grantee shall be deemed to have committed) to pay in cash all tax withholdings required at any later time in respect of the transfer of such shares, or has made other arrangements satisfactory to the Administrator with respect to such taxes. The Grantee also authorizes the Company and its subsidiaries to withhold any required tax withholdings amount from any amounts otherwise owed to the Grantee, but nothing in this sentence shall be construed as relieving the Grantee of any liability for satisfying his or her obligations under the preceding provisions of this Section.

9. Net Settlement. With the written consent of the Company and approval by the Administrator, the payment of the Grantee's tax withholding obligations may be made via "net settlement", whereby the Grantee elects to satisfy all applicable tax withholding requirements via issuance from Company to the Grantee an amount of shares consisting of the number of shares vested less shares withheld to cover the tax withholding obligations ("the withheld shares"). In this case, the Company will remit to the appropriate taxing authorities withheld taxes on behalf of the Grantee in an amount equal to the value of the withheld shares. The number of withheld shares will be calculated by valuing the withheld shares based upon the closing price on the applicable vesting date. Net settlement resulting in partial shares will be rounded up. Tax withholding due related to federal and state income taxes will be made at minimum withholding requirements.

10. Effect on Employment. Neither the grant of the Award, nor the issuance of Shares upon vesting of the Award, will give the Grantee any right to be retained in the employ or service of the Company or any of its Affiliates, affect the right of the Company or any of its Affiliates to discharge or discipline such Grantee at any time, or affect any right of such Grantee to terminate his or her Employment at any time.

11. Provisions of the Plan. A copy of the Plan as in effect on the Date of Grant has been furnished to the Grantee. By accepting the Award, the Grantee agrees to be bound by the terms of the Plan and this Agreement. In the event of any conflict between the terms of this Agreement and the Plan, the terms of the Plan shall control.

12. Acknowledgments. The Grantee acknowledges and agrees that (a) this Agreement may be executed in two or more counterparts, each of which shall be an original and all of which together shall constitute one and the same instrument, (b) this agreement may be executed and exchanged using facsimile, portable document format (PDF) or electronic signature, which, in each case, shall constitute an original signature for all purposes hereunder and (c) such signature by the Company will be binding against the Company and will create a legally binding agreement when this Agreement is countersigned by the Grantee.

13. Electronic Delivery and Acceptance. The Company may, in its sole discretion, decide to deliver any documents related to the Award and participation in the Plan or future Awards that may be granted under the Plan by electronic means or to request the Grantee's consent to participate in the Plan by electronic means. The Grantee hereby consents to receive such documents by electronic delivery and, if requested, agrees to accept this Award and participate in the Plan through an online or electronic system established and maintained by the Company or a third party designated by the Company.

[The remainder of this page is intentionally left blank.]

IN WITNESS WHEREOF, the Company has caused this Agreement to be executed by its duly authorized officer.

ARROWHEAD PHARMACEUTICALS, INC.

By: _____
Name: _____
Title: _____

Date: _____

Acknowledged and Agreed:

Name (Print): _____

Date: _____

[Signature Page to Performance Restricted Stock Unit Agreement]

Exhibit A

The number of Restricted Stock Units earned and vested, if any, will be determined based upon the Compensation Committee's determination, in its sole discretion, of the achievement of one or more of the Vesting Performance Goals set forth below:

| Vesting Performance Goal | Number of Shares to vest upon achievement of Vesting Performance Goal | Date of commencement of performance period | Vesting Deadline (end of performance period) |
|--------------------------|---|--|--|
| | | | |
| | | | |
| | | | |

The vesting will be certified by the Compensation Committee as soon as practicable following its determination. The date of such certification shall be the vesting date for the portion of the Award that becomes vested as a result of such certification. Notwithstanding the foregoing, the date of such certification and vesting date for any Vesting Performance Goal shall not occur before _____, 202_.

In the event that one or more of the Vesting Performance Goals is not achieved (as determined by the Compensation Committee in its sole discretion) on or before the applicable Vesting Deadline, that portion of the Award shall be deemed terminated and forfeited as of such Vesting Deadline.

For the avoidance of doubt, the Compensation Committee must certify the achievement of any Vesting Performance Goal and the resulting number of earned and vested Restricted Stock Units prior to the vesting and settlement of any portion of the Award.

**STOCK OPTION GRANT
2021 INCENTIVE PLAN
NOTICE OF GRANT
(PART I OF THE STOCK OPTION AWARD AGREEMENT)**

To: _____ (“**Optionee**”)

From: Arrowhead Pharmaceuticals, Inc.

We are pleased to inform you that you have been approved for a grant of an option (your “**Option**”) to purchase shares of Arrowhead Pharmaceuticals, Inc.’s common stock.

Your Option will be governed by the Company’s 2021 Incentive Plan (the “**Plan**”), as currently in effect and as may be amended hereafter from time to time, the attached Stock Option Award Agreement (the “**Option Agreement**”) and the following specific provisions (which are subject to adjustment under the Plan and the Option Agreement):

The “**Date of Grant**” for your Option is:

The “**Expiration Date**” of your Option is:

The “**Number of Shares**” covered by your Option is:

The “**Exercise Price**” per share for your Option is:

The “**Commencement Date**” of your Option is:

Vesting: As long as you remain an employee of the Company, your Option will vest and become exercisable with respect to _____ of the Number of Shares one year from the Commencement Date and then in _____ equal monthly installments thereafter. Your Option cannot be exercised except to the extent vested; if all other terms and conditions are satisfied, your Option will be fully vested and exercisable as of the fourth anniversary of the Commencement Date. Of course, you can never exercise the Option for more than the Number of Shares or after the Expiration Date (in each case as adjusted under the terms of the Plan and the Option Agreement). This Option is a non-statutory Stock Option under the U.S. Internal Revenue Code of 1986, as amended.

Electronic Acceptance: The Option is contingent upon your agreement to the provisions of this Notice of Grant and the terms and conditions of the Plan and the Option Agreement, which are hereby delivered via the online Document Library of the Company’s stock option administration portal (the “**Portal**”). Your electronic acceptance of the grant in the Portal constitutes your agreement to these terms and conditions as binding as a manual signature. Your electronic acceptance also signifies your consent to be governed by the terms and conditions of use of the Portal, also made available in the Document Library. Provisions of the Plan, the Option Agreement and this Notice of Grant and the terms of use of the Portal are subject to adjustment. Paper copies of any of these documents can be requested from the Plan Administrator.

Grant Number:

ARROWHEAD PHARMACEUTICALS, INC.

STOCK OPTION AWARD AGREEMENT

Unless otherwise defined herein, the terms defined in the Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan (the “Plan”) shall have the same defined meanings in this Stock Option Award Agreement (the “Option Agreement”).

AGREEMENT

A. Grant of Option.

(i) Arrowhead Pharmaceuticals, Inc. (the “Company”) hereby grants to the optionee named in the Notice of Grant attached as Part I of this Option Agreement (the “Optionee”), on the date of grant set forth in the Notice of Grant, an option (the “Option”) to purchase the number of shares of the Company’s common stock (“Shares”), as set forth in the Notice of Grant, at the exercise price per Share set forth in the Notice of Grant (the “Exercise Price”), subject to the terms and conditions of the Plan, as currently in effect and as may be amended hereafter from time to time, the terms of which are incorporated herein by reference. In the event of a conflict between the terms and conditions of the Plan and the terms and conditions of this Option Agreement, the terms and conditions of the Plan shall prevail.

(ii) This Option shall be treated as a non-statutory Stock Option (“NSO”) under Section 422 of the U.S. Internal Revenue Code of 1986, as amended.

B. Exercise of Option.

(i) Right to Exercise. This Option is exercisable during its term in accordance with the vesting schedule set out in the Notice of Grant and the applicable provisions of the Plan and this Option Agreement.

(ii) Exercise Period. In no event shall this Option be exercised later than the Expiration Date set forth in the Notice of Grant. Specifically, any vested portion of this Option may be exercised after a termination of Employment, but not later than the Expiration Date set forth in the Notice of Grant.

(iii) Method of Exercise. This Option is exercisable by delivery of an exercise notice, in the form attached as Exhibit A (the “Exercise Notice”), which shall state the election to exercise the Option, the number of Shares in respect of which the Option is being exercised (the “Exercised Shares”), and such other representations and agreements as may be required by the Company pursuant to the provisions of the Plan. The Exercise Notice shall be completed by the Optionee and delivered to the Secretary of the Company. The Exercise Notice shall be accompanied by payment of the aggregate Exercise Price as to all Exercised Shares. This Option shall be deemed to be exercised with respect to the Exercised Shares upon receipt by the Company of such fully executed Exercise Notice accompanied by such aggregate Exercise Price.

(iv) Compliance with Applicable Laws. No Shares shall be issued pursuant to the exercise of this Option unless such issuance and exercise complies with applicable laws. Assuming such compliance, for income tax purposes the Exercised Shares shall be considered transferred to the Optionee on the date the Option is exercised with respect to such Exercised Shares.

C. Method of Payment.

Payment of the aggregate Exercise Price shall be by any of the following, or a combination thereof, at the election of the Optionee:

1. Cash; or
2. Check; or

3. Consideration received by the Company under a cashless exercise program implemented by the Company in connection with the Plan; or

4. Surrender of other Shares which (i) in the case of Shares acquired upon exercise of an option, have been owned by the Optionee for more than six (6) months on the date of surrender, **and** (ii) have a Fair Market Value on the date of surrender equal to the aggregate Exercise Price of the Exercised Shares.

D. Non-Transferability of Option. This Option may not be transferred in any manner other than by will or by the laws of descent or distribution and may be exercised during the lifetime of Optionee only by the Optionee. The terms of the Plan and this Option Agreement shall be binding upon the executors, administrators, heirs, successors and assigns of the Optionee.

E. Term of Option. This Option may be exercised only within the term set out in the Notice of Grant, and may be exercised during such term only in accordance with the Plan and the terms of this Option Agreement.

F. Tax Consequences. Some of the federal tax consequences relating to this Option, as of the date of this Option, are set forth below. THIS SUMMARY IS NECESSARILY INCOMPLETE, AND THE TAX LAWS AND REGULATIONS ARE SUBJECT TO CHANGE. THE OPTIONEE SHOULD CONSULT A TAX ADVISER BEFORE EXERCISING THIS OPTION OR DISPOSING OF THE SHARES.

(i) Exercise of Option. The Optionee may incur regular federal income tax liability upon exercise of an NSO. The Optionee will be treated as having received compensation income (taxable at ordinary income tax rates) equal to the excess, if any, of the Fair Market Value of the Exercised Shares on the date of exercise over their aggregate Exercise Price. If the Optionee is an Employee or a former Employee, the Company will be required to withhold from his or her compensation or collect from Optionee and pay to the applicable taxing authorities an amount in cash equal to a percentage of this compensation income at the time of exercise, and may refuse to honor the exercise and refuse to deliver Shares if such withholding amounts are not delivered at the time of exercise. This Option does not qualify as an incentive stock option under Section 422 of the U.S. Internal Revenue Code of 1986, as amended.

(ii) Disposition of Shares. If the Optionee holds NSO Shares for at least one year, any gain realized on disposition of the Shares will be treated as long-term capital gain for federal income tax purposes.

G. Entire Agreement: Governing Law. The Plan is incorporated herein by reference. The Plan, this Option Agreement and the Notice of Grant constitute the entire agreement of the parties with respect to the subject matter hereof and supersede in their entirety all prior undertakings and agreements of the Company and Optionee with respect to the subject matter hereof. This agreement is governed by the internal substantive laws but not the choice of law rules of California.

H. Forfeiture; Recovery of Compensation. By accepting this Option the Optionee expressly acknowledges and agrees that his or her rights (and those of any permitted transferee) under this Option or to any Shares acquired under this Option or any proceeds from the disposition thereof are subject to Section 6(a)(6) of the Plan (including any successor provision).

I. NO GUARANTEE OF CONTINUED SERVICE. OPTIONEE ACKNOWLEDGES AND AGREES THAT THE VESTING OF SHARES PURSUANT TO THE VESTING SCHEDULE HEREOF IS EARNED ONLY BY CONTINUING AS A SERVICE PROVIDER AT THE WILL OF THE COMPANY (AND NOT THROUGH THE ACT OF BEING HIRED, BEING GRANTED AN OPTION OR PURCHASING SHARES HEREUNDER). OPTIONEE FURTHER ACKNOWLEDGES AND AGREES THAT THIS AGREEMENT, THE TRANSACTIONS CONTEMPLATED HEREUNDER AND THE VESTING SCHEDULE SET FORTH HEREIN DO NOT CONSTITUTE AN EXPRESS OR IMPLIED PROMISE OF CONTINUED ENGAGEMENT AS A SERVICE PROVIDER FOR THE VESTING PERIOD, FOR ANY PERIOD, OR AT ALL, AND SHALL NOT INTERFERE WITH OPTIONEE'S RIGHT OR THE COMPANY'S RIGHT TO TERMINATE OPTIONEE'S RELATIONSHIP AS A SERVICE PROVIDER AT ANY TIME, WITH OR WITHOUT CAUSE.

J. Electronic Delivery and Acceptance. The Company may, in its sole discretion, decide to deliver any documents related to this Award or future Awards by electronic means or to request the Optionee's consent to participate in the Plan by electronic means. The Optionee hereby consents to receive such documents by electronic delivery and, if requested, agrees to accept this Award and participate in the Plan through an online or electronic system established and maintained by the Company or a third party designated by the Company.

Optionee has reviewed the Plan, this Option Agreement and the Notice of Grant in their entirety, has had an opportunity to obtain the advice of counsel prior to executing this Option Agreement and fully understands all provisions of the Plan, this Option Agreement and the Notice of Grant. Optionee hereby agrees to accept as binding, conclusive and final all decisions or interpretations of the Compensation Committee upon any questions relating to the Plan, this Option Agreement and the Notice of Grant. Optionee further agrees to notify the Company upon any change in the residence address indicated in this Option Agreement.

ARROWHEAD PHARMACEUTICALS, INC.

By: _____
Name: _____
Title: _____

Date: _____

Accepted by:

Name (Print): _____

Date: _____

EXHIBIT A

**ARROWHEAD PHARMACEUTICALS, INC.
2021 INCENTIVE PLAN
EXERCISE NOTICE**

Arrowhead Pharmaceuticals, Inc.
177 East Colorado Boulevard, Suite 700
Pasadena, California 91105
Attention: Secretary

1. Exercise of Option. Effective as of today, _____, _____ the undersigned (“Purchaser”) hereby elects to purchase _____ shares (the “Shares”) of the common stock of Arrowhead Pharmaceuticals, Inc. (the “Company”) under the Stock Option Agreement dated _____, ____ (the “Option Agreement”). The purchase price for the Shares shall be \$_____, as required by the Option Agreement. Capitalized terms not otherwise defined herein shall have the meaning ascribed to such terms in the Option Agreement.

2. Delivery of Payment. Purchaser herewith delivers to the Company the full purchase price for the Shares.

3. Representations of Purchaser. Purchaser acknowledges that Purchaser has received and read and understands the Plan and the Option Agreement and agrees to abide by and be bound by their terms and conditions.

4. Rights as Shareholder. Until the issuance (as evidenced by the appropriate entry on the books of the Company or of a duly authorized transfer agent of the Company) of the Shares, no right to vote or receive dividends or any other rights as a shareholder shall exist with respect to the optioned Stock, notwithstanding the exercise of the Option. The Shares so acquired shall be issued to the Optionee as soon as practicable after exercise of the Option. No adjustment will be made for a dividend or other right for which the record date is prior to the date of issuance, except as provided in Section 7 of the Plan.

5. Tax Consultation. Purchaser understands that Purchaser may suffer adverse tax consequences as a result of Purchaser’s purchase or disposition of the Shares. Purchaser represents that Purchaser has consulted with any tax consultants Purchaser deems advisable in connection with the purchase or disposition of the Shares and that Purchaser is not relying on the Company for any tax advice.

6. Entire Agreement: Governing Law. The Plan, the Option Agreement and the Notice of Grant are incorporated herein by reference. This Exercise Notice, the Plan, the Option Agreement and the Notice of Grant constitute the entire agreement of the parties with respect to the subject matter hereof and supersede in their entirety all prior undertakings and agreements of the Company and Purchaser with respect to the subject matter hereof. This agreement is governed by the internal substantive laws, but not the choice of law rules, of California.

Submitted by:
PURCHASER

Accepted by:
ARROWHEAD PHARMACEUTICALS, INC.

Signature

By

Print Name

Title

Date Received

Date Received

Address:

Address:

177 East Colorado Blvd, Suite 700
Pasadena, CA 91105

| | |
|--|--|
| Name: | |
| Number of Restricted Stock Units subject to Award: | |
| Date of Grant: | |
| Vesting Schedule: | |
| Grant ID: | |

ARROWHEAD PHARMACEUTICALS, INC.
2021 INCENTIVE PLAN

RESTRICTED STOCK UNIT AGREEMENT

This agreement (this "Agreement") evidences an award (the "Award") consisting of, in aggregate, the number of restricted stock units set forth in the table above (the "Restricted Stock Units" or "RSUs") granted by Arrowhead Pharmaceuticals, Inc. (the "Company") to the individual named above (the "Grantee") pursuant to and subject to the terms of the Arrowhead Pharmaceuticals, Inc. 2021 Incentive Plan (as amended from time to time, the "Plan"), which is incorporated herein by reference.

1. Grant of Restricted Stock Units. The Company grants to the Grantee on the date set forth above (the "Date of Grant") an award consisting of the right to receive on the terms provided herein and in the Plan, one share of Stock with respect to each Restricted Stock Unit forming part of the Award, in each case, subject to adjustment pursuant to Section 7 of the Plan in respect of transactions occurring after the date hereof.

2. Meaning of Certain Terms. Except as otherwise defined herein, all capitalized terms used herein have the same meaning as in the Plan.

3. Vesting. Unless earlier terminated, forfeited, relinquished or expired, the Restricted Stock Units shall vest in accordance with the schedule set forth in the table above.

4. Delivery of Stock. The Company shall deliver to the Grantee as soon as practicable upon the vesting of the Restricted Stock Units or any portion thereof, but in all events no later than thirty (30) days following the date on which such Restricted Stock Units vest, one share of Stock with respect to each such vested Restricted Stock Unit, subject to the terms of the Plan and this Agreement.

5. Dividends; Other Rights. The Award shall not be interpreted to bestow upon the Grantee any equity interest or ownership in the Company or any Affiliate prior to the date on which the Company delivers shares of Stock to the Grantee (if any). The Grantee is not entitled to vote any shares of Stock by reason of the granting of this Award or to receive or be credited with any dividends declared and payable on any share of Stock prior to the date on which any such share is delivered to the Grantee hereunder. The Grantee shall have the rights of a shareholder only as to those shares of Stock, if any, that are actually delivered under this Award.

6. Forfeiture; Recovery of Compensation.

(a) To the extent that Grantee does not vest in any Restricted Stock Units, all interest in such Restricted Stock Units shall be forfeited. Grantee has no right or interest in any Restricted Stock Units that are forfeited.

(b) The Administrator may cancel, rescind, withhold or otherwise limit or restrict the Award at any time if the Grantee is not in compliance with all applicable provisions of this Agreement and the Plan.

(c) By accepting the Award the Grantee expressly acknowledges and agrees that his or her rights (and those of any permitted transferee of the Award) under the Award to any Stock acquired under the Award or any proceeds from the disposition thereof, are subject to Section 6(a)(6) of the Plan (including any successor provision). Nothing in the preceding sentence shall be construed as limiting the general application of Section 11 of this Agreement.

7. Nontransferability. Neither the Award nor the Restricted Stock Units may be transferred except as expressly permitted under Section 6(a)(3) of the Plan.

8. Certain Tax Matters. The Grantee expressly acknowledges and agrees that the Grantee's rights hereunder, including the right to be issued shares of Stock upon the vesting of the Restricted Stock Units (or any portion thereof), are subject to the Grantee's promptly paying, or in respect of any later requirement of withholding being liable promptly to pay at such time as such withholdings are due, to the Company in cash (or by such other means as may be acceptable to the Administrator in its discretion) all taxes required to be withheld, if any. No shares of Stock will be transferred pursuant to the vesting of the Restricted Stock Units (or any portion thereof) unless and until the Grantee or the person then holding the Award has remitted to the Company an amount in cash sufficient to satisfy any federal, state, or local requirements with respect to tax withholdings then due and has committed (and by accepting this Award the Grantee shall be deemed to have committed) to pay in cash all tax withholdings required at any later time in respect of the transfer of such shares, or has made other arrangements satisfactory to the Administrator with respect to such taxes. The Grantee also authorizes the Company and its subsidiaries to withhold any required tax withholdings amount from any amounts otherwise owed to the Grantee, but nothing in this sentence shall be construed as relieving the Grantee of any liability for satisfying his or her obligations under the preceding provisions of this Section.

9. Net Settlement. With the written consent of the Company and approval by the Administrator, the payment of the Grantee's tax withholding obligations may be made via "net settlement", whereby the Grantee elects to satisfy all applicable tax withholding requirements via issuance from Company to the Grantee an amount of shares consisting of the number of shares vested less shares withheld to cover the tax withholding obligations ("the withheld shares"). In this case, the Company will remit to the appropriate taxing authorities withheld taxes on behalf of the Grantee in an amount equal to the value of the withheld shares. The number of withheld shares will be calculated by valuing the withheld shares based upon the closing price on the applicable vesting date. Net settlement resulting in partial shares will be rounded up. Tax withholding due related to federal and state income taxes will be made at minimum withholding requirements.

10. Effect on Employment. Neither the grant of the Award, nor the issuance of Shares upon vesting of the Award, will give the Grantee any right to be retained in the employ or service of the Company or any of its Affiliates, affect the right of the Company or any of its Affiliates to discharge or discipline such Grantee at any time, or affect any right of such Grantee to terminate his or her Employment at any time.

11. Provisions of the Plan. A copy of the Plan as in effect on the Date of Grant has been furnished to the Grantee. By accepting the Award, the Grantee agrees to be bound by the terms of the Plan and this Agreement. In the event of any conflict between the terms of this Agreement and the Plan, the terms of the Plan shall control.

12. Acknowledgments. The Grantee acknowledges and agrees that (a) this Agreement may be executed in two or more counterparts, each of which shall be an original and all of which together shall constitute one and the same instrument, (b) this agreement may be executed and exchanged using facsimile, portable document format (PDF) or electronic signature, which, in each case, shall constitute an original signature for all purposes hereunder and (c) such signature by the Company will be binding against the Company and will create a legally binding agreement when this Agreement is countersigned by the Grantee.

13. Electronic Delivery and Acceptance. The Company may, in its sole discretion, decide to deliver any documents related to the Award and participation in the Plan or future Awards that may be granted under the Plan by electronic means or to request the Grantee's consent to participate in the Plan by electronic means. The Grantee hereby consents to receive such documents by electronic delivery and, if requested, agrees to accept this Award and participate in the Plan through an online or electronic system established and maintained by the Company or a third party designated by the Company.

[The remainder of this page is intentionally left blank.]

IN WITNESS WHEREOF, the Company has caused this Agreement to be executed by its duly authorized officer.

ARROWHEAD PHARMACEUTICALS, INC.

By: _____
Name:
Title:

Date: _____

Acknowledged and Agreed:

Name (Print): _____

Date: _____

[Signature Page to Restricted Stock Unit Agreement]

[***] = CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY BRACKETS, HAS BEEN OMITTED BECAUSE THE INFORMATION (I) IS NOT MATERIAL AND (II) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

COLLABORATION AND LICENSE AGREEMENT

This **COLLABORATION AND LICENSE AGREEMENT** (the “**Agreement**”) is entered into as of June 18, 2021 (the “**Effective Date**”) by and between **HORIZON THERAPEUTICS IRELAND DAC**, a company formed under the laws of Ireland (“**Horizon**”), and **ARROWHEAD PHARMACEUTICALS, INC.**, a Delaware corporation (“**Arrowhead**”). Arrowhead and Horizon are sometimes referred to herein individually as a “**Party**” and collectively as the “**Parties**”.

RECITALS

WHEREAS, Arrowhead possesses proprietary technology and know-how related to the discovery, identification, synthesis and development of RNA interference (“**RNAi**”) therapeutics, using an N-acetyl-galactosamine (GalNAc) liver targeting approach;

WHEREAS, Horizon possesses resources and expertise in the development and commercialization of pharmaceutical products for diagnostic, therapeutic or prophylactic uses, and is interested in developing RNAi therapeutics as drug candidates;

WHEREAS, Horizon and Arrowhead desire to collaborate on a program for discovery and preclinical research of drug candidates aimed at inhibiting the expression of xanthine dehydrogenase (XDH) in the liver, and Horizon will obtain a worldwide exclusive license from Arrowhead to further develop, manufacture and commercialize products incorporating such drug candidates for all uses, all under the terms and conditions set forth below.

NOW, THEREFORE, in consideration of the foregoing premises and the mutual covenants and conditions contained in this Agreement, the Parties agree as follows:

ARTICLE 1 DEFINITIONS

1.1 “**Acquiror**” has the meaning set forth in Section 15.6(a).

1.2 “**Affiliate**” means, with respect to a particular Party, a person, corporation, partnership, or other entity that controls, is controlled by or is under common control with such Party. For the purposes of this definition, the word “control” (including, with correlative meaning, the terms “controlled by” or “under common control with”) shall mean the actual power, either directly or indirectly through one or more intermediaries, to direct or cause the direction of the management and policies of such entity, whether by the ownership of fifty percent (50%) or more of the voting stock of such entity, or by contract or otherwise.

1.3 “**Alliance Manager**” has the meaning set forth in Section 2.2.

1.4 “[***]” means those entities set forth in Exhibit G.

1.5 “**Arrowhead Indemnitees**” has the meaning set forth in Section 11.2.

1.6 “**Arrowhead Know-How**” means all Information (a) that is (i) Controlled by Arrowhead or any of its Affiliates as of the Effective Date or at any time during the Research Period, and (ii) necessary or reasonably useful for the Development, Manufacturing, Commercialization, use, sale, offer for sale, importation or other exploitation of any Compound or Product in the Field, or (b) that is (i) Controlled by Arrowhead or any of its Affiliates at any time after the Research Period and during the Term, and (ii) necessary for the Development, Manufacturing, Commercialization, use, sale, offer for sale, importation or other exploitation of any Compound or Product in the Field, and in any event including Arrowhead’s rights in any Program IP. For clarity, “Arrowhead Know-How” shall not include any trade secret specifically relating to [***] that is not disclosed by Arrowhead to Horizon.

1.7 “**Arrowhead Licensed Technology**” means the Arrowhead Know-How and Arrowhead Patents.

1.8 “**Arrowhead Patent**” means any Patent (a) Controlled by Arrowhead or any of its Affiliates as of the Effective Date or at any time during the Term, and (b) that is necessary or reasonably useful for, in either case, the Development, Manufacture, Commercialization, use, sale, offer for sale, importation or other exploitation of any Compound or Product in the Field, including (i) any Patent that claims or covers any Compound or Product (including the nucleotide sequences of any Compound or Product) or the Manufacture or use thereof, and (ii) Arrowhead’s rights in any Program Patents.

1.9 “**Arrowhead Platform Patents**” has the meaning set forth in Section 9.3(b)(ii)(1).

1.10 “**Arrowhead Third Party Agreement**” has the meaning set forth in Section 3.5(b).

1.11 “**Background IP**” has the meaning set forth in Section 9.1(a).

1.12 “**Background Patent**” has the meaning set forth in Section 9.1(a).

1.13 “**Bankruptcy Code**” means Title 11, U.S. Code Sections 101 et. seq.

1.14 “**Business Day**” means any weekday that is not a legal holiday in New York, New York, U.S., and is not a day on which banking institutions are required by Law to be closed.

1.15 “**Calendar Quarter**” means the respective periods of three (3) consecutive calendar months ending on March 31, June 30, September 30 and December 31; provided, however, that (a) the first Calendar Quarter of any particular period shall extend from the commencement of such period to the end of the first complete Calendar Quarter thereafter; and (b) the last Calendar Quarter shall end upon the expiration or termination of this Agreement.

1.16 “**Calendar Year**” means (a) for the first Calendar Year of the Term, the period beginning on the Effective Date and ending on December 31, 2021, (b) for each Calendar Year of the Term thereafter, each successive period beginning on January 1 and ending twelve (12) consecutive calendar months later on December 31, and (c) for the last Calendar Year of the Term, the period beginning on January 1 of the Calendar Year in which the Agreement expires or terminates and ending on the effective date of expiration or termination of this Agreement.

1.17 “**Change of Control**” means the occurrence of any of the following: (a) a Party enters into a merger, consolidation, business combination, recapitalization, share exchange, stock sale or sale or transfer of all or substantially all of its assets to which this Agreement relates, or other similar transaction or series of transactions with a Third Party; or (b) any transaction or series of related transactions in which any Third Party or group of Third Parties acquires beneficial ownership of securities of a Party representing more than fifty percent (50%) of the combined voting power of the then outstanding securities of such Party. Notwithstanding the foregoing clauses (a) or (b), a stock sale to underwriters of a public offering of a Party’s capital stock or other Third Parties solely for the purpose of financing or a transaction solely to change the domicile of a Party shall not constitute a Change of Control.

1.18 “**Claims**” has the meaning set forth in Section 11.1.

1.19 “**Clinical Trial**” means any human clinical trial of a Product as defined in 21 C.F.R. § 312.21, or an equivalent human clinical trial prescribed by the Regulatory Authorities in a foreign country.

1.20 “**CMC**” means chemistry, manufacture and controls.

1.21 “**Code**” means the Internal Revenue Code of 1986, as amended.

1.22 “**Collaboration Target**” means the gene or gene product that will be the potential site of inhibition or modulation by a therapeutic agent as listed in in **Exhibit A**.

1.23 “**Combination Product**” means a Product sold in combination with at least one (1) active pharmaceutical ingredient other than a Compound.

1.24 “**Commercialization**” means all activities undertaken before and after obtaining Regulatory Approval relating specifically to the pre-launch, launch, promotion, detailing, medical education and medical liaison activities, marketing, pricing, reimbursement, sale, import, export and distribution of Products in the Field in the Territory, including strategic marketing, sales force detailing, advertising, all customer support, Product distribution and invoicing and sales activities, including any Clinical Trials conducted after Regulatory Approval for a Product. “**Commercialize**” has a correlative meaning.

1.25 “**Commercially Reasonable Efforts**” means efforts consistent with the efforts and resources normally used by a similarly situated pharmaceutical or biotechnology company in the exercise of its reasonable business discretion relating to the development or commercialization of a pharmaceutical product with similar product characteristics that is of similar market potential at a similar stage of development or commercialization, and taking into account other relevant factors

including technical, legal, intellectual property, competition, scientific and medical factors, intellectual property coverage, safety and efficacy, applicable Law, stage of development, product profile, competitiveness of the marketplace, supply chain, proprietary position, regulatory exclusivity, anticipated or approved labeling, present and future market and commercial potential, the likelihood of receipt of Regulatory Approval, profitability (including pricing and reimbursement status achieved or likely to be achieved), alternative products and legal issues, based on conditions then prevailing. Commercially Reasonable Efforts shall be determined on a country-by-country and product-by-product basis, and it is anticipated that the level of effort will change over time, reflecting changes in the stage of development of the Compounds or Products.

1.26 “**Competing Product**” means any molecule [***], or any product containing or comprising such a molecule.

1.27 “**Competing Program**” means the research, development, commercialization or manufacture, in the Territory, of any Competing Product.

1.28 “**Completion**” means, with respect to a Clinical Trial, the locking of the database that contains the data collected from such Clinical Trial in a manner consistent with industry standards to enable data analysis and reporting.

1.29 “**Compound**” means (a) any RNAi Molecule designed to inhibit or modulate the expression of the Collaboration Target that is generated or developed (i) by or on behalf of Arrowhead before the Effective Date or during the Term in the performance of activities under this Agreement, or (ii) by a Party or the Parties in the performance of the Research Program, or (b) any derivative or modification of such RNAi Molecule in clause (a).

1.30 “**Confidentiality Agreement**” means the Mutual Confidentiality Agreement between Arrowhead and Horizon Therapeutics plc, dated as of November 30, 2020.

1.31 “**Confidential Information**” of a Party means any and all Information that is disclosed by or on behalf a Party to the other Party or its Affiliates pursuant to this Agreement, whether in oral, written, graphic, or electronic form. All Information disclosed by or on behalf of a Party or its Affiliate pursuant to the Confidentiality Agreement shall be deemed to be such Party’s Confidential Information, with the mutual understanding and agreement that any use or disclosure thereof that is authorized under Article 12 shall not be restricted by or be deemed a violation of the Confidentiality Agreement. Notwithstanding anything contained herein to the contrary, (a) all Horizon Sole Program IP shall be deemed to be the Confidential Information of Horizon, where Horizon shall be deemed to be the disclosing Party and Arrowhead shall be deemed to be the receiving Party with respect thereto; (b) all Arrowhead Sole Program IP shall be deemed to be the Confidential Information of Arrowhead, where Arrowhead shall be deemed to be the disclosing Party and Horizon shall be deemed to be the receiving Party with respect thereto; and (c) all Joint Program IP, and the terms of this Agreement, shall be deemed to be the Confidential Information of both Parties, and both Parties shall be deemed to be the receiving Party with respect thereto.

1.32 “**Control**” means, subject to Section 3.5, with respect to any Information or intellectual property right, that an entity (a) owns or (b) has the right to grant access, a license, or

a sublicense (as applicable, other than by virtue of the rights granted in this Agreement) to such Information or intellectual property right on the terms and conditions set forth in this Agreement without violating the terms of any then-existing agreement with any Third Party.

1.33 “CPR Rules” has the meaning set forth in Section 14.2.

1.34 “Cure Period” has the meaning set forth in Section 13.3.

1.35 “Development” means all activities that relate to obtaining, maintaining or expanding Regulatory Approval for a Compound or Product, including research, preclinical testing, toxicology, formulation, Clinical Trials, preparation, submission, review, and development of data or information for the purpose of submission to a Governmental Authority to obtain, maintain or expand Regulatory Approval for a Compound or Product. “Develop” and “Developing” have correlative meanings.

1.36 “Disputes” has the meaning set forth in Section 14.1.

1.37 “Dollar” means a U.S. dollar, and “\$” shall be interpreted accordingly.

1.38 “EMA” means the European Medicines Agency or any successor entity.

1.39 “Executive Officer” means, with respect to Arrowhead, its Chief Executive Officer, and with respect to Horizon, its Chief Strategy Officer.

1.40 “FD&C Act” means the U.S. Federal Food, Drug and Cosmetic Act, as amended, and applicable regulations promulgated thereunder by the FDA.

1.41 “FDA” means the U.S. Food and Drug Administration or any successor entity.

1.42 “Field” means any and all uses.

1.43 “First Commercial Sale” means, with respect to a Product, the first sale to a Third Party for end use or consumption of such Product in a given country following the receipt of Regulatory Approval in such country; provided that “First Commercial Sale” shall not include sale, disposal or use of a Product for marketing, regulatory, development or charitable purposes, such as clinical trials, pre-clinical trials, compassionate use, named patient use, or indigent patient programs, without consideration.

1.44 “FTE” means the equivalent of the work of one qualified employee or agent for the applicable activities, full time, for one year (constituting [***] working hours).

1.45 “FTE Rate” means \$[***] per one full FTE per full 12-month Calendar Year, which rate includes all direct and indirect costs of the performing Party’s FTE, including personnel and travel expenses. Such rate, starting January 1, 2022, will increase on January 1 of each Calendar Year by an amount equal to the increase, if any, in the Consumer Price Index for All Urban Consumers (CPI-U) for the U.S. City Average, calculated by the Bureau of Labor Statistics during the immediately preceding Calendar Year.

1.46 “GAAP” means the then current generally accepted accounting principles in the U.S., as applied on a consistent basis.

1.47 “GCP” or “Good Clinical Practices” means the then-current standards, practices and procedures promulgated or endorsed by the FDA as set forth in the guidelines entitled “Guidance for Industry E6 Good Clinical Practice: Consolidated Guidance,” including related regulatory requirements imposed by the FDA and comparable regulatory standards, practices and procedures promulgated by the EMA or other Regulatory Authority applicable to the Territory, as they may be updated from time to time, including applicable quality guidelines promulgated under the ICH.

1.48 “Generic Product” means, with respect to a Product in a country, any pharmaceutical product that (a) contains a Compound, in the same active ingredient formulation and dosage form as such Product and for the same route of administration as such Product; (b) is approved by the Regulatory Authority in such country (i) in reliance on the Regulatory Approval for such Product in such country or (ii) under a generic pathway approval as a generic of such Product in such country in the Territory; and (c) is sold in such country by a Third Party that is not a Sublicensee and did not purchase such product in a chain of distribution that included any of Horizon or its Affiliates or Sublicensees.

1.49 “GLP” or “Good Laboratory Practices” means the then-current good laboratory practice standards promulgated or endorsed by the FDA as defined in 21 C.F.R. Part 58, and comparable regulatory standards promulgated by the EMA or other Regulatory Authority applicable to the Territory, as they may be updated from time to time, including applicable quality guidelines promulgated under the ICH.

1.50 “GMP” or “Good Manufacturing Practices” means the then-current Good Manufacturing Practices required by the FDA, as set forth in the FD&C Act and the regulations promulgated thereunder, for the manufacture and testing of pharmaceutical materials, and comparable laws or regulations applicable to the manufacture and testing of pharmaceutical materials promulgated by other Regulatory Authorities, as they may be updated from time to time.

1.51 “Governmental Authority” means any multinational, federal, state, local, municipal, provincial or other governmental authority of any nature (including any governmental division, prefecture, subdivision, department, agency, bureau, branch, office, commission, council, court or other tribunal).

1.52 “Horizon Indemnitees” has the meaning set forth in Section 11.1.

1.53 “Horizon Licensed Technology” means (a) Horizon’s rights in any Program IP or Program Patents and (b) any other Information or Patent Controlled by Horizon or any of its Affiliates as of the Effective Date or at any time during the term of activities conducted pursuant to the Research Plan, which Horizon makes available to Arrowhead for use or practice in conducting the activities allocated to Arrowhead under the Research Plan.

1.54 “ICH” means International Conference on Harmonisation.

1.55 “**IND**” means (a) an Investigational New Drug Application as defined in the FD&C Act and applicable regulations promulgated thereunder by the FDA, or (b) the equivalent application to the equivalent agency in any other regulatory jurisdiction, the filing of which is necessary to Initiate or conduct a Clinical Trial of a pharmaceutical product in humans in such jurisdiction.

1.56 “**IND-Enabling Toxicology Studies**” means the pharmacokinetic and toxicology studies required to meet the regulatory requirements for filing an IND.

1.57 “**Indemnified Party**” has the meaning set forth in Section 11.3.

1.58 “**Indemnifying Party**” has the meaning set forth in Section 11.3.

1.59 “**Information**” means any and all data, results, technology, business or financial information or information of any type whatsoever, in any tangible or intangible form, including know-how, trade secrets, practices, techniques, methods, processes, developments, specifications, formulations, or formulae of any type or kind (patentable or otherwise), software, algorithms, marketing reports, expertise, technology, test data (including pharmacological, biological, chemical, biochemical, clinical test data and data resulting from non-clinical studies), CMC information, stability data and other study data and procedures.

1.60 “**Initiation**” means, with respect to a Clinical Trial, the first dosing of the first subject in such Clinical Trial. “**Initiate**” has a correlative meaning.

1.61 “**Joint Program IP**” has the meaning set forth in Section 9.1(b)(iv).

1.62 “**Joint Program Patent**” has the meaning set forth in Section 9.1(b)(iv).

1.63 “**JSC**” has the meaning set forth in Section 2.1

1.64 “**Knowledge**” means, with respect to a Party, the actual knowledge, as of the Effective Date, of such Party’s executive officers or personnel with primary responsibility for the applicable subject matter exercising reasonably diligent inquiry.

1.65 “**Laws**” means all laws, statutes, rules, regulations, ordinances and other pronouncements having the effect of law of any federal, national, multinational, state, provincial, county, city or other political subdivision.

1.66 “**Manufacture**” means all activities related to the manufacturing of a Compound or Product, or any ingredient thereof, including test method development, analytical testing and stability testing, formulation, process development, manufacturing scale-up, manufacturing any Compound or Product in bulk or finished form for Development, manufacturing finished Product for Commercialization, packaging, in-process and finished Product testing, release of Product or any component or ingredient thereof, quality assurance activities related to manufacturing and release of Product, and regulatory activities related to any of the foregoing. “**Manufacturing**” has a correlative meaning.

1.67 “**Net Sales**” means, with respect to a given period of time, gross sales of Product (following its Regulatory Approval) by Horizon, its Affiliates and Sublicensees in such period, less the following deductions which are actually incurred, allowed, paid, accrued or specifically allocated to such gross sales amounts of Product using GAAP applied on a consistent basis:

(a) credits or allowances for defective or damaged Product (including allowances for spoiled, outdated or withdrawn Product), returns or rejections of Product, price adjustments and billing errors;

(b) governmental payments and other rebates, refunds and chargebacks (or equivalents thereof) granted to managed health care organizations; commercial insurance companies; pharmacy benefit managers (or equivalents thereof); federal, state/provincial, local and other governments, their agencies and purchasers and reimbursers; or to trade customers;

(c) normal and customary trade, cash, prompt payment and/or quantity discounts, allowances and credits and mandated discounts;

(d) distribution services agreement fees allowed or paid to Third Party distributors and reasonable fees paid to wholesalers, selling agents (excluding any sales representatives of Horizon or any of its Affiliates or Sublicensees), group purchasing organizations, Third Party payors, other contractees and managed care entities, in each case with respect to such Product;

(e) transportation costs, including insurance, for outbound freight, other transportation charges, additional special packaging;

(f) amounts actually written off as bad debt or otherwise uncollectible with respect to Product; provided that, if any such written-off amounts are subsequently collected, such collected amounts shall be included in Net Sales in the period in which they are collected;

(g) sales taxes, value added taxes and other taxes (other than income taxes) and duties paid in relation to such Product and any other equivalent governmental charges imposed upon the importation, use or sale of Product; and

(h) retroactive price reductions to the Third Party applicable to sales of such Product.

Sales of Product between or among Horizon and its Affiliates or Sublicensees shall be excluded from the computation of Net Sales, but the subsequent final sales of Product to Third Parties by such Affiliates and Sublicensees shall be included in the computation of Net Sales.

Notwithstanding the foregoing, in the event a Product is sold in a country in the Territory as a Combination Product, Net Sales of the Combination Product will be calculated as follows:

(i) If Product and other active component(s) each are sold separately in such country, Net Sales will be calculated by multiplying the total Net Sales (as described above) of the Combination Product by the fraction $A/(A+B)$, where A is the average gross selling price in

such country of the Product sold separately in the same formulation and dosage, and B is the sum of the average gross selling prices in such country of such other active component(s) sold separately in the same formulation and dosage.

(ii) If the Product is sold independently of the other active component(s) therein in such country, but the other active component(s) is not sold independently in such country, Net Sales will be calculated by multiplying the total Net Sales (as described above) of the Combination Product by the fraction A/C where A is the average selling price in such country of such Product sold independently and C is the average selling price in such country of the entire Combination Product.

(iii) If the Product is not sold independently of the other active component(s) therein in such country, but the other active component(s) is sold independently in such country, Net Sales will be calculated by multiplying the total Net Sales (as described above) of the Combination Product by the fraction $1-B/C$ where B is the sum of the average gross selling prices in such country of such other active component(s) sold separately in the same formulation and dosage, and C is the average selling price in such country of the entire Combination Product.

(iv) If the Product is not sold independently in such country and the other active component(s) is not sold independently in such country, the Parties shall determine Net Sales for such Combination Product by mutual agreement based on the relative contribution of the Product and the other active ingredient(s) in the Combination Product.

All discounts, allowances, credits, rebates and other deductions shall be fairly allocated to the Product and, as between Product and other products or services of Horizon, its Affiliates or Sublicensees, shall not be inappropriately allocated.

1.68 “**Non-Breaching Party**” has the meaning set forth in Section 13.3.

1.69 “**Patents**” means (a) pending patent applications, issued patents, utility models and designs; (b) reissues, substitutions, confirmations, registrations, validations, re-examinations, additions, continuations, continued prosecution applications, continuations-in-part, or divisions of or to any of the foregoing; and (c) extensions, renewals or restorations of any of the foregoing by existing or future extension, renewal or restoration mechanisms, including supplementary protection certificates or the equivalent thereof.

1.70 “**Phase 1 Clinical Trial**” means a Clinical Trial of a Product conducted in healthy volunteer subjects or patients with the disease or condition under study to evaluate the drug metabolism, pharmacologic actions, the side effects and, if possible, to gain early evidence on the effectiveness of the Product, as and to the extent defined for the U.S. in 21 C.F.R. § 312.21(a), as amended from time to time, or equivalent law or regulation in regulatory jurisdictions outside the U.S.

1.71 “**Phase 2 Clinical Trial**” means a Clinical Trial of a Product conducted in patients with the disease or condition under study to evaluate the effectiveness of the Product, as and to the extent defined for the U.S. in 21 C.F.R. § 312.21(b), as amended from time to time, or equivalent law or regulation in regulatory jurisdictions outside the U.S.

1.72 “**Phase 3 Clinical Trial**” means a Clinical Trial of a Product with a defined dose or a set of defined doses of such Product on sufficient numbers of human patients designed to confirm with statistical significance the safety and efficacy of such Product and to support a Regulatory Approval as and to the extent defined for the U.S. in 21 C.F.R. § 312.21(c), as amended from time to time, or equivalent law or regulation in regulatory jurisdictions outside the U.S.

1.73 “**Pivotal Clinical Trial**” shall mean (a) a Phase 3 Clinical Trial, or (b) any other Clinical Trial for which the applicable Regulatory Authority has reviewed the existing efficacy and safety data from a Phase 2 Clinical Trial for the Product and has agreed, whether before Initiation of such Clinical Trial (*e.g.*, pursuant to an agreement with or statement from the FDA or the EMA on a ‘Special Protocol Assessment’ or equivalent or other guidance or minutes issued by the FDA or EMA) or after Initiation of such Clinical Trial (*e.g.*, based on an interim data analysis), is sufficient to form the primary basis of an efficacy claim in a Regulatory Authorization Application submission, regardless of whether the sponsor of such trial characterizes or refers to such trial as a “Phase 3,” “Phase 2b” or “Phase 2b/3” trial (or otherwise) in the applicable protocol, on clinicaltrials.gov, or in any other context. If a Clinical Trial is determined by the applicable Regulatory Authority, after review of the efficacy and safety data from a Phase 2 Clinical Trial for the Product, to be sufficient to form the primary basis of an efficacy claim in a Regulatory Authorization Application submission (*i.e.* Clinical Trial constitutes a Pivotal Clinical) without the need for a Phase 3 Clinical Trial(s) prior to submission, then, for purposes of Section 8.2, the Initiation of such Pivotal Clinical Trial shall be deemed to have occurred on the date of such determination by the applicable Regulatory Authority.

1.74 “**Product**” means any pharmaceutical product containing or comprising a Compound as an active pharmaceutical ingredient, whether on its or their own or in combination with other active pharmaceutical ingredients, including all formulations and dosage forms.

1.75 “**Product Infringement**” has the meaning set forth in 9.3(a).

1.76 “**Product-Specific Program Patent**” has the meaning set forth in Section 9.2(b)(i).

1.77 “**Program IP**” has the meaning set forth in Section 9.1(b)(i).

1.78 “**Program Patent**” has the meaning set forth in Section 9.1(b)(i).

1.79 “**Prosecution and Maintenance**” has the meaning set forth in Section 9.2(a).

1.80 “**Regulatory Approval**” means all approvals from the relevant Regulatory Authority in a given country or regulatory jurisdiction of the Regulatory Approval Application for a Product in the Field, including all licenses, registrations, and pricing or reimbursement approvals, that are necessary for the sale and marketing of such Product, including clinical testing, manufacture, distribution, or use of such Product, in such country or regulatory jurisdiction.

1.81 “**Regulatory Approval Application**” means an application to the appropriate Regulatory Authority for approval to sell a Product in any particular jurisdiction, including a New Drug Application in the U.S.

1.82 “**Regulatory Authority**” means, in a particular country or jurisdiction, any applicable Governmental Authority that has the authority to regulate the manufacture, marketing, testing, pricing, or sale of drug products in such country or jurisdiction.

1.83 “**Regulatory Exclusivity**” means any exclusive marketing rights or data exclusivity rights conferred by any Governmental Authority under applicable Law with respect to a Product in a country or jurisdiction in the Territory to prevent Third Parties from Commercializing such Product in such country or jurisdiction, other than a Patent right, including orphan drug exclusivity, pediatric exclusivity, rights conferred in the U.S. under the Hatch-Waxman Act or the FDA Modernization Act of 1997, in the EU under Directive 2001/83/EC, or rights similar thereto in other countries or regulatory jurisdictions in the Territory.

1.84 “**Regulatory Materials**” means regulatory applications, submissions, notifications, communications, correspondence, registrations, Regulatory Approvals or other filings made to, received from or otherwise conducted with a Regulatory Authority in order to Develop, Manufacture, or Commercialize a Product in a particular country or jurisdiction.

1.85 “**Research Period**” means the period beginning on the Effective Date and continuing until Arrowhead’s completion of all deliverables assigned to it in the Research Plan as limited by the futility provisions of the Research Plan.

1.86 “**Research Plan**” means the work plan attached hereto as **Exhibit B** setting forth certain activities to be conducted by the Parties, deliverables, timelines, responsibilities of each Party, and budgeted costs and expenses with respect to such activities, as may be amended in accordance with this Agreement.

1.87 “**Research Program**” has the meaning set forth in Section 4.1.

1.88 “**RNAi Molecule**” means an exogenous double-stranded oligomeric (i.e., RNA or modified variants thereof) molecule incorporating N-acetyl-galactosamine (GalNAc) ligand conjugates.

1.89 “**Royalty Patent**” means (a) any Arrowhead Patent other than any Program Patent or (b) any Program Patent owned solely or jointly by Arrowhead.

1.90 “**Royalty Term**” has the meaning set forth in Section 8.4(b).

1.91 “**Sole Program IP**” has the meaning set forth in Section 9.1(b)(iii).

1.92 “**Sole Program Patent**” has the meaning set forth in Section 9.1(b)(iii).

1.93 “**Subcontractors**” has the meaning set forth in Section 3.1(c).

1.94 “**Subject Patent**” has the meaning set forth in Section 9.5.

1.95 “[***]” has the meaning set forth in Section [***].

- 1.96 “**Sublicensee**” has the meaning set forth in Section 3.3(a).
- 1.97 “**Technology Transfer Period**” has the meaning set forth in Section 7.5.
- 1.98 “**Term**” has the meaning set forth in Section 13.1.
- 1.99 “**Territory**” means all of the countries of the world.
- 1.100 “**Third Party**” means any entity other than Arrowhead or Horizon or an Affiliate of either of them.
- 1.101 “**Third Party Agreement**” has the meaning set forth in Section 3.5(b).
- 1.102 “**U.S.**” means the United States of America, including all possessions and territories thereof.
- 1.103 “**Valid Claim**” means a claim (a) of any unexpired patent issued or granted by a Patent Office that has not been revoked, canceled, or held unenforceable or invalid by a decision of a court or Governmental Authority of competent jurisdiction from which no appeal can be taken, or with respect to which an appeal is not taken within the time allowed for appeal, and that has not been disclaimed or admitted to be invalid or unenforceable through reissue, disclaimer, or otherwise, or (b) of any pending patent application that is being prosecuted in good faith and has not been abandoned or finally disallowed without the possibility of appeal or re-filing of the application and has been pending for less than [***] years from the earliest priority date.
- 1.104 “**VAT**” means value added tax, sales taxes, consumption taxes and other similar taxes imposed or required by applicable Law.

ARTICLE 2 GOVERNANCE

2.1 Joint Steering Committee.

(a) **Formation.** Within forty-five (45) days after the Effective Date (or such longer period as agreed by the Parties), the Parties shall establish and convene a joint steering committee (the “**JSC**”) that will oversee, govern and make decisions with respect to the Research Program. The JSC shall consist of representatives from Arrowhead and Horizon, and operate in accordance with the procedures set forth in this Section 2.1 and any other procedures as agreed upon by the JSC members.

(b) **Purpose.** Except as otherwise provided herein, the role of the JSC shall be to:

(i) encourage and facilitate ongoing communication and cooperation between the Parties with respect to the activities conducted under the Research Plan;

- Plan are performed;
- (ii) ensure the activities to be undertaken by each of the Parties pursuant to the Research Plan are performed;
 - (iii) review and approve any proposed amendments to the Research Plan as may be unanimously agreed;
 - (iv) create new subcommittees or working groups as it deems appropriate, and resolving any disputes within any such subcommittee or working group; and
 - (v) perform such other functions as are expressly delegated to the JSC under this Agreement.

(c) **JSC Decisions.** The JSC will make good faith efforts to make all decisions by consensus. Actions to be taken by the JSC shall be taken only following unanimous vote, with each Party's representatives collectively having one (1) vote. If the JSC fails to reach agreement on a matter before it concerning Section 2.1(b)(ii), [***].

(d) **Membership.** Arrowhead and Horizon shall each designate an equal number of representatives to serve on the JSC by written notices to the other Party. Promptly after the Effective Date, each Party shall designate three (3) representatives for the JSC. The JSC may elect to vary the number of representatives from time to time during the Term; provided that the JSC shall maintain an equal number of representatives from each Party. Each representative shall have the appropriate level of experience in the subject area of the JSC, and at least one (1) representative shall have sufficient seniority within the applicable Party's organization to have the necessary decision-making authority in order for the JSC to fulfill its responsibilities. Either Party may designate substitutes for its JSC representatives if one (1) or more of such Party's designated representatives is unable to be present at a meeting. From time to time, each Party may replace its JSC representatives by written notice to the other Party specifying the prior representative(s) and its or their replacement(s). The JSC in its discretion may create functional subcommittees or working teams.

(e) **Chairperson.** The JSC will have two chairpersons, one designated by each of the Parties. The chairpersons shall be responsible for calling and convening meetings but shall have no special authority over the other members of the JSC and shall have no additional voting rights. The Parties shall alternate for each JSC meeting to have their chairperson (or designate): (i) prepare and circulate an agenda reasonably in advance of the upcoming meeting; and (ii) prepare and issue minutes of the JSC meeting as promptly as practicable thereafter. Such minutes shall not be finalized until the chairperson of the non-preparing Party reviews and approves such minutes in writing.

(f) **Meetings.** The JSC shall meet at such frequency as shall be agreed by the members of the JSC, but not less than once per Calendar Quarter. In addition to such scheduled frequencies, upon Horizon's or Arrowhead's request and as mutually agreed, the JSC shall also meet on an *ad hoc* basis. Other than the initial JSC meeting, which, unless otherwise mutually agreed by the Parties or prohibited by any public health orders governing either Party, shall be held in person, the JSC may meet either (i) in person at either Party's facilities or at such locations as

the Parties may otherwise agree; or (ii) by audio or video teleconference. Additional non-member representatives of a Party having relevant experience may from time to time be invited to participate in a JSC meeting. Non-member participants who are not employees of a Party or its Affiliates shall only be allowed to attend if: (A) the other Party's representatives have consented to the attendance; and (B) such non-member participant is subject to confidentiality and non-use obligations at least as restrictive as those set forth in this Agreement. Each Party shall be responsible for all of its own expenses incurred in connection with participating in the JSC including all travel and all expenses associated with an initial alliance kick-off meeting. All other expenses incurred by the JSC in furtherance of a meeting, such as expenses associated with off-site meetings, shall be shared equally by the Parties.

(g) **Dissolution.** Upon completion of the Research Program, unless the Parties conclude and mutually agree in writing that continuing the JSC as a vehicle for information exchange with respect to Development activities merits retention of the JSC, the JSC will be dissolved.

2.2 **Alliance Managers.** Promptly following the Effective Date, each Party shall designate in writing one (1) representative as its alliance manager ("**Alliance Manager**") to serve as the primary point of contact for the Parties regarding all collaboration and transition activities contemplated under this Agreement. Each Alliance Manager shall facilitate communication and coordination of the Parties' activities under this Agreement relating to the Compounds and Products and shall plan the JSC meetings. The Alliance Managers shall be allowed to attend JSC meetings as observers.

ARTICLE 3 LICENSES

3.1 **Research Licenses.**

(a) **License Grant to Horizon.** Subject to the terms and conditions of this Agreement, Arrowhead hereby grants to Horizon a non-exclusive license under the Arrowhead Licensed Technology, solely to conduct the activities allocated to Horizon under the Research Plan.

(b) **License Grant to Arrowhead.** Subject to the terms and conditions of this Agreement, Horizon hereby grants to Arrowhead a non-exclusive license under the Horizon Licensed Technology, solely to conduct the activities allocated to Arrowhead under the Research Plan.

(c) **Subcontractors.** Each Party shall have the right to grant sublicenses under the license granted to such Party in Section 3.1(a) or Section 3.1(b) to its Affiliates and Third Party subcontractors ("**Subcontractors**") solely to perform activities for or on behalf of such Party under the Research Program, subject to the terms and conditions set forth in Section 4.4.

3.2 **Development and Commercialization License.** Subject to the terms and conditions of this Agreement, Arrowhead hereby grants to Horizon an exclusive (even as to Arrowhead and its Affiliates), royalty-bearing license, with the right to sublicense as provided in

Section 3.3, under the Arrowhead Licensed Technology, to Develop, Manufacture, Commercialize, make, have made, use, sell, offer for sale, import and otherwise exploit Compounds and Products in the Field in the Territory.

3.3 Sublicensing and Subcontracting Rights.

(a) **Sublicenses.** Horizon shall have the right to grant sublicenses of the license granted in Section 3.2 to its Affiliates or Third Parties ([***]), whether directly or through multiple tiers (each such Third Party sublicensee, a “**Sublicensee**”), subject to the following:

(i) Horizon shall remain primarily responsible for the performance of its obligations hereunder and any and all failures by its Affiliates and Sublicensees to comply with the applicable terms of this Agreement;

(ii) such sublicense shall refer to this Agreement and shall not conflict with Horizon’s obligations hereunder;

(iii) within a reasonable time after execution of such sublicense, Horizon shall provide to Arrowhead a copy of such sublicense to any Sublicensee, which may be redacted to omit any terms not relevant to determining Horizon’s and such Sublicensee’s obligations under this Agreement;

(iv) except as otherwise provided in the sublicense, if this Agreement terminates for any reason, upon Horizon’s written request to Arrowhead, any Sublicensee of the license set forth in Section 3.2 shall, from the effective date of such termination, automatically become a direct licensee of Arrowhead on the terms and conditions hereunder with respect to the rights licensed to Horizon and sublicensed to the Sublicensee by Horizon; and

(v) any Affiliate or Sublicensee granted a sublicense of the license contained in Section 3.2 shall have the right to grant further sublicenses to Third Parties ([***]) of same or lesser scope as its sublicense from Horizon, provided that such further sublicenses shall be in accordance with and subject to all of the terms and conditions of this Section 3.3.

(b) **Subcontractors.** Horizon shall have the right to retain Subcontractors to perform any activity in connection with Horizon’s exercise of any of its rights or performance of any of its obligations hereunder, where such activity is to be performed at the direction and control and for the sole benefit of Horizon, its Affiliates or Sublicensees. Such retention of such Subcontractor shall not be a sublicense within the meaning of this Section 3.3 but shall be considered an activity of Horizon under the license granted in Section 3.2. Horizon shall remain liable to Arrowhead for any act or omission of its Subcontractors and any and all failures by such Subcontractors to comply with the terms of this Agreement.

3.4 Retained Rights; No Implied Licenses. Except as expressly granted under Sections 3.1 and 3.2, Arrowhead retains all rights under the Arrowhead Licensed Technology and Horizon retains all rights under the Horizon Licensed Technology, including the right to fulfill its respective obligations under this Agreement. Except as explicitly set forth in this Agreement,

neither Party shall be deemed by estoppel or implication to have granted the other Party any license or other right to any intellectual property of such Party.

3.5 Third Party Agreements.

(a) During the Term, if Arrowhead or its Affiliate is planning to enter into an agreement with a Third Party under which Arrowhead or its Affiliate [***], then Arrowhead shall provide Horizon with written notice thereof. If the Parties mutually agree that such Third Party Information or Patent (i) is [***] and (ii) is not [***], Horizon, itself or through any of its Affiliates, shall have the sole right to obtain such license or rights on a worldwide or country-by-country basis, in Horizon sole discretion.

(b) During the Term, subject to Section 3.5(a), if Arrowhead or any of its Affiliates enter into an agreement with a Third Party under which Arrowhead or its Affiliate [***] (each, an “**Arrowhead Third Party Agreement**”), then Arrowhead shall inform Horizon and shall provide Horizon with a copy of the Arrowhead Third Party Agreement. If Horizon notifies Arrowhead in writing that [***], then (i) [***]; (ii) [***]; and (iii) [***].

3.6 Exclusivity.

(a) Subject to Section 3.6(b), during the Term, Arrowhead and its Affiliates shall not conduct or participate in, or advise, assist, license, sublicense or enable any Third Party to conduct or participate in, the research, development, manufacture or commercialization of any Competing Product.

(b) In the event that (i) after the Effective Date, a Third Party becomes an Affiliate of Arrowhead as a result of a Change of Control of Arrowhead, and (ii) as of the closing date of such Change of Control, such Third Party is engaged in the conduct of a Competing Program, then such Affiliate may continue to conduct such Competing Program without breaching the obligations of Section 3.6(a); provided that (A) such activities are conducted independently of the activities pursuant to this Agreement and do not use any Arrowhead Licensed Technology and (B) Arrowhead shall, and shall cause its Affiliates to, (x) segregate such Competing Program from the Development, Manufacture, Commercialization and other exploitation of Compounds and Products pursuant to this Agreement, and (y) establish reasonable firewalls to prevent disclosure of non-public plans or non-public information relating to the Compounds or Products, or any Confidential Information of Horizon, to any personnel of Arrowhead or its Affiliates who are conducting the Competing Program.

ARTICLE 4 RESEARCH PROGRAM

4.1 **Overview; Research Plan.** The Parties shall collaborate on a program for discovery and preclinical research in preparation for IND filing of one Product, which includes all activities and deliverables described in **Exhibit B** (“**Research Program**”), during the Research Period. The Research Program shall be conducted in accordance with the Research Plan and in compliance with applicable Laws. The JSC shall review the Research Plan no less than once per

Calendar Quarter. Each Party shall use Commercially Reasonable Efforts to conduct the activities allocated to it in the Research Plan, and the JSC shall facilitate the conduct of such activities.

4.2 Records; Updates. Each Party shall maintain complete, current and accurate records of all activities conducted pursuant to the Research Plan, and all data and other information resulting from such Research Plan activities. Such records shall fully and properly reflect all work performed and results achieved in the performance of such Research Plan activities in good scientific manner appropriate for regulatory and patent purposes. During each JSC meeting, each Party shall provide the JSC with an update on the progress of Research Plan activities and any information and data generated from such Research Plan activities since the prior JSC meeting.

4.3 Research Costs. Unless otherwise specified in the Research Plan, Arrowhead shall be responsible for all costs and expenses of the Research Program, except that [***].

4.4 Subcontractors. Each Party shall have the right to engage Subcontractors to perform any portion of its obligations under the Research Program; provided that, (a) such Party shall promptly provide the other Party notice thereof, and (b) each Subcontractor shall be required to agree in writing to be bound by terms with respect to (i) maintenance of the confidentiality of proprietary information that are no less stringent than those contained in this Agreement and (ii) ownership of intellectual property that are consistent with those contained in this Agreement. Each Party shall remain liable to the other Party for any act or omission of its Subcontractors and any and all failures by such Subcontractors to comply with the terms of this Agreement.

ARTICLE 5 DEVELOPMENT AND COMMERCIALIZATION

5.1 General. Except as expressly provided in the Research Plan, Horizon (itself and with its Affiliates and Sublicensees) shall have the sole right and responsibility, in its sole discretion and at its expense, for all aspects of the Development and Commercialization of the Compounds and Product in the Territory, including filing of an IND, and all decisions regarding the clinical development plan and regulatory strategy, design, sale, price and promotion, of Compounds and Products. Arrowhead will promptly transfer to Horizon all Arrowhead Know-How, including all materials for supporting regulatory filings consistent with Horizon's obligations under Article 6, (a) promptly following the Effective Date, and (b) within [***] following completion of the Research Program. After [***] Horizon may request that Arrowhead provide Horizon assistance and cooperation in support of its Development activities hereunder, including with respect to Clinical Trial design, and Arrowhead shall provide reasonable assistance and cooperation at Horizon's cost. Arrowhead shall charge such costs to Horizon [***] in accordance with a written budget agreed to in advance by Arrowhead and Horizon.

5.2 Diligence. Horizon shall use Commercially Reasonable Efforts to Develop, seek Regulatory Approval of, and, if successful, Commercialize a Product in the United States.

5.3 Communication. From completion of the Research Program until a Product receives Regulatory Approval, Horizon shall provide Arrowhead summaries on or prior to January 31 of each Calendar Year, of (a) material developments with respect to Products, including the

anticipated timing of completion of the milestone events set forth in Section 8.2, (b) any Regulatory Approvals for Products in the Territory received, and (c) manufacturing information pursuant to Section 7.4 of this Agreement. All reports and other Information provided by Horizon under this Section 5.3 will be Horizon's Confidential Information, subject to the terms of Article 12.

ARTICLE 6 REGULATORY

6.1 Regulatory Responsibilities. Horizon (itself and with its Affiliates and Sublicensees) shall have the sole right and responsibility, in its sole discretion and at its expense, for preparing, filing and maintaining all Regulatory Materials for Products with Regulatory Authorities related to Products in the Territory, and Horizon shall own all Regulatory Materials (including all INDs, NDAs, Regulatory Approval Applications and Regulatory Approvals) for Products in the Territory and otherwise shall be responsible for all regulatory matters with respect to Products in the Territory.

6.2 Regulatory Matters. Horizon shall keep Arrowhead reasonably informed of all material regulatory developments relating to Products in the Territory through the annual reports under Section 5.3. Within thirty (30) days following the [***], Arrowhead shall provide Horizon with such documentation that is in Arrowhead's Control and necessary or reasonably useful to support any Regulatory Materials (including IND, NDAs or Regulatory Approval Applications) to Regulatory Authorities with respect to the Development, Manufacture and Commercialization, as applicable, of Compounds and Products.

6.3 Arrowhead Regulatory Support. Following the [***], Horizon may request that Arrowhead provide assistance and cooperation concerning regulatory filings with respect to any Compound or Product, including (a) providing any Information, materials or other documentation within Arrowhead's Control as necessary or reasonably useful for Horizon to prepare any Regulatory Materials (including IND, NDAs or Regulatory Approval Applications) for Products, or as otherwise requested by Regulatory Authorities, in the Territory, (b) [***], and (c) making available competent personnel to attend regulatory meetings or join such meetings by teleconference, and Arrowhead shall provide such reasonable assistance and support at Horizon's cost. Arrowhead shall charge such costs to Horizon [***] in accordance with a written budget agreed to in advance by Arrowhead and Horizon. For clarity, to the extent the Research Plan requires Arrowhead to provide regulatory support to Horizon the cost of such support shall be borne [***].

6.4 Adverse Event Reporting.

(a) Horizon shall be responsible for creating and maintaining a global safety database for the Product in the Territory, [***]. Horizon shall be responsible for reporting quality complaints, adverse events and safety data related to Products to applicable Regulatory Authorities in the Territory, as well as responding to safety issues and to all requests of Regulatory Authorities relating to Products in the Territory. Arrowhead will not have direct access to the global safety

database. Horizon will provide to Arrowhead such information from the safety database as Arrowhead may reasonably require to satisfy Arrowhead's obligations under applicable Laws.

(b) Prior to the commencement of clinical development of a Product, Arrowhead may request that the Parties discuss in good faith to determine whether a procedure for the mutual exchange of adverse event reports and safety information associated with the Product is reasonably required of the Parties in order to comply with applicable Laws. If the Parties so determine, the operating procedure respecting such adverse event reports and safety information exchange shall be the subject of a mutually agreed-upon written pharmacovigilance agreement between the Parties.

ARTICLE 7 MANUFACTURE AND SUPPLY

7.1 Preclinical Supply for Research Program. Arrowhead shall supply all Compounds and Products for use in the conduct of the Research Program, subject to Section 4.3, and in accordance with the Research Plan and Exhibit H.

7.2 Clinical Supply. Prior to [***], the Parties shall discuss the supply of Compounds or Products for use in the conduct of subsequent Clinical Trials. If the Parties agree that Arrowhead will continue to provide Horizon with clinical supply of Compounds or Products, the Parties shall negotiate in good faith to enter into a clinical supply agreement and related quality technical agreement in accordance with the terms set forth in Exhibit H and other customary terms and conditions consistent with industry standard practices for such a clinical supply arrangement. If the Parties agree that Horizon will be responsible for the clinical supply of Compounds or Products, Arrowhead shall transfer to Horizon (or its Third Party manufacturer, as designated by Horizon in its sole discretion) all relevant manufacturing processes and Arrowhead Know-How as is necessary or reasonably useful for Horizon (or its Third Party manufacturer) to manufacture the Compounds and Products, including all Information or documents reasonably necessary or useful for supporting Regulatory Materials.

7.3 Commercial Supply. Prior to [***], the Parties shall discuss the commercial supply of Products. If the Parties agree that Arrowhead will continue to provide Horizon with commercial supply of Products, the Parties shall negotiate in good faith to enter into a commercial supply agreement and related quality technical agreement with customary terms and conditions consistent with industry standard practices for such a commercial supply arrangement. If the Parties agree that Horizon will be responsible for the commercial supply of Compounds or Products, Arrowhead shall transfer to Horizon (or its Third Party manufacturer, as designated by Horizon in its sole discretion), to the extent not already transferred to Horizon (or its Third Party manufacturer), all relevant manufacturing processes and Arrowhead Know-How as is necessary or reasonably useful for Horizon (or its Third Party manufacturer) to manufacture the Compounds and Products, including all Information or documents reasonably necessary or useful for supporting Regulatory Materials.

7.4 Manufacturing Cooperation. Each Party shall keep the other Party reasonably informed of the identities of any Third Party manufacturers and contract laboratories performing

Manufacturing activities for Compounds and the Product (in the case of Horizon, through the annual reports under Section 5.3 and, once a Product receives Regulatory Approval, through annual updates communicated through the Alliance Managers). During the [***], and at any time during the Term in which [***], Arrowhead shall keep Horizon reasonably informed of any material improvements made by it or its Affiliates or Third Party manufacturers to the manufacturing processes or analytical methods for RNAi Molecules through periodic updates communicated through the Alliance Managers. At any time during the Term which Arrowhead, its Affiliates or its contract manufacturer is Manufacturing Compound or Product to supply to Horizon under this Article 7, Horizon shall have the right to access Arrowhead's, its Affiliates' or its contract manufacturer's facilities (including contract laboratories), by means of a person-in-plant, to observe and review operations related to the Manufacture of Compounds and Products.

7.5 Manufacturing Technology Transfer and Manufacturing Support. Upon Horizon's reasonable notice and at no additional cost to Horizon, during [***] (the "**Technology Transfer Period**") Horizon or its Affiliate shall have the right to meet and access Arrowhead's appropriate personnel (upstream, downstream, formulation, and analytical scientists, regulatory, and production personnel) to inquire and discuss the processes for Manufacturing Compound and Products, for the purposes of supporting the completion of the transition and development services and transferring manufacturing know-how to Horizon (or its designated contract manufacturer), as applicable. Following the Technology Transfer Period, Horizon may request that Arrowhead provide assistance and cooperation concerning the Manufacture of Products, and Arrowhead shall provide reasonable assistance and cooperation at Horizon's cost. Arrowhead shall charge such costs to Horizon [***] in accordance with a written budget agreed to in advance by Arrowhead and Horizon.

ARTICLE 8 FINANCIAL TERMS

8.1 Upfront Payment. Within thirty (30) days after the Effective Date, Horizon shall pay to Arrowhead a one-time, non-refundable and non-creditable upfront payment of forty million Dollars (\$40,000,000).

8.2 Development and Regulatory Milestone Payments. Within [***] days after the first achievement by a Product of any development and regulatory milestone event set forth below, Horizon shall pay to Arrowhead the corresponding one-time, non-refundable, non-creditable development and regulatory milestone payments specified below. For clarity, each milestone payment below shall only be payable once, and the total amount of milestone payments made by Horizon to Arrowhead under this Section 8.2 shall in no event exceed [***] Dollars (\$[***]).

| Milestone Event | Milestone Payment |
|-----------------|-------------------------|
| [***] | [***] Dollars (\$[***]) |

8.3 Sales Milestones. Within [***] days after the Calendar Quarter in which any sales milestone event set forth below is achieved by a Product, Horizon shall make the corresponding one-time, non-refundable (except as set forth in Section 8.8), non-creditable sales milestone payments to Arrowhead specified below. For clarity, each milestone payment below shall only be payable once, and the total amount of milestone payments made by Horizon to Arrowhead under this Section 8.3 shall in no event exceed [***] Dollars (\$[***]).

| Milestone Event | Milestone Payment |
|---|-------------------------|
| The aggregate Net Sales of a Product in the Territory [***] reaches [***] Dollars (\$[***]) | [***] Dollars (\$[***]) |
| The aggregate Net Sales of a Product in the Territory [***] reaches [***] Dollars (\$[***]) | [***] Dollars (\$[***]) |
| The aggregate Net Sales of a Product in the Territory [***] reaches [***] Dollars (\$[***]) | [***] Dollars (\$[***]) |
| The aggregate Net Sales of a Product in the Territory [***] reaches [***] Dollars (\$[***]) | [***] Dollars (\$[***]) |

8.4 Royalties

(a) Royalty Rates. Subject to this Section 8.4, in each Calendar Quarter during the Royalty Term, Horizon shall pay to Arrowhead non-creditable, non-refundable (except as set forth in Section 8.8) royalties on annual Net Sales of Products in the Territory, as calculated by multiplying the applicable royalty rate by the corresponding amount of incremental Net Sales of Products in the Territory in each Calendar Year, as follows:

| Annual Net Sales of Products | Royalty Rate |
|--|--------------|
| For that portion of aggregate Net Sales of Products in each Calendar Year less than or equal to [***] Dollars (\$[***]) | [***] |
| For that portion of aggregate Net Sales of Products in each Calendar Year greater than [***] Dollars (\$[***]) but less than or equal to [***] Dollars (\$[***]) | [***] |
| For that portion of aggregate Net Sales of Products in each Calendar Year greater than [***] Dollars (\$[***]) but less than or equal to [***] Dollars (\$[***]) | [***] |
| For that portion of aggregate Net Sales of Products in each Calendar Year greater than [***] Dollars (\$[***]) | [***] |

(b) **Royalty Term.** Royalties shall be paid under this Section 8.4, on a Product-by-Product and country-by-country basis, commencing on the First Commercial Sale of a Product in a country and ending on the later of (i) the last-to-expire Valid Claim of a Royalty Patent that covers the composition of matter or method of use of such Product in such country, (ii) the expiration of Regulatory Exclusivity for such Product in such country, and (iii) the [***] anniversary of the First Commercial Sale of such Product in such country (“**Royalty Term**”).

(c) **No Valid Claim.** If, during the Royalty Term for a Product in a country, the composition of matter or method of use of such Product in such country is not covered by a Valid Claim of a Royalty Patent, then the applicable royalty rate set forth in Section 8.4(a) with respect to Net Sales of such Product and such country shall be reduced by [***] during the period of the Royalty Term in which no Valid Claim of a Royalty Patent exists.

(d) **Generic Entry.** If, during the Royalty Term for a Product in a country, any Generic Product with respect to such Product is sold in such country, then the applicable royalty rate set forth in Section 8.4(a) with respect to Net Sales of such Product and such country shall be reduced by [***] for the remainder of the Royalty Term.

(e) [***].

(f) **Royalty Floor.** In no event shall the application of [***] reduce the royalty payable on Net Sales of a Product in a country in a Calendar Quarter during the Royalty Term to less than [***] of the royalty that would be payable on Net Sales of such Product in such country determined in accordance with Section 8.4(a) (as reduced by Section 8.4(c), as applicable) without application of any such reductions.

(g) **Royalty Reports and Payments.** Within [***] days following the end of each Calendar Quarter, commencing with the Calendar Quarter in which the First Commercial Sale of any Product is made anywhere in the Territory, Horizon shall provide Arrowhead with a report containing the following information for the applicable Calendar Quarter: (i) the amount of gross sales of Product in the Territory, (ii) an itemized calculation of Net Sales in the Territory (iii) a calculation of the royalty payment due on such sales, and (iv) the exchange rate for such country. Concurrent with the delivery of the applicable quarterly report, Horizon shall pay in Dollars all amounts due to Arrowhead pursuant to Section 8.4 in such Calendar Quarter.

8.5 [***]

8.6 **Currency of Payments.** Unless otherwise set forth in this Agreement or agreed to by the Parties, all payments under this Agreement shall be made in Dollars by wire transfer of immediately available funds into an account designated by Arrowhead. Net Sales outside of the U.S. shall be first determined in the currency in which they are earned and shall then be converted into an amount in Dollars using Horizon’s customary and usual conversion procedures used in preparing its financial statements pursuant to GAAP for the applicable reporting period.

8.7 **Late Payments.** If Arrowhead does not receive payment of any sum due to it on or before the due date, Arrowhead shall provide notice to Horizon of such late payment. If Horizon does not make payment within [***] Business Days following receipt of such notice, then any

portions thereof due hereunder which are not paid on the date such payments are due under this Agreement will bear interest at the per annum rate of [***] percent ([***]%) over the then-current prime rate reported in *The Wall Street Journal*.

8.8 Records; Audits. Horizon and its Affiliates will, and Horizon will cause each of its Sublicensees, if any, to, maintain complete and accurate records in sufficient detail to confirm the accuracy of the calculation of royalty payments and the achievement of milestone events, for a period of [***] after the Calendar Year in which such sales or events occurred. Upon reasonable prior notice and without disruption to Horizon's business, such records of Horizon and its Affiliates shall be made available during regular business hours for a period of [***] from the end of the Calendar Year to which they pertain for examination, and not more often than [***] each Calendar Year, by an independent certified public accountant selected by Arrowhead and reasonably acceptable to Horizon, for the sole purpose of and only to the extent necessary for verifying the accuracy of the financial reports furnished by Horizon pursuant to this Article 8. Such independent accountant shall disclose to Arrowhead only the amounts that such independent accountant believes to be due and payable hereunder to Arrowhead, details concerning any discrepancy from the amount paid and the amount due, and shall disclose no other information revealed in such audit. The records for any particular Calendar Year shall only be subject to [***] audit hereunder. Any and all records examined by such independent accountant shall be deemed Horizon's Confidential Information which may not be disclosed by such independent accountant to any Third Party, and Horizon may require such independent accountant to enter into an appropriate written agreement obligating it to be bound by obligations of confidentiality and restrictions on use of such Confidential Information that are no less protective than those set forth in Article 12. If, as a result of any inspection of the books and records of Horizon, it is shown that payments under this Agreement were less than the amount which should have been paid, then Horizon shall make all payments required to be made from the original due date to eliminate any discrepancy revealed by such inspection within [***] days. If, as a result of any inspection of the books and records of Horizon, it is shown that payments under this Agreement were more than the amount which should have been paid, then Arrowhead shall, at Horizon's election, either make all payments required to be made to eliminate any discrepancy revealed by such inspection within [***] days or credit such amounts to Horizon against future payments. Arrowhead shall pay for such audits, except that in the event that the audited amounts were underpaid by Horizon by more than [***] percent ([***]%) of the undisputed amounts that should have been paid during the period in question as per the audit, Horizon shall pay the costs of the audit.

8.9 Taxes.

(a) **Taxes on Income.** Each Party shall be solely responsible for the payment of all taxes imposed on its share of income arising directly or indirectly from the efforts of the Parties under this Agreement.

(b) **VAT on Payments.** All payments due under this Agreement are exclusive of VAT. If any VAT is chargeable in respect of amounts payable pursuant to this Agreement, VAT shall be charged at the applicable rate required by the applicable Law and the recipient of such payment shall pay the VAT amount on receipt of a VAT invoice in the appropriate form.

(c) **Cooperation.** The Parties agree to cooperate with one another and use reasonable efforts to reduce or eliminate tax withholding or similar obligations in respect of royalties, milestone payments, and other payments made by Horizon to Arrowhead under this Agreement. To the extent Horizon is required under the Code, or any other tax Laws to deduct and withhold taxes on any payment to Arrowhead, Horizon shall pay the amounts of such taxes to the proper Governmental Authority in a timely manner and promptly transmit to Arrowhead an official tax certificate or other reasonable evidence of such withholding. If any taxes are so deducted or withheld, such deducted or withheld amounts shall be treated for all purposes of this Agreement as having been paid to Arrowhead. Upon Horizon's reasonable request, Arrowhead shall provide Horizon any tax forms (including a United States tax "residency certificate", Internal Revenue Service Form W-8BEN or W-8ECI or other applicable Internal Revenue Service Form) that may be reasonably necessary in order for Horizon to determine whether to withhold tax on any such payments or to withhold tax on such payments at a reduced rate under the Code or any other tax Laws, including any applicable bilateral income tax treaty. Horizon shall give reasonable support so that any withholding tax or value added tax may be minimized or avoided to the extent permitted under the applicable Laws and treaties. Each Party shall provide the other with reasonable assistance to enable the recovery, as permitted by applicable Laws, of withholding taxes, value added taxes, or similar obligations resulting from payments made under this Agreement, such recovery to be for the benefit of the Party bearing such withholding tax or value added tax. Horizon shall require its Sublicensees in the Territory to cooperate with Arrowhead in a manner consistent with this Section 8.9(c).

ARTICLE 9 INTELLECTUAL PROPERTY

9.1 Ownership.

(a) **Background IP.** Each Party shall retain all right, title and interest in and to any Information or Patents Controlled by such Party or its Affiliate as of the Effective Date, or which becomes Controlled by such Party or its Affiliate after the Effective Date and independently of this Agreement ("**Background IP**"), including all Patents claiming such Background IP ("**Background Patents**"). Nothing in this Agreement shall assign any ownership of a Party's Background IP to the other Party.

(b) **Program IP.**

(i) **Disclosure.** Each Party will disclose to the other Party any Information or Patents conceived, reduced to practice, discovered, developed or otherwise made solely or jointly by or on behalf of such Party or its Affiliates during the course of, arising out of or as a result of the Research Program ("**Program IP**"), including all Patents claiming such Program IP ("**Program Patents**"), and such disclosure shall (A) be made promptly and in any event reasonably prior to the filing of any patent application with respect to such Program IP, and (B) shall include all invention disclosures or other similar documents submitted to such Party by its or its Affiliates' employees, agents or independent contractors relating thereto.

(ii) **Inventorship.** The determination of inventorship and whether Program IP is conceived, reduced to practice, discovered, developed or otherwise made under this Agreement solely by a Party or jointly with the other Party for the purpose of allocating proprietary rights (including Patent, copyright or other Intellectual Property Rights) therein, shall, for purposes of this Agreement, be made in accordance with the United States patent law and other applicable Law in the United States irrespective of where such conception, reduction to practice, discovery, development or making occurs.

(iii) **Sole Program IP.** As between the Parties, each Party shall own and retain all right, title, and interest in and to any and all Program IP that is conceived, reduced to practice, discovered, developed or otherwise made solely by or on behalf of such Party or its Affiliates (including subcontractors thereof) ("**Sole Program IP**"), including all Program Patents claiming such Sole Program IP ("**Sole Program Patents**").

(iv) **Joint Program IP.** As between the Parties, all right, title, and interest in and to any and all Program IP that is conceived, discovered, developed or otherwise made jointly by or on behalf of Horizon or its Affiliates on the one hand, and Arrowhead or its Affiliates on the other hand ("**Joint Program IP**"), including all Program Patents claiming such Joint Program IP ("**Joint Program Patents**"), shall be owned jointly by the Parties, with each Party owning an equal, undivided interest in and to such Joint Program IP. Subject to the license grants set forth in Section 3.1 and Section 3.2, and to Arrowhead's obligations under Section 3.6, each Party shall have the right to exploit the Joint Program IP without a duty of seeking consent from or accounting to the other Party.

(v) **Assignment.** Each Party shall cause any person or entity that perform activities for such Party under this Agreement to be under an obligation to assign (or, if such Party is unable to cause such person or entity to agree to such assignment obligation despite such Party's using commercially reasonable efforts to negotiate such assignment obligation, provide a license under) their rights in any Information and inventions resulting therefrom to such Party, except where applicable Law requires otherwise and except in the case of governmental, not-for-profit and public institutions which have standard policies against such an assignment (in which case a suitable license, or right to obtain such a license, shall be obtained).

9.2 Patent Prosecution.

(a) **Background Patents.** As between the Parties, the Party that owns Background Patents shall have the sole right (but not the obligation) to control the preparation, filing, prosecution and maintenance (including any oppositions, interferences, reissue proceedings, reexaminations, post-grant proceedings, supplemental examinations, post grant review proceedings, *inter partes* review proceedings, patent interference proceedings, opposition proceedings, derivation proceedings, reissue and reexamination, maintenance and defense) (such activities collectively, the "**Prosecution and Maintenance**") of any of such Background Patents on a worldwide basis, at such Party's sole cost and expense. For any of Arrowhead's Background Patents that are Arrowhead Patents that claim or cover any Compound or Product (including the nucleotide sequences of any Compound or Product) or the Manufacture or use thereof, (i) Horizon shall have the right to review and comment on any filings with respect to the Prosecution and

Maintenance of such Arrowhead Patents, and Arrowhead shall consider any such comments in good faith, and (ii) if Arrowhead intends to allow any such Arrowhead Patent to lapse or become abandoned, Arrowhead shall notify Horizon at least [***] days in advance, and to the extent not prohibited by any of Arrowhead's agreements with Third Parties existing as of the Effective Date, Horizon shall have the right, but not the obligation, to assume responsibility for the Prosecution and Maintenance of such Arrowhead Patent, using counsel of Horizon's choice at Horizon's sole cost and expense.

(b) Program Patents.

(i) Product-Specific Program Patents and Joint Program Patents. As between the Parties, Horizon shall have the first right, but not the obligation, to control the Prosecution and Maintenance of (A) [***] ("**Product-Specific Program Patents**"), provided that any Program Patents that are [***] shall not be deemed "Program-Specific Program Patents", and (B) any other Joint Program Patents, using counsel of Horizon's choice at Horizon's sole cost and expense. Horizon shall reasonably inform and consult with Arrowhead, and shall take Arrowhead comments into good faith consideration, with respect to the Prosecution and Maintenance of Product-Specific Program Patents and other Joint Program Patents. Horizon shall provide to Arrowhead copies of any correspondence relating to Prosecution and Maintenance of Product-Specific Program Patents or other Joint Program Patents reasonably in advance of their being filed or promptly upon their being received, including draft filings, reasonably in advance of their being filed, so that Arrowhead can comment and provide input with respect to such draft filings. Horizon agrees to discuss and consider in good faith any changes reasonably requested by Arrowhead to such correspondence, including draft filings, as promptly as practicable upon their being received, toward the objective of optimizing overall patent protection for Compounds or Products. If Horizon intends to allow any such Product-Specific Program Patent (other than any Product-Specific Program Patent that are Sole Program Patents owned by Horizon) or other Joint Program Patent to lapse or become abandoned, Horizon shall notify Arrowhead at least [***] days in advance, and the Parties shall promptly discuss in good faith whether there is a *bona fide* strategic reason to allow such Product-Specific Program Patent to lapse or become abandoned with a primary goal of optimizing overall patent protection for Compounds or Products. If there is no such *bona fide* strategic reason, then Arrowhead shall have the right, but not the obligation to assume responsibility for the Prosecution and Maintenance of such Product-Specific Program Patent or other Joint Program Patent. Upon such assumption, Arrowhead shall control the Prosecution and Maintenance of Product-Specific Program Patent or Joint Program Patent pursuant to the terms and conditions set forth above, *mutatis mutandis*, using counsel of its choice at its cost and expense.

(ii) Other Sole Program Patents. Subject to Section 9.2(b)(i), the Party that owns any Sole Program Patents shall have the first right, but not the obligation, to control the Prosecution and Maintenance of such Sole Program Patents, using counsel of its choice at its sole cost and expense. The prosecuting Party shall reasonably inform and consult with the non-prosecuting Party, and shall take the other Party's comments into good faith consideration, with respect to the Prosecution and Maintenance of such Sole Program Patents. The prosecuting Party shall provide to the other Party copies of any correspondence relating to the Prosecution and Maintenance of such Sole Program Patents reasonably in advance of their being filed or promptly

upon their being received, including draft filings, reasonably in advance of their being filed, so that the other Party can comment and provide input with respect to such draft filings. The prosecuting Party agrees to discuss and consider in good faith any changes reasonably requested by the non-prosecuting Party to such correspondence, including draft filings, as promptly as practicable upon their being received, toward the objective of optimizing overall patent protection for Compounds or Products. If a Party intends to allow any such Sole Program Patent owned by it to lapse or become abandoned, the Party owning such Sole Program Patent shall notify the other Party at least [***] days in advance, and such Party shall have the right, but not the obligation to assume responsibility for the Prosecution and Maintenance of such Sole Program Patent. Upon such assumption, the Party assuming such right shall be deemed the prosecuting Party with respect to such Sole Program Patent and shall control the Prosecution and Maintenance of such Sole Program Patent pursuant to the terms and conditions set forth above, *mutatis mutandis*, using counsel of its choice at its cost and expense.

(c) **Cooperation.** Each Party shall provide the other Party all reasonable assistance and cooperation, at the other Party's request and expense, in the Prosecution and Maintenance of Patents as set forth in this Section 9.2, including providing any necessary powers of attorney and executing any other required documents or instruments for such prosecution. Each Party shall execute and deliver to the other assignments with respect to any Patents in a mutually agreeable form and will take whatever actions reasonably necessary (including the appointment of the other Party as its attorney in fact solely to make such assignment) to effect such assignment, in accordance with the ownership provisions provided above in Section 9.1. The prosecuting Party under this Section 9.2 agrees to conduct such prosecution toward the objective of optimizing overall patent protection for Compounds and Products.

9.3 Patent Enforcement.

(a) **Notification.** If either Party (i) becomes aware of any alleged or threatened infringement of any Arrowhead Patents or any Program Patents by a Third Party in the Territory based on the development, commercialization or exploitation of, or an application to register or market, a product containing a Compound or any Product in the Territory, (ii) receives notice alleging that a Third Party's manufacture, use, or sale of the product containing a Compound or any Product does not infringe any Arrowhead Patent or Program Patent, or that such Patent is invalid or unenforceable (such as a certification under 21 U.S.C. §§ 355(b)(2)(A)(iv) or 355(j)(2)(A)(vii)(IV), 21 C.F.R. §§ 314.52 or 314.95, or under any other law anywhere in the world that by its effect permits a Third Party to support its application for approval with any safety, efficacy, or other data generated in developing a Compound or Product), or (iii) otherwise becomes aware of the submission of an application that is supported for approval with any safety, efficacy, or other data generated in developing a Compound or Product (such as an application under 21 U.S.C. §§ 355(b)(2) or 355(j) or an equivalent application in another jurisdiction in the Territory) to any Regulatory Authority (each, a "**Product Infringement**"), it shall promptly notify the other Party in writing to that effect and the Parties will consult with each other regarding any actions to be taken with respect to such Product Infringement. Each Party shall share with the other Party all Information available to it regarding such alleged Product Infringement.

(b) **Enforcement Against Product Infringements.**

(i) **Product-Specific Program Patents, Joint Program Patents, and Horizon**

Background Patents.

(1) **Horizon's First Right to Enforce.** As between the Parties, Horizon shall have the first right, but not the obligation, to bring a suit or other action against any person or entity engaged in a Product Infringement of any Product-Specific Program Patents, Joint Program Patents, or Horizon Background Patents. Horizon shall keep Arrowhead regularly informed of the status and progress of such enforcement efforts, shall reasonably consider Arrowhead's comments on any such efforts, including determination of litigation strategy and filing of material papers to the competent court. In addition, Horizon shall provide Arrowhead with drafts of all material papers to be filed with the court and shall reasonably consider comments provided by Arrowhead before filing such papers. Arrowhead shall provide Horizon reasonable assistance in such enforcement pursuant to this Section 9.3(b)(i)(1), at Horizon's request and expense, including joining such action as a party plaintiff if required by applicable Laws to pursue such action.

(2) **Arrowhead's Step-In Right to Enforce.** If (A) Horizon elects not to commence a suit to enforce any Program Patent that Horizon has the first right to enforce (other than any Program Patent that is a Sole Program Patent owned by Horizon) against any person or entity engaged in a Product Infringement, or settle or otherwise secure the abatement of such Product Infringement, and (B) with Horizon's prior written consent, such consent not to be unreasonably withheld, then Arrowhead shall have the right, but not the obligation, to commence a suit or take action to enforce such Program Patent against such Product Infringement in the Territory, at Arrowhead's cost and expense. In such event, promptly after Horizon's notice to Arrowhead that it does not elect to enforce such Program Patent, the Parties shall meet to discuss in good faith the strategy for enforcing such Program Patent. In addition, Arrowhead shall provide Horizon with drafts of all material papers to be filed with the court and shall consider in good faith all reasonable comments thereto by Horizon before filing such papers. Horizon shall be entitled to separate representation in such matter by counsel of its own choice and at its own expense.

(ii) **Arrowhead Platform Patents**

(1) **Arrowhead's First Right to Enforce.** As between the Parties, Arrowhead shall have the first right, but not the obligation, to bring a suit or other action against any person or entity engaged in a Product Infringement of (i) any Arrowhead Background Patents, or (ii) [***] (collectively, (i) and (ii) shall be referred to as "**Arrowhead Platform Patents**"). Arrowhead shall keep Horizon regularly informed of the status and progress of such enforcement efforts, shall reasonably consider Horizon's comments on any such efforts, including determination of litigation strategy and filing of material papers to the competent court, which consent shall not be unreasonably withheld or delayed. In addition, Arrowhead shall provide Horizon with drafts of all material papers to be filed with the court and shall reasonably consider comments provided by Horizon before filing such papers. Horizon shall provide Arrowhead reasonable assistance in such enforcement pursuant to this Section 9.3(b)(ii)(1), at Arrowhead's

request and expense, including joining such action as a party plaintiff if required by applicable Laws to pursue such action.

(2) **Horizon's Step-In Right to Enforce.** If (A) Arrowhead elects not to commence a suit to enforce any Arrowhead Platform Patent against any person or entity engaged in a Product Infringement, or settle or otherwise secure the abatement of such Product Infringement, and (B) with Arrowhead's prior written consent, such consent not to be unreasonably withheld, then Horizon shall have the right, but not the obligation, to commence a suit or take action to enforce such Arrowhead Platform Patent against such Product Infringement in the Territory, at Horizon's cost and expense. In such event, promptly after Arrowhead's notice to Horizon that it does not elect to enforce such Arrowhead Platform Patent, the Parties shall meet to discuss in good faith the strategy for enforcing such Arrowhead Platform Patent. In addition, Horizon shall provide Arrowhead with drafts of all material papers to be filed with the court and shall consider all reasonable comments thereto by Arrowhead before filing such papers. Arrowhead shall be entitled to separate representation in such matter by counsel of its own choice and at its own expense.

(iii) **Cooperation.** If a Party brings any suit, action or proceeding under Section 9.3(b), the non-enforcing Party shall agree to be joined as party plaintiff if required for the enforcing Party to bring any such suit, action or proceeding. The non-enforcing Party will provide reasonable assistance to the enforcing Party, including by providing access to relevant documents and other evidence and making its employees available, subject to the enforcing Party's reimbursement of any out-of-pocket expenses incurred by the non-enforcing Party in providing such assistance. The enforcing Party shall not enter into any settlement or compromise of any suit, action or proceeding pursuant to Section 9.3(b), (i) in a manner that would diminish the rights or interests of the non-enforcing Party or admit the invalidity or unenforceability of any Patent Controlled by the non-enforcing Party without the prior written consent of the non-enforcing Party, such consent not to be unreasonably withheld; or (ii) that would impose any cost or liability on the non-enforcing Party, without the non-enforcing's Party's prior written consent, at the non-enforcing Party's sole discretion.

(iv) **Expenses and Recoveries.** The enforcing Party bringing a claim, suit or action under this Section 9.3(b) shall be solely responsible for any expenses incurred by such Party as a result of such claim, suit or action. If such Party recovers monetary damages in such claim, suit or action, such recovery shall first be allocated to the reimbursement of any expenses incurred by the Parties in such litigation (including, for this purpose, a reasonable allocation of expenses of internal counsel). If such recovery is insufficient to cover all such costs and expenses of both Parties, it shall be shared in proportion to the total of such costs and expenses incurred by each Party. If after such reimbursement any amounts remain from such damages or other sums recovered, such remaining amounts shall be [***].

(v) **Settlement.** Neither Party shall settle any claim, suit or action that it brought under Section 9.3(b) without the prior written consent of the other Party, not to be unreasonably withheld, delayed, or conditioned. Nothing in this Article 9 shall require such other Party to consent to any settlement that is reasonably anticipated by such other Party to have material and adverse impact upon any Arrowhead Patents or Joint Patents

(c) **Infringement Other Than a Product Infringement.** For any and all infringement of any of Arrowhead Background Patent or Program Patent other than a Product Infringement, (i) Horizon shall have the sole and exclusive right to bring an appropriate suit or other action against any person or entity engaged in such other infringement of any Sole Program Patent owned by Horizon, in its sole discretion, and shall bear all related expenses and retain all related recoveries, (ii) Arrowhead shall have the sole and exclusive right to bring an appropriate suit or other action against any person or entity engaged in such other infringement of any Arrowhead Patent or Sole Program Patent owned by Arrowhead, in its sole discretion, and shall bear all related expenses and retain all related recoveries, and (iii) each Party shall have the right to bring an appropriate suit or other action against any person or entity engaged in such other infringement of a Joint Program Patent, in its sole discretion, and shall bear all related expenses and retain all related recoveries, and the other Party shall provide reasonable assistance and cooperation as set forth in Section 9.3(b)(ii), in such enforcement action, including joining such action as a party plaintiff if required by applicable Laws to pursue such action, at the request and expense of the Party bringing the suit or action.

9.4 Arrowhead Background Patents Licensed from Third Parties. Each Party's rights under this Article 9 with respect to the Prosecution and Maintenance and enforcement of any Arrowhead Background Patent that is licensed by Arrowhead from a Third Party shall be subject to the rights of such Third Party to prosecute, maintain and enforce such Patent.

9.5 Infringement of Third Party Rights. If any Compound or Product used or sold by Horizon, its Affiliates or Sublicensees becomes the subject of a Third Party's claim or assertion of infringement of a Patent within the Territory, Horizon shall promptly notify Arrowhead and the Parties shall agree on and enter into a "common interest agreement" wherein the Parties agree to their shared, mutual interest in the outcome of such potential dispute, and thereafter, the Parties shall promptly meet to consider the claim or assertion and the appropriate course of action. Horizon shall be solely responsible for the defense of any such infringement claims, provided that Horizon shall provide to Arrowhead the ability to join such action, at Arrowhead's request and expense, to pursue such action in which a patent asserted by a Third Party under this Section 9.5, claims (a) the composition of matter or use, sale, offer for sale, or importation in the Field of any Compound or Product or (b) the manufacture of any such Compound or Product using the process employed by Arrowhead as of the Effective Date (any such patent, "**Subject Patent**"). To the extent directly related to the Subject Patent, Horizon shall keep Arrowhead regularly informed of the status and progress of any action to the extent involving a Subject Patent, shall reasonably consider Arrowhead's comments on any such action with respect to such Subject Patent, including determination of litigation strategy and filing of material papers to the competent court. In addition, Horizon shall provide Arrowhead with drafts of all material papers to be filed with the court to the extent directly related to the Subject Patent and shall in good faith incorporate all reasonable comments thereto by Arrowhead before filing such papers.

9.6 Patent Term Extension. In the event Horizon desires to seek a patent term extension (including any pediatric exclusivity extensions as may be available) or supplemental protection certificate or their equivalents in any country for any Arrowhead Patent or Program Patent, then the Parties shall meet and discuss such request in good faith, provided that Horizon shall have the final decision-making authority with respect thereto.

9.7 Regulatory Data Protection. To the extent required by or permitted by Law, Horizon will, at its sole discretion, decide whether to list with the applicable Regulatory Authorities during the Term any applicable Arrowhead Patent or Program Patent claiming any Compound or Product that Horizon intends to, or has begun to, Commercialize, and that has become the subject of a Regulatory Approval Application submitted to the FDA. Such listings may include all so called “Orange Book” listings required under the Hatch-Waxman Act or listing of Patents as provided in the patent dispute resolution procedures of the Biologics Price Competition and Innovation Act of 2009 or under 42 U.S.C. § 262(l) or similar provisions in the Territory during the Term. Prior to such decision on listings, the Parties will meet to evaluate and identify any applicable Arrowhead Patent or Program Patent to be listed and Horizon shall reasonably incorporate and address suggestions provided by Arrowhead as to the listing or non-listing of any such applicable Patents.

**ARTICLE 10
REPRESENTATIONS AND WARRANTIES; COVENANTS; DISCLAIMERS**

10.1 Mutual Representations and Warranties. Each Party hereby represents and warrants to the other Party as follows:

(a) as of the Effective Date, it is a corporation duly organized, validly existing, and in good standing under the Laws of the jurisdiction in which it is incorporated; and

(b) as of the Effective Date, (i) it has the corporate power and authority and the legal right to enter into this Agreement and perform its obligations hereunder; (ii) it has taken all necessary corporate action on its part required to authorize the execution and delivery of this Agreement and the performance of its obligations hereunder; and (iii) this Agreement has been duly executed and delivered on behalf of such Party, and constitutes a legal, valid, and binding obligation of such Party that is enforceable against it in accordance with its terms.

10.2 Additional Representations and Warranties of Arrowhead. Arrowhead represents and warrants to Horizon, as of the Effective Date, as follows:

(a) Arrowhead has (i) the right under the Arrowhead Licensed Technology to grant the licenses to Horizon as purported to be granted pursuant to this Agreement, (ii) sufficient legal or beneficial title in the Arrowhead Licensed Technology to grant the licenses to Horizon as purported to be granted pursuant to this Agreement, and (iii) not granted any right or license to any Third Party under the Arrowhead Licensed Technology that would conflict or interfere with any of the rights and licenses granted to Horizon hereunder;

(b) Arrowhead owns all right, title, and interest in the Arrowhead Patents (including those set forth on **Exhibit C**) except for the Arrowhead Patents set forth on **Exhibit D**, which Patent rights Arrowhead has licensed from Third Parties pursuant to the corresponding agreements set forth on **Exhibit E** and such licensed rights are sufficient to grant the rights purported to be granted to Horizon under this Agreement;

(c) no lien, encumbrance, or security interest (including in connection with any indebtedness) exists in the Arrowhead Patents in favor of any creditor;

(d) (i) all existing agreements between Arrowhead and any Third Party under which Arrowhead receives a license under any intellectual property rights relating to the Arrowhead Licensed Technology are listed in **Exhibit E**, (ii) such agreements were made available to Horizon by Arrowhead, and were true, accurate and complete copies of such agreements, and have not been modified, supplemented or amended since the date they were made available to Horizon; (iii) each of such agreements is in full force and effect; and (iv) Arrowhead is not in material breach of any such agreements, and, to its Knowledge, no other party to any such agreements is in material breach thereof, in each respect, in any manner that would give such other party the right to terminate such agreements;

(e) no written communications have been received by Arrowhead from any Third Parties that allege, and there is no pending or threatened litigation as of the Effective Date that alleges, either

(i) that any Arrowhead Patent in existence as of the Effective Date is, or for any patent application included in the Arrowhead Patents in existence as of the Effective Date, if issued, would be, invalid or unenforceable or the use of Arrowhead Licensed Technology or the manufacture, use, sale, offer for sale or importation of the Compounds, Products or products made using Arrowhead Licensed Technology infringes or misappropriates or would infringe or misappropriate any right of any Third Party, and, to the Knowledge of Arrowhead, no Third Party (i) is infringing any Arrowhead Patents in existence as of the Effective Date or has misappropriated any Arrowhead Know-How in the Arrowhead Licensed Technology or (ii) has challenged the ownership, scope, duration, validity, enforceability, priority or right to use any Arrowhead Patents in existence as of the Effective Date (including, by way of example, through the institution of or written threat of institution of interference, reexamination, protest, opposition, derivation, nullity or similar invalidity proceeding before the U.S. Patent and Trademark Office or any analogous foreign entity) or any Arrowhead Know-How in existence as of the Effective Date;

(f) each of the issued Patents, and any currently pending Patent application or Patent application from which any such Patent has issued, in each case within the Arrowhead Patents in existence as of the Effective Date, (i) has been prosecuted in compliance with all applicable rules, policies, and procedures of the U.S. Patent and Trademark Office in all material respects, and (ii) is subsisting;

(g) Arrowhead has disclosed to Horizon all Third Party issued Patents identified as relevant by counsel to Arrowhead in any freedom to operate or patentability searches or opinions relating to the Arrowhead Licensed Technology in existence as of the Effective Date in the Territory;

(h) all of Arrowhead's and its Affiliates' employees and officers involved in development of the Licensed Technology have been obligated to assign to Arrowhead or such Affiliate, as the case may be, all inventions claimed in the Patents in such Arrowhead Licensed Technology and to maintain as confidential the Confidential Information of Arrowhead or such Affiliate, as the case may be;

(i) all inventors of any inventions included within the Arrowhead Patents owned by Arrowhead have assigned their entire right, title, and interest in and to such inventions and the corresponding Patents to Arrowhead and have been listed in such Patents as inventors;

(j) neither the execution and delivery of this Agreement nor the performance hereof by Arrowhead requires Arrowhead to obtain any permits, authorizations or consents from any Governmental Authority or from any other person, firm or corporation, and such execution, delivery and performance will not result in the breach of or give rise to any right of termination, rescission, renegotiation or acceleration under, or trigger any other rights under, any agreement or contract to which Arrowhead is a party or to which it may be subject that relates to the Arrowhead Licensed Technology;

(k) there are no pending actions, claims, investigations, suits or proceedings against Arrowhead or its Affiliates, at law or in equity, or before or by any Governmental Authority, and neither Arrowhead nor any Affiliate has received any written notice regarding any pending or threatened actions, claims, investigations, suits or proceedings against Arrowhead or such Affiliate, at law or in equity, or before or by any Governmental Authority, in either case with respect to the Arrowhead Licensed Technology;

(l) Arrowhead Licensed Technology has not been created or developed using government funding that grants rights to step-in, seize, restrict or otherwise compromise the ability of Arrowhead to use such technology or to grant to Horizon the rights purported to be granted hereunder;

(m) Arrowhead has provided to Horizon all material discovery, research and preclinical data related to Arrowhead's program against the Collaboration Target; and

(n) to Arrowhead's Knowledge, there are no Regulatory Materials or other Information that would adversely affect (i) the conduct of the Research Program, or (ii) the Development, Manufacture or Commercialization of Compounds and Products in the Field in the Territory.

(o) [***].

10.3 Mutual Covenants.

(a) **No Debarment.** In the course of the Development of Compounds and Products, each Party shall not knowingly use any employee or consultant who has ever been debarred or is the subject of debarment or convicted of a crime for which an entity or person could be debarred (including by the FDA under 21 U.S.C. § 335a (or subject to a similar sanction of any other Governmental Authority)). Each Party shall notify the other Party promptly upon becoming aware that any of its employees or consultants has been debarred or is the subject of debarment proceedings by any Regulatory Authority.

(b) **Compliance.** Each Party and its Affiliates shall comply in all material respects with all applicable Laws in the Development, Manufacture, and Commercialization of Compounds and Products performed under this Agreement, including the statutes, regulations and

written directives of the FDA, the EMA and any Regulatory Authority having jurisdiction in the Territory, the FD&C Act, the Prescription Drug Marketing Act, the Federal Health Care Programs Anti-Kickback Law, 42 U.S.C. § 1320a-7b(b), the statutes, regulations and written directives of Medicare, Medicaid and all other health care programs, as defined in 42 U.S.C. § 1320a-7b(f), and the Foreign Corrupt Practices Act of 1977, each as may be amended from time to time.

10.4 Additional Covenants.

(a) Arrowhead represents and warrants to and covenants with Horizon that all of Arrowhead's employees and officers involved in research and development of the Arrowhead Licensed Technology, Compounds, or Products shall be obligated to assign to Arrowhead all inventions relating to such Arrowhead Licensed Technology, Compounds, or Products and to maintain as confidential the Confidential Information of Arrowhead;

(b) Horizon represents and warrants to and covenants with Arrowhead that all of Horizon's employees and officers involved in Development of the Compounds or the Product shall be obligated to assign to Horizon all inventions relating to such Compounds or the Product and to maintain as confidential the Confidential Information of Horizon;

(c) Arrowhead represents and warrants to and covenants with Horizon that Arrowhead shall not sell, assign, or otherwise transfer to any person (other than any Affiliate of Arrowhead) any Arrowhead Patents (or agree to do any of the foregoing) in any manner that would be inconsistent with the rights and licenses granted to Horizon under this Agreement, except to the extent permitted by, and in compliance with, Section 15.6; and

(d) Arrowhead represents and warrants to and covenants with Horizon that Arrowhead shall not grant to any Third Party any right or license under the Arrowhead Licensed Technology that is within the scope of licenses granted to Horizon under Section 3.1(a) or Section 3.2

(e) Arrowhead covenants that [***].

10.5 Disclaimer. EXCEPT AS EXPRESSLY STATED IN THIS AGREEMENT, NO REPRESENTATIONS OR WARRANTIES WHATSOEVER, WHETHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, OR NON-MISAPPROPRIATION OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS, ARE MADE OR GIVEN BY OR ON BEHALF OF A PARTY, AND ALL REPRESENTATIONS AND WARRANTIES, WHETHER ARISING BY OPERATION OF LAW OR OTHERWISE, ARE HEREBY EXPRESSLY EXCLUDED. Without limiting the generality of the foregoing, (a) neither Party represents or warrants as to the success of any study or test conducted by such Party pursuant to this Agreement or the safety or usefulness for any purpose of the technology, right or materials it provides hereunder, or that either Party will be successful in obtaining any patent rights, or that any patents will issue based on a pending application; and (b) each Party specifically disclaims any guarantee that the Compounds or Products will be successful, in whole or in part.

ARTICLE 11 INDEMNIFICATION

11.1 Indemnification by Arrowhead. Arrowhead shall defend, indemnify, and hold Horizon and its Affiliates and their respective officers, directors, employees, and agents (the “**Horizon Indemnitees**”) harmless from and against any and all Third Party claims, suits, proceedings, damages, expenses (including court costs and reasonable attorneys’ fees and expenses) and recoveries (collectively, “**Claims**”) to the extent that such Claims arise out of, are based on, or result from (a) the performance by or on behalf of Arrowhead or its Affiliates or licensees of Arrowhead’s obligations under this Agreement or the development, manufacture, or commercialization by Arrowhead, its Affiliates or licensees (other than Horizon, its Affiliates or Sublicensees) of products containing RNAi Molecules solely to the extent such Claim is based on the use of the Arrowhead Licensed Technology by Arrowhead, its Affiliates or licensees (other than Horizon, its Affiliates or Sublicensees) in connection with such development, manufacture or commercialization by such parties of such products, (b) the breach of any of Arrowhead’s obligations under this Agreement, including Arrowhead’s representations, warranties, and covenants set forth herein, or (c) the willful misconduct or negligence of Arrowhead or its Affiliates in performing under this Agreement. The foregoing indemnity obligation shall not apply to the extent that (i) the Horizon Indemnitees fail to comply with the indemnification procedures set forth in Section 11.3 and Arrowhead’s defense of the relevant Claims is actually prejudiced by such failure, or (ii) any Claim arises from, is based on, or results from any act or omission for which Horizon is obligated to indemnify the Arrowhead Indemnitees under Section 11.2.

11.2 Indemnification by Horizon. Horizon shall defend, indemnify, and hold Arrowhead and its Affiliates and their respective officers, directors, employees, and agents (the “**Arrowhead Indemnitees**”) harmless from and against any and all Claims to the extent that such Claims arise out of, are based on, or result from (a) the Development, Manufacture or Commercialization of Compounds or Products by or on behalf of Horizon or its Affiliates or Sublicensees, including Claims based upon product liability and patent infringement, (b) the breach of any of Horizon’s obligations under this Agreement, including Horizon’s representations, warranties, and covenants set forth herein, or (c) the willful misconduct or negligence of Horizon or its Affiliates in performing under this Agreement. The foregoing indemnity obligation shall not apply to the extent that (i) the Arrowhead Indemnitees fail to comply with the indemnification procedures set forth in Section 11.3 and Horizon’s defense of the relevant Claims is actually prejudiced by such failure, or (ii) any Claim arises from, is based on, or results from any act or omission for which Arrowhead is obligated to indemnify the Horizon Indemnitees under Section 11.1.

11.3 Indemnification Procedures. The Party claiming indemnity under this Article 11 (the “**Indemnified Party**”) shall give written notice to the Party from whom indemnity is being sought (the “**Indemnifying Party**”) promptly after learning of such Claim. The Indemnified Party shall provide the Indemnifying Party with reasonable assistance, at the Indemnifying Party’s expense, in connection with the defense of the Claim for which indemnity is being sought and, if the Indemnifying Party has failed to assume defense of such Claim and the Indemnified Party has assumed and is conducting the defense of the Claim, the Indemnifying Party shall provide the Indemnified Party with reasonable assistance, at the Indemnifying Party’s expense, in connection

with the defense of the Claim for which the indemnity is being sought. The Indemnified Party may participate in and monitor such defense with counsel of its own choosing at its sole expense; provided, however, the Indemnifying Party shall have the right to assume and conduct the defense of the Claim with counsel of its choice. The Indemnifying Party shall not settle any Claim without the prior written consent of the Indemnified Party, not to be unreasonably withheld, conditioned or delayed. For clarity, the Indemnified Party may freely withhold its consent to a settlement of a claim with respect to Claims if (a) such settlement does not include a complete release from liability of the Indemnified Party or if such settlement would involve undertaking an obligation (including the payment of money by an Indemnified Party), (b) would bind or impair the Indemnified Party or (c) includes any admission of wrongdoing or that any intellectual property or proprietary right of the Indemnified Party or this Agreement is invalid, narrowed in scope or unenforceable. So long as the Indemnifying Party is actively defending the Claim in good faith, the Indemnified Party shall not settle or compromise any such Claim without the prior written consent of the Indemnifying Party. If the Indemnifying Party does not assume and conduct the defense of the Claim as provided above, (i) the Indemnified Party may defend against, consent to the entry of any judgment, or enter into any settlement with respect to such Claim in any manner the Indemnified Party may deem reasonably appropriate (and the Indemnified Party need not consult with, or obtain any consent from, the Indemnifying Party in connection therewith), and (ii) the Indemnifying Party shall remain responsible to indemnify the Indemnified Party as provided in this Article 11.

11.4 Limitation of Liability. EXCEPT WITH RESPECT TO ANY DAMAGES AVAILABLE FOR A PARTY'S BREACH OF CONFIDENTIALITY OBLIGATIONS IN ARTICLE 12 OR ITS OBLIGATIONS IN SECTION 3.6, AND WITHOUT LIMITING OR RESTRICTING THE INDEMNIFICATION RIGHTS OR OBLIGATIONS OF ANY PARTY UNDER SECTION 11.1 OR 11.2, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, PUNITIVE, OR INDIRECT DAMAGES ARISING FROM OR RELATING TO ANY BREACH OF THIS AGREEMENT, REGARDLESS OF ANY NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

11.5 Insurance. Each Party shall procure and maintain insurance adequate to cover its obligations hereunder during the Term and consistent with normal business practices of companies similarly situated. It is understood that such insurance shall not be construed to create a limit of either Party's liability with respect to its indemnification obligations under this Article 11. Each Party shall provide the other Party with written evidence of such insurance upon request.

ARTICLE 12 CONFIDENTIALITY

12.1 Confidentiality. Each Party agrees that, during the Term and for a period of [***] years thereafter, it shall keep confidential and shall not publish or otherwise disclose and shall not use for any purpose other than as provided for in this Agreement (which includes the exercise of any rights or the performance of any obligations hereunder) any Confidential Information furnished to it by the other Party pursuant to this Agreement, except to the extent expressly authorized by this Agreement or otherwise agreed in writing by the Parties. Each Party will use at least the same standard of care as it uses to protect proprietary or confidential information of its

own (but no less than reasonable care) to ensure that its employees, agents, consultants, contractors and other representatives do not disclose or make any unauthorized use of the Confidential Information of the other Party. Each Party will promptly notify the other upon discovery of any unauthorized use or disclosure of the Confidential Information of the other Party. The foregoing confidentiality and non-use obligations shall not apply to any portion of the other Party's Confidential Information that the receiving Party can demonstrate by competent written proof:

(a) was already known to the receiving Party or any of its Affiliates, other than by previous confidential disclosure of the disclosing Party or any of its Affiliates, at the time of disclosure by the other Party;

(b) was generally available to the public or otherwise part of the public domain at the time of its disclosure to the receiving Party;

(c) becomes generally available to the public or otherwise part of the public domain after its disclosure and other than through any act or omission of the receiving Party in breach of this Agreement;

(d) was disclosed to the receiving Party or any of its Affiliates on a non- confidential basis by a Third Party who is not known by the receiving Party after due inquiry to be subject to an obligation of confidentiality to the other Party; or

(e) was independently discovered or developed by the employees, subcontractors, consultants or agents of the receiving Party or any of its Affiliates without use of the other Party's Confidential Information, as evidenced by a contemporaneous writing.

12.2 Authorized Disclosure. Notwithstanding the obligations set forth in Section 12.1, a Party may disclose the other Party's Confidential Information and the terms of this Agreement to the extent:

(a) such disclosure is reasonably necessary (i) to comply with the requirements of Regulatory Authorities with respect to obtaining and maintaining Regulatory Approval of a Product; or (ii) for prosecuting or defending litigation as contemplated by this Agreement;

(b) such disclosure is reasonably necessary to its employees, agents, consultants, contractors, licensees or sublicensees on a need-to-know basis for the sole purpose of performing its obligations or exercising its rights under this Agreement; provided that in each case, the disclosees are bound by written obligations of confidentiality and non-use consistent with those contained in this Agreement;

(c) such disclosure is reasonably necessary to any bona fide potential or actual investor, acquirer, merger partner, licensee, sublicensee, or other financial or commercial partner for the sole purpose of evaluating an actual or potential investment, acquisition or other business relationship; provided that, in connection with such disclosure, such Party shall inform each disclosee of the confidential nature of such Confidential Information, and the disclosees are bound by written obligations of confidentiality and non-use consistent with those contained in this

Agreement; and provided further, that no financial terms shall be disclosed to any such potential investor, acquirer or partner if it has a Competing Program; or

(d) such disclosure is reasonably necessary to comply with applicable Laws, including regulations promulgated by applicable security exchanges, court order, administrative subpoena or order.

Notwithstanding the foregoing, in the event a Party is required to make a disclosure of the other Party's Confidential Information pursuant to Section 12.2(a) or 12.2(d), such Party shall promptly notify the other Party of such required disclosure and shall use reasonable efforts to obtain, or to assist the other Party in obtaining, a protective order preventing or limiting the required disclosure. Any information disclosed pursuant to Section 12.2(a) through Section 12.2(d) shall still be deemed Confidential Information and subject to the restrictions set forth in this Agreement, including the foregoing provisions of Article 12.

12.3 Technical Publication. During the Term, neither Party may publish peer reviewed manuscripts, or give other forms of public disclosure such as abstracts and presentations, of results of studies carried out under this Agreement, without the opportunity for prior review by the other Party and subject to this Section 12.3, except to the extent required by applicable Laws; provided that, Horizon will have the sole right (without Arrowhead's consent) to publish and make scientific presentations with respect to Compounds or Products or make other public disclosures regarding any such Compounds or Products, and Arrowhead will not do so without Horizon's prior written consent, except as required by applicable Law. No publication shall include the other Party's Confidential Information without the prior written consent of such other Party. A Party seeking publication shall provide the other Party the opportunity to review and comment on any proposed publication (or where a copy of such publication or presentation is not available at such time, a draft or outline of such publication or description of such presentation) that relates to an RNAi Molecule directed to the Collaboration Target or any Compound or Product, at least [***] days prior to its intended submission for publication. The other Party shall provide the Party seeking publication with its comments in writing, if any, as promptly as practicable after receipt of such proposed publication. The Party seeking publication shall consider in good faith any comments thereto provided by the other Party and shall comply with the other Party's request to remove any and all of such other Party's Confidential Information from the proposed publication. In addition, the Party seeking publication shall delay the submission for a period up to [***] days in the event that the other Party can demonstrate reasonable need for such delay, including the preparation and filing of a patent application (or, in the case that a Party has a compelling business justification, for a longer period reasonably selected by that Party). Each Party agrees to acknowledge the contributions of the other Party and its employees in all publications as scientifically appropriate.

12.4 Publicity; Terms of this Agreement.

(a) The Parties agree that the terms of this Agreement are the Confidential Information of both Parties, subject to disclosure authorized in this Article 12 and the special authorized disclosure provisions set forth in this Section 12.4.

(b) Public announcement of the execution of this Agreement shall be made substantially in the form of the press release attached hereto as Exhibit F, on or promptly after the Effective Date.

(c) After release of such press release, if either Party desires to make a public announcement concerning the terms of this Agreement, such Party shall give reasonable prior advance notice of the proposed text of such announcement to the other Party for its prior review and approval (except as otherwise provided herein). A Party commenting on such a proposed press release shall provide its comments, if any, within [***] days after receiving the press release for review. Notwithstanding the foregoing, a Party shall have the right to make a public announcement or press release announcing the achievement of each Regulatory Approval development and regulatory milestone event set forth in Section 8.2 as it is achieved either (i) with the consent of the other Party, not to be unreasonably withheld; (ii) where required by applicable Laws or regulations promulgated by an applicable security exchange; or (iii) as permitted under Section 12.2. Except as provided in this subsection (c) or permitted under Section 12.2, no press release shall include the other Party's Confidential Information without the prior written consent of such other Party. In relation to the other Party's review of such an announcement, such other Party may make specific, reasonable comments on such proposed press release within the prescribed time for commentary. Neither Party shall be required to seek the permission of the other Party to repeat any information regarding the terms of this Agreement that has already been publicly disclosed by such Party, or by the other Party, in accordance with this Section 12.4, provided such information remains accurate as of such time.

(d) The Parties acknowledge that either or both Parties may be obligated to file a copy of this Agreement and summaries of the terms hereof with the U.S. Securities and Exchange Commission or other Governmental Authority as reasonably required to comply with applicable Laws or the rules of a nationally-recognized securities exchange. Each Party shall be entitled to make such filings, provided that it requests confidential treatment of the commercial terms, sensitive technical terms and other terms of this Agreement that a Party reasonably deems sensitive or competitive to the extent such confidential treatment is reasonably available to such Party; provided that the foregoing obligation to request confidential treatment shall not apply with respect to any disclosure of this Agreement by either Party to the U.S. Internal Revenue Service or similar Governmental Authority outside the U.S. In the event of any such filing, each Party will provide the other Party with a copy of this Agreement and related filings marked to show provisions for which such Party intends to seek confidential treatment and shall reasonably consider and incorporate the other Party's comments thereon to the extent consistent with the legal requirements and the rules of any nationally recognized securities exchange, with respect to the filing Party, governing disclosure of material agreements and material information to be publicly filed.

12.5 Equitable Relief. Each Party acknowledges that its breach of this Article 12 would cause irreparable harm to the other Party, which cannot be reasonably or adequately compensated in damages in an action at law. By reasons thereof, each Party agrees that the other Party shall be entitled, in addition to any other remedies it may have under this Agreement or otherwise, to preliminary and permanent injunctive and other equitable relief to prevent or curtail any actual or threatened breach of the obligations relating to Confidential Information set forth in this Article 12 by the other Party.

12.6 Attorney-Client Privilege. Neither Party is waiving, nor will be deemed to have waived or diminished, any of its attorney work product protections, attorney-client privileges or similar protections and privileges recognized under the applicable law of any jurisdiction as a result of disclosing information pursuant to this Agreement, or any of its Confidential Information (including Confidential Information related to pending or threatened litigation) to the receiving Party, regardless of whether the disclosing Party has asserted, or is or may be entitled to assert, such privileges and protections. The Parties may become joint defendants in proceedings to which the information covered by such protections and privileges relates and may determine that they share a common legal interest in disclosure between them that is subject to such privileges and protections, and in such event, may enter into a joint defense agreement setting forth, among other things, the foregoing principles, but are not obligated to do so.

ARTICLE 13 TERM AND TERMINATION

13.1 Term. This Agreement shall become effective on the Effective Date and, unless earlier terminated pursuant to this Article 13, shall remain in effect until expiration of the Royalty Term for all Products in the Territory (the “**Term**”). After the expiration of the Royalty Term for a Product in a given country, Horizon shall have a fully paid-up, irrevocable, freely transferable and sublicensable license in such country under the relevant Arrowhead Licensed Technology to make, have made, use, sell, offer for sale, import and otherwise exploit such Product for any and all uses, which shall survive any expiration or termination of this Agreement.

13.2 Termination for Convenience. Horizon may terminate this Agreement in its entirety at any time and for any reason or for no reason upon delivery of (a) at least [***] days’ prior written notice to Arrowhead if no First Commercial Sale has occurred with respect to a Product and (b) at least [***] days’ prior written notice to Arrowhead if First Commercial Sale has occurred with respect to a Product.

13.3 Termination for Breach. Each Party (the “**Non-Breaching Party**”) shall have the right, without prejudice to any other remedies available to it at law or in equity, to terminate this Agreement in its entirety upon written notice to the other Party if the other Party materially breaches its obligations under this Agreement and, after receiving written notice identifying such material breach in reasonable detail, fails to cure such material breach, or if such material breach is not susceptible to cure within the Cure Period, fails to deliver to the Non-Breaching Party a written plan that is reasonably calculated to resolve such material breach, within [***] days from the date of such notice (or within [***] days from the date of such notice in the event such material breach is solely based on the breaching Party’s failure to pay any undisputed amounts due hereunder) (the “**Cure Period**”). If the Parties reasonably and in good faith disagree as to whether there has been a material breach, the Party that disputes that there has been a material breach may contest the allegation in accordance with Article 14. It is understood and acknowledged that, during the pendency of such a Dispute, the Cure Period shall be extended by the period of time of such pendency, all of the terms and conditions of this Agreement shall remain in effect, and the Parties shall continue to perform all of their respective obligations under this Agreement; provided that for any Dispute over payment, such tolling of the Cure Period will only apply with respect to payment of the disputed amounts and not with respect to any undisputed amounts.

13.4 Consequences of Termination. Upon any termination of this Agreement pursuant to Section 13.2 or 13.3, except as otherwise set forth in Section 13.5, all licenses and rights granted by either Party under this Agreement shall terminate. In addition, if this Agreement is terminated because (a) the Research Plan is determined to be futile based upon the relevant criteria in the Research Plan, or (b) Horizon has identified a material issue with freedom to operate that would be reasonably expected to interfere with or limit further development or commercialization of the lead candidate, and Arrowhead does not conduct activities for a back-up candidate as described in the Research Plan, then during the two (2) year period immediately following such termination, Arrowhead shall not, itself or with or through any Affiliate or Third Party, conduct or participate in, or advise, assist, license, sublicense or enable any Third Party to conduct or participate in, the research, development, manufacture or commercialization of any pharmaceutical product containing or comprising any RNAi Molecule designed to inhibit or modulate the expression of the Collaboration Target.

13.5 Survival. Termination or expiration of this Agreement shall not affect any liabilities of the Parties under this Agreement that have accrued prior to the date of termination or expiration. Notwithstanding anything to the contrary, the following provisions shall survive any expiration or termination of this Agreement: Article 1, Article 12, Article 14 and Article 15; and Sections 3.3(a)(iv), 8.8 (for the period specified therein), 9.1, 10.5, 11.1, 11.2, 11.3, 11.4, 13.4, 13.5 and 13.6.

13.6 No Limitation on Remedies. Notwithstanding anything to the contrary in this Agreement, termination or expiration of this Agreement shall not relieve the Parties of any liability or obligation which accrued hereunder prior to the effective date of such termination or expiration nor prejudice either Party's right to obtain performance of any obligation. Subject to the terms and conditions of this Agreement, each Party shall be free to seek (without restriction as to the number of times it may seek) damages, costs and remedies that may be available at Law or in equity and shall be entitled to offset the amount of any damages and costs obtained in a final, non-appealable judgment (or judgment from which no appeal was taken within the allowable time period) of monetary damages or costs (as permitted by this Agreement) against the other Party against any amounts otherwise due to such other Party under this Agreement.

ARTICLE 14 DISPUTE RESOLUTION

14.1 Disputes. The Parties recognize that controversies or claims arising out of, relating to or in connection with any provision of this Agreement as to certain matters may from time to time arise that relate to either Party's rights or obligations hereunder (collectively, "**Disputes**"). It is the objective of the Parties to establish procedures to facilitate the resolution of Disputes in an expedient manner by mutual cooperation. In the event of a Dispute, other than a Dispute subject to Section 14.5, either Party may refer the matter to the Parties' Executive Officers for attempted resolution. The Executive Officers, in the presence of their legal advisors, shall attempt in good faith to resolve any Dispute through negotiations. If the Executive Officers are unable to resolve a Dispute referred to them within [***] (or such other period as may be agreed by the Parties in writing) after such referral, and subject to any other provisions of this Agreement, such Dispute shall be resolved as provided below in this Article.

14.2 Arbitration. If the Executive Officers are unable to resolve a Dispute referred to them pursuant to Section 14.1 within [***] (or such other period as may be agreed by the Parties in writing) after such referral, and a Party desires to pursue resolution of a Dispute, then the Dispute shall be submitted by either Party for resolution in arbitration pursuant to the then current CPR Non-Administered Arbitration Rules (“**CPR Rules**”) (www.cpradr.org), except where they conflict with these provisions, in which case these provisions control.

(a) The arbitration will be held in New York, New York. All aspects of the arbitration shall be treated as confidential.

(b) The arbitrators will be chosen from the CPR Panel of Distinguished Neutrals, unless a candidate not on such panel is approved by both Parties. Each arbitrator shall be [***]. To the extent that the Dispute requires special expertise, the Parties will so inform CPR prior to the beginning of the selection process.

(c) The arbitration tribunal shall consist of three arbitrators, of whom each Party shall designate one in accordance with the "screened" appointment procedure provided in CPR Rule 5.4. The chair will be chosen in accordance with CPR Rule 6.4. If, however, the aggregate award sought by the Parties is less than \$5 million and equitable relief is not sought, a single arbitrator shall be chosen in accordance with the CPR Rules.

(d) Candidates for the arbitrator position(s) may be interviewed by representatives of the Parties in advance of their selection, provided that all Parties are represented.

(e) The Parties agree to select the arbitrator(s) within [***] days of initiation of the arbitration. The hearing will be concluded within [***] months after selection of the arbitrator(s) and the award will be rendered within [***]. In the event the Parties cannot agree upon a schedule, then the arbitrator(s) shall set the schedule following the time limits set forth above as closely as practical.

(f) The Parties shall have the right to conduct and enforce pre-hearing discovery in accordance with the then current Federal Rules of Civil Procedure, unless otherwise agreed by the Parties in writing. All discovery conducted pursuant to the arbitration proceedings will be subject to the then current Federal Rules of Civil Procedure, unless otherwise agreed by the Parties in writing.

(g) The hearing will be concluded in [***] days or less. Multiple hearing days will be scheduled consecutively to the greatest extent possible. A transcript of the testimony adduced at the hearing shall be made and shall be made available to each Party.

(h) The arbitrator(s) shall decide the merits of any Dispute in accordance with the law of the State of New York, without application of any principle of conflict of laws that would result in reference to a different law. The arbitrator(s) may not apply principles such as “amiable compositeur” or “natural justice and equity.”

(i) The arbitrator(s) are expressly empowered to decide dispositive motions in advance of any hearing and shall endeavor to decide such motions as would a United States District Court Judge sitting in the jurisdiction whose substantive law governs.

(j) The arbitrator(s) shall render a written opinion stating the reasons upon which the award is based. The Parties consent to the jurisdiction of the United States District Court for the district in which the arbitration is held for the enforcement of these provisions and the entry of judgment on any award rendered hereunder. Should such court for any reason lack jurisdiction, any court with jurisdiction may act in the same fashion.

(k) Each Party has the right to seek from the appropriate court provisional remedies such as attachment, preliminary injunction, replevin, etc. to avoid irreparable harm, maintain the status quo, or preserve the subject matter of the Dispute. Rule 14 of the CPR Rules does not apply to this Agreement.

(l) EACH PARTY HERETO WAIVES: ITS RIGHT TO TRIAL BY JURY OF ANY ISSUE UNDERLYING A DISPUTE WITHIN THE SCOPE OF THIS SECTION 14.2; AND, WITH THE EXCEPTION OF RELIEF MANDATED BY STATUTE, ANY CLAIM FOR PUNITIVE, EXEMPLARY, MULTIPLIED, INDIRECT, OR CONSEQUENTIAL DAMAGES OR ATTORNEY FEES.

14.3 Preliminary Injunctions. Notwithstanding anything in this Agreement to the contrary, a Party may, at any time, seek a temporary restraining order or a preliminary injunction from any court of competent jurisdiction in order to prevent immediate and irreparable injury, loss, or damage on a provisional basis.

14.4 Consent to Jurisdiction. Each Party, for the purpose of enforcing an award under Section 14.2 or for seeking interim or provisional relief as contemplated in Section 14.3 with respect to any Disputed breach of this Agreement, agrees not to raise any objection at any time to the laying or maintaining of the venue of any action, suit or proceeding for such purpose in any state or federal Court sitting in New York, irrevocably waives any claim that such action, suit or other proceeding has been brought in an inconvenient forum, and further irrevocably waives the right to object, with respect to such action, suit or other proceeding, that such Court does not have any jurisdiction over such Party. Each Party further agrees that service of any process, summons, notice or document by registered mail to such Party's notice address provided for in this Agreement shall be effective service of process for any action, suit or proceeding in the Court with respect to any matters to which it has submitted to jurisdiction in this Section 14.4.

14.5 Patent Disputes. Notwithstanding anything in this Agreement to the contrary, any and all issues regarding the validity and enforceability of any patent in a country within the Territory shall be determined in a court or other tribunal, as the case may be, of competent jurisdiction under the applicable patent laws of such country, except as to any issue that depends on the validity, scope or enforceability of any Joint Program IP, which shall be determined in accordance with U.S. federal law.

existing prior to such Change of Control) shall be excluded from the licenses granted to Horizon under this Agreement and the Arrowhead Licensed Technology owned or otherwise Controlled by such Acquiror, except that any Information or Patents used or generated by the Acquiror or its Affiliates in performing any activity under this Agreement shall be included in the licenses granted to Horizon under this Agreement and the Arrowhead Licensed Technology.

15.7 Further Actions. Each Party agrees to execute, acknowledge and deliver such further instruments, and to do all such other acts, as may be necessary or appropriate in order to carry out the purposes and intent of this Agreement.

15.8 Rights in Bankruptcy. All rights and licenses granted under or pursuant to this Agreement by Arrowhead are, and shall otherwise be deemed to be, for purposes of Section 365(n) of the Bankruptcy Code, licenses of rights to “intellectual property” as defined under Section 101 of the Bankruptcy Code. The Parties agree that Horizon, as licensee of such rights under this Agreement, shall retain and may fully exercise all of its rights and elections under the Bankruptcy Code including without limitation Horizon’s right to retain all licenses to Arrowhead Licensed Technology granted herein. Without limiting the generality of the foregoing, the Parties intend and agree that any sale of Arrowhead’s assets under Section 363 of the Bankruptcy Code shall be subject to Horizon’s rights under Section 365(n), that Horizon cannot be compelled to accept a money satisfaction of its interests in Arrowhead Licensed Technology, and that any such sale therefore may not be made to a purchaser “free and clear” of Horizon’s license rights without the consent of Horizon. The Parties further agree that, in the event of the commencement of a bankruptcy proceeding by or against Arrowhead under the Bankruptcy Code, Horizon shall be entitled to a complete duplicate of (or complete access to, as appropriate) any such intellectual property and all embodiments of such intellectual property, and the same, if not already in its possession, shall be promptly delivered to them (i) upon any such commencement of a bankruptcy proceeding upon its written request therefor, unless Arrowhead elects to continue to perform all of its obligations under this Agreement, or (ii) if not delivered under (i) above, following the rejection of this Agreement by or on behalf of Arrowhead upon written request therefor by Horizon. (The Parties acknowledge and agree that “embodiments” of intellectual property within the meaning of Section 365(n) include without limitation laboratory notebooks, RNAi Molecules, inventory, research studies, data, and regulatory approvals). Additionally, if (a) a case under the Bankruptcy Code is commenced by or against Arrowhead, (b) this Agreement is rejected as provided in the Bankruptcy Code, and (c) Horizon elects to retain its rights hereunder as provided in Section 365(n) of the Bankruptcy Code, Arrowhead (in any capacity, including debtor-in-possession) and its successors and assigns (including a trustee) shall not interfere with Horizon’s rights under this Agreement to Arrowhead Licensed Technology (including such embodiments), including any right to obtain such Arrowhead Licensed Technology (or such embodiments) from another entity, to the extent provided in Section 365(n) of the Bankruptcy Code. All rights, powers and remedies of Horizon provided herein are in addition to and not in substitution for any and all other rights, powers and remedies now or hereafter existing at law or in equity (including the Bankruptcy Code) in the event of the commencement of a case under the Bankruptcy Code with respect to Arrowhead. The Parties agree that they intend the following rights to extend to the maximum extent permitted by law, and to be enforceable under Section 365(n) of the Bankruptcy Code: (I) the right of access to any Arrowhead Licensed Technology (including all embodiments thereof) of Arrowhead, or any Third Party with whom Arrowhead contracts to perform an obligation of Arrowhead under

this Agreement, and, in the case of the Third Party, which is necessary for the development, manufacture, supply, commercialization, sale, import or export of Compounds or Products, in any case solely as provided under this Agreement; and (II) the right to contract directly with any Third Party to complete the same

15.9 Severability. If any one or more of the provisions of this Agreement is held to be invalid or unenforceable by any court of competent jurisdiction from which no appeal can be or is taken, the provision shall be considered severed from this Agreement and shall not serve to invalidate any remaining provisions hereof. The Parties shall make a good faith effort to replace any invalid or unenforceable provision with a valid and enforceable one such that the objectives contemplated by the Parties when entering this Agreement may be realized.

15.10 No Waiver. Any delay in enforcing a Party's rights under this Agreement or any waiver as to a particular default or other matter shall not constitute a waiver of such Party's rights to the future enforcement of its rights under this Agreement, except with respect to an express written and signed waiver relating to a particular matter for a particular period of time.

15.11 Independent Contractors. Each Party shall act solely as an independent contractor, and nothing in this Agreement shall be construed to give either Party the power or authority to act for, bind, or commit the other Party in any way. Nothing herein shall be construed to create the relationship of partners, principal and agent, or joint-venture partners between the Parties. No Party shall report this Agreement (and the transactions hereunder) as an entity or partnership for any tax purpose unless required pursuant to a "final determination" in accordance with Section 1313 of the Code.

15.12 No Third Party Beneficiaries. This Agreement is neither expressly nor impliedly made for the benefit of any party other than the Parties and their successors and permitted assigns, except for the persons expressly entitled to indemnification as provided in Article 11 and only in accordance with the terms of such Article 11.

15.13 Counterparts; Electronic Delivery. This Agreement may be executed in counterparts, by original or PDF signature, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Signatures to this Agreement transmitted by email in "portable document format" (".pdf"), or by any other electronic means intended to preserve the original graphic and pictorial appearance of this Agreement shall have the same effect as physical delivery of the paper document bearing original signature.

[Signature page follows]

[***] = CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY BRACKETS, HAS BEEN OMITTED BECAUSE THE INFORMATION (I) IS NOT MATERIAL AND (II) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

IN WITNESS WHEREOF, the Parties have executed this Agreement by their duly authorized officers as of the Effective Date.

HORIZON THERAPEUTICS IRELAND DAC

ARROWHEAD PHARMACEUTICALS, INC.

By: /s/ William D. Gannon

By: /s/ Christopher Anzalone

Name: William D. Gannon

Name: Christopher Anzalone

Title: Director

Title: Chief Executive Officer

[SIGNATURE PAGE TO COLLABORATION AND LICENSE AGREEMENT]

[***] = CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY BRACKETS, HAS BEEN OMITTED BECAUSE THE INFORMATION (I) IS NOT MATERIAL AND (II) WOULD BE COMPETITIVELY HARMFUL IF PUBLICLY DISCLOSED.

LIST OF EXHIBITS:

- Exhibit A:** Collaboration Target
- Exhibit B:** Research Plan
- Exhibit C:** Arrowhead Owned Patents
- Exhibit D:** Arrowhead Licensed Patents
- Exhibit E:** Third Party License Agreements
- Exhibit F:** Initial Press Release
- Exhibit G:** [***]
- Exhibit H:** Pre-Clinical and Clinical Supply Terms
-

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EXHIBIT A

COLLABORATION TARGET

[*]**

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EXHIBIT B

RESEARCH PLAN

[*]**

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EXHIBIT C

ARROWHEAD OWNED PATENTS

[*]**

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EXHIBIT D

ARROWHEAD LICENSED PATENTS

[*]**

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EXHIBIT E

THIRD PARTY LICENSE AGREEMENTS

- Asset Purchase and Exclusive License Agreement by and between Arrowhead Research Corporation and Novartis Institute for BioMedical Research, Inc., dated March 3, 2015.
 - Non-Exclusive License Agreement between City of Hope and F. Hoffmann-La Roche Ltd. and Hoffmann-La Roche Inc., dated September 19, 2011.
 - Non-Exclusive License Agreement between Hoffmann-La Roche Inc. and F. Hoffmann-La Roche Ltd. and MDRNA, Inc., dated February 12, 2009.
-

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EXHIBIT F

INITIAL PRESS RELEASE

[See attached]

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EXHIBIT G

[*]**

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EXHIBIT H

PRE-CLINICAL AND CLINICAL SUPPLY TERMS

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Attachment 1 to Exhibit H

[*]**

CERTIFICATION PURSUANT SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Christopher Anzalone, Chief Executive Officer of Arrowhead Pharmaceuticals, Inc., certify that:

1. I have reviewed this Quarterly Report on Form 10-Q 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: August 5, 2021

/s/ CHRISTOPHER ANZALONE

Christopher Anzalone
Chief Executive Officer

CERTIFICATION PURSUANT SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Kenneth A. Myszkowski, Chief Financial Officer of Arrowhead Pharmaceuticals, Inc., certify that:

1. I have reviewed this Quarterly Report on Form 10-Q 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: August 5, 2021

/s/ Kenneth A. Myszkowski

Kenneth A. Myszkowski,
Chief Financial Officer

CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

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 Quarterly Report on Form 10-Q of the Company for the quarterly period ended June 30, 2021, 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 Quarterly Report on Form 10-Q fairly presents in all material respects the financial condition and results of operations of the Company.

Date: August 5, 2021

/s/ CHRISTOPHER ANZALONE

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.

CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

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 Quarterly Report on Form 10-Q of the Company for the quarterly period ended June 30, 2021, 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 Quarterly Report on Form 10-Q fairly presents in all material respects the financial condition and results of operations of the Company.

Date: August 5, 2021

/s/ Kenneth A. Myszkowski

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.