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 March 31, 2020

☐ **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	**46-0408024**
(State of incorporation)	**(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)

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

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

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

Large Accelerated Filer	☒	Accelerated Filer	☐
Non-Accelerated Filer	☐	Smaller Reporting Company	☐
Emerging Growth Company	☐		

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

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 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 May 5, 2020 was 101,773,274.

PART I. FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS

Arrowhead Pharmaceuticals, Inc.
Consolidated Balance Sheets

	(unaudited) March 31, 2020	September 30, 2019
ASSETS		
CURRENT ASSETS		
Cash and cash equivalents	$ 256,650,727	$ 221,804,128
Accounts receivable	1,265,771	661,361
Prepaid expenses	3,062,333	3,317,999
Other current assets	2,536,284	2,563,435
Short term investments	50,959,058	36,899,894
TOTAL CURRENT ASSETS	314,474,173	265,246,817
Property and equipment, net	29,362,741	23,214,899
Intangible assets, net	16,213,366	17,063,580
Long term investments	190,618,075	44,175,993
Right-of-use assets	10,263,197	-
Other assets	144,150	144,148
TOTAL ASSETS	**$ 561,075,702**	**$ 349,845,437**
LIABILITIES AND STOCKHOLDERS' EQUITY		
CURRENT LIABILITIES		
Accounts payable	$ 13,417,692	$ 7,649,921
Accrued expenses	4,419,233	6,504,729
Accrued payroll and benefits	1,616,090	4,955,887
Lease liabilities	688,454	-
Deferred rent	-	173,952
Deferred revenue	33,174,765	77,769,629
Other current liabilities	17,263	16,561
TOTAL CURRENT LIABILITIES	53,333,497	97,070,679
LONG-TERM LIABILITIES		
Lease liabilities, net of current portion	14,178,735	-
Deferred rent, net of current portion	-	3,703,364
Deferred revenue, net of current portion	-	5,035,142
TOTAL LONG-TERM LIABILITIES	14,178,735	8,738,506
Commitments and contingencies (Note 7)		
STOCKHOLDERS' EQUITY		
Arrowhead Pharmaceuticals, Inc. stockholders' equity:		
Common stock, $0.001 par value; 145,000,000 shares authorized; 101,748,107 and 95,506,271 shares issued and outstanding as of March 31, 2020 and September 30, 2019, respectively	194,117	187,876
Additional paid-in capital	936,353,920	664,086,155
Accumulated other comprehensive income (loss)	(629,114)	(391,624)
Accumulated deficit	(441,800,265)	(419,290,967)
Total Arrowhead Pharmaceuticals, Inc. stockholders' equity	494,118,658	244,591,440
Noncontrolling interest	(555,188)	(555,188)
TOTAL STOCKHOLDERS' EQUITY	493,563,470	244,036,252
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	**$ 561,075,702**	**$ 349,845,437**

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)

	Three Months Ended March 31,		Six Months Ended March 31,	
	2020	**2019**	**2020**	**2019**
REVENUE	**$ 23,528,853**	**$ 48,148,275**	**$ 52,983,433**	**$ 82,806,171**
OPERATING EXPENSES				
Research and development	29,443,335	20,798,628	52,816,951	38,370,671
General and administrative expenses	16,325,773	5,338,955	27,260,330	11,478,664
TOTAL OPERATING EXPENSES	**45,769,108**	**26,137,583**	**80,077,281**	**49,849,335**
OPERATING INCOME (LOSS)	(22,240,255)	22,010,692	(27,093,848)	32,956,836
OTHER INCOME (EXPENSE)				
Interest income (expense), net	2,404,685	1,886,290	4,584,550	2,977,399
TOTAL OTHER INCOME (EXPENSE)	**2,404,685**	**1,886,290**	**4,584,550**	**2,977,399**
INCOME (LOSS) BEFORE INCOME TAXES	**(19,835,570)**	**23,896,982**	**(22,509,298)**	**35,934,235**
Provision for income taxes	-	-	-	-
NET INCOME (LOSS)	**(19,835,570)**	**23,896,982**	**(22,509,298)**	**35,934,235**
NET INCOME (LOSS) PER SHARE - BASIC	$ (0.20)	$ 0.25	$ (0.23)	$ 0.39
NET INCOME (LOSS) PER SHARE - DILUTED	$ (0.20)	$ 0.24	$ (0.23)	$ 0.37
Weighted average shares outstanding - basic	101,653,136	94,155,407	99,359,140	92,623,615
Weighted average shares outstanding - diluted	101,653,136	98,082,644	99,359,140	97,214,546
OTHER COMPREHENSIVE INCOME (LOSS), NET OF TAX:				
Foreign currency translation adjustments	(433,564)	(28,162)	(237,490)	(50,342)
COMPREHENSIVE INCOME (LOSS)	**$ (20,269,134)**	**$ 23,868,820**	**$ (22,746,788)**	**$ 35,883,893**

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

Arrowhead Pharmaceuticals, Inc.
Consolidated Statement of Stockholders' Equity
(unaudited)

	Common Stock	Amount ($)	Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Non-controlling Interest	Totals
Balance at December 31, 2018	**92,591,457**	**$ 184,961**	**$ 647,142,565**	**$ (43,744)**	**$ (475,228,563)**	**$ (555,188)**	**$ 171,500,031**
Stock-based compensation	-	-	2,601,348	-	-	-	2,601,348
Exercise of stock options	535,915	536	2,669,501	-	-	-	2,670,037
Common stock - restricted stock units vesting	1,538,346	1,538	(1,538)	-	-	-	-
Common stock - issued for cash	-	-	-	-	-	-	-
Foreign currency translation adjustments	-	-	-	(28,162)	-	-	(28,162)
Net income (loss) for the three months ended March 31, 2019	-	-	-	-	23,896,982	-	23,896,982
Balance at March 31, 2019	**94,665,718**	**$ 187,035**	**$ 652,411,876**	**$ (71,906)**	**$ (451,331,581)**	**$ (555,188)**	**$ 200,640,236**

	Common Stock	Amount ($)	Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Non-controlling Interest	Totals
Balance at December 31, 2019	**101,111,797**	**$ 193,481**	**$ 922,050,595**	**$ (195,550)**	**$ (421,964,695)**	**$ (555,188)**	**$ 499,528,643**
Stock-based compensation	-	-	12,971,702	-	-	-	12,971,702
Exercise of stock options	214,239	214	1,329,810	-	-	-	1,330,024
Common stock - restricted stock units vesting	422,071	422	(422)	-	-	-	-
Common stock - issued for cash	-	-	2,235	-	-	-	2,235
Foreign currency translation adjustments	-	-	-	(433,564)	-	-	(433,564)
Net income (loss) for the three months ended March 31, 2020	-	-	-	-	(19,835,570)	-	(19,835,570)
Balance at March 31, 2020	**101,748,107**	**$ 194,117**	**$ 936,353,920**	**$ (629,114)**	**$ (441,800,265)**	**$ (555,188)**	**$ 493,563,470**

	Common Stock	Amount ($)	Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Non-controlling Interest	Totals
Balance at September 30, 2018	**88,505,302**	**$ 180,875**	**$ 582,902,694**	**$ (21,564)**	**$ (487,265,816)**	**$ (555,188)**	**$ 95,241,001**
Stock-based compensation	-	-	5,318,882	-	-	-	5,318,882
Exercise of stock options	702,242	702	3,674,029	-	-	-	3,674,731
Common stock - restricted stock units vesting	2,197,305	2,197	(2,197)	-	-	-	-
Common stock - issued for cash	3,260,869	3,261	60,518,468	-	-	-	60,521,729
Foreign currency translation adjustments	-	-	-	(50,342)	-	-	(50,342)
Net income (loss) for the six months ended March 31, 2019	-	-	-	-	35,934,235	-	35,934,235
Balance at March 31, 2019	**94,665,718**	**$ 187,035**	**$ 652,411,876**	**$ (71,906)**	**$ (451,331,581)**	**$ (555,188)**	**$ 200,640,236**

	Common Stock	Amount ($)	Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Non-controlling Interest	Totals
Balance at September 30, 2019	**95,506,271**	**$ 187,876**	**$ 664,086,155**	**$ (391,624)**	**$ (419,290,967)**	**$ (555,188)**	**$ 244,036,252**
Stock-based compensation	-	-	17,463,455	-	-	-	17,463,455
Exercise of stock options	686,432	686	4,330,891	-	-	-	4,331,577
Common stock - restricted stock units vesting	955,404	955	(955)	-	-	-	-
Common stock - issued for cash	4,600,000	4,600	250,474,374	-	-	-	250,478,974
Foreign currency translation adjustments	-	-	-	(237,490)	-	-	(237,490)
Net income (loss) for the six months ended March 31, 2020	-	-	-	-	(22,509,298)	-	(22,509,298)
Balance at March 31, 2020	**101,748,107**	**$ 194,117**	**$ 936,353,920**	**$ (629,114)**	**$ (441,800,265)**	**$ (555,188)**	**$ 493,563,470**

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

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

	Six Months Ended March 31,	
	2020	**2019**
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net income (loss)	$ (22,509,298)	$ 35,934,235
Stock-based compensation	17,463,455	5,318,882
Depreciation and amortization	2,631,472	2,353,319
Amortization/(accretion) of note premiums	419,212	330,229
Changes in operating assets and liabilities:		
Accounts receivable	(604,410)	(13,094,965)
Prepaid expenses and other current assets	46,520	(1,440,287)
Deferred revenue	(49,630,006)	120,622,138
Accounts payable	5,767,770	1,256,092
Accrued expenses	(5,424,591)	(2,340,651)
Other	725,481	(240,737)
NET CASH PROVIDED BY (USED IN) OPERATING ACTIVITIES	(51,114,395)	148,698,255
CASH FLOWS FROM INVESTING ACTIVITIES:		
Purchases of property and equipment	(7,929,100)	(946,788)
Purchases of marketable securities	(180,523,424)	(90,266,001)
Proceeds from sale of marketable securities	19,602,967	12,239,219
NET CASH PROVIDED BY (USED IN) INVESTING ACTIVITIES	(168,849,557)	(78,973,570)
CASH FLOWS FROM FINANCING ACTIVITIES:		
Principal payments on notes payable	-	(2,415,150)
Proceeds from the exercises of stock options	4,331,577	3,674,731
Proceeds from the issuance of common stock	250,478,974	60,521,729
NET CASH PROVIDED BY (USED IN) FINANCING ACTIVITIES	254,810,551	61,781,310
NET INCREASE (DECREASE) IN CASH	34,846,599	131,505,995
CASH AND CASH EQUIVALENTS AT BEGINNING OF PERIOD	221,804,128	30,133,213
CASH AND CASH EQUIVALENTS AT END OF PERIOD	$ 256,650,727	$ 161,639,208
Supplementary disclosures:		
Interest paid	$ -	$ (27,437)
Income Taxes Paid	$ -	$ (2,400)

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

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 collectively to Arrowhead Madison Inc. ("Arrowhead Madison"), Arrowhead Australia Pty Ltd ("Arrowhead Australia") and Ablaris Therapeutics, Inc. ("Ablaris"), (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, or 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-AAT for liver disease associated with alpha-1 antitrypsin deficiency (AATD), ARO-APOC3 for hypertriglyceridemia, ARO-ANG3 for dyslipidemia, ARO-HSD for liver disease, ARO-ENaC for cystic fibrosis, ARO-HIF2 for renal cell carcinoma, and ARO-LUNG2 as a candidate to treat chronic obstructive pulmonary disease (COPD). ARO-JNJ1 is being developed for an undisclosed liver-expressed target under a collaboration agreement with Janssen Pharmaceuticals, Inc. ("Janssen"). ARO-HBV (JNJ-3989) for chronic hepatitis B virus was out-licensed to Janssen in October 2018. ARO-LPA (AMG 890) for cardiovascular disease was out-licensed to Amgen Inc. ("Amgen") in 2016.

Arrowhead operates a lab facility in Madison, Wisconsin, where the Company's research and development activities, including the development of RNAi therapeutics, are based. The Company's principal executive offices are located in Pasadena, California. During the three months ended March 31, 2020, the Company entered into a sublease for additional research and development facility space in San Diego, California as discussed further in Note 8 below.

During the first half of fiscal 2020, the Company has continued to develop its pipeline and partnered candidates. The Company has began dosing in an adaptive design phase 2/3 trial, called SEQUOIA, with the potential to serve as a pivotal registration study of ARO-AAT. The Company also began dosing in its ARO-AAT 2002 study, a pilot open-label, multi-dose Phase 2 study to assess changes in novel histological activity scale in response to ARO-AAT over time in patients with alpha-1 antitrypsin deficiency associated liver disease. The Company also presented new clinical data on its two cardiometabolic candidates, ARO-APOC3 and ARO-ANG3, in two late-breaking oral presentations at the American Heart Association Scientific Sessions 2019. The Company also filed an IND to begin a phase 1b study of ARO-HIF2, filed a CTA to begin a phase 1 study of ARO-HSD, and filed a CTA to begin a phase 1 study of ARO-ENaC.

The Company's partnered candidates under its collaboration agreements with Janssen and Amgen also continue 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, and in connection with the start of this study Arrowhead earned a $25 million milestone payment under the License Agreement ("Janssen License Agreement"). Janssen has also nominated the first of 3 potential candidates under the Research Collaboration and Option Agreement ("Janssen Collaboration Agreement"), ARO-JNJ1, and the Company is currently performing discovery, optimization and preclinical research and development for this candidate. Under the terms of the Janssen agreements taken together, the Company has received $175 million as an upfront payment, $75 million in the form of an equity investment by JJDC in Arrowhead common stock, two $25 million milestone payments 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 up to mid teens under the Janssen License Agreement and up to low teens under the Janssen Collaboration Agreement on product sales. The Company's collaboration agreement with Amgen for AMG 890 (ARO-LPA), (the "Second Collaboration and License Agreement" or "AMG 890 (ARO-LPA) Agreement"), continues to progress. The Company has received $35 million in upfront payments, $21.5 million in the form of an equity investment by Amgen in the Company's Common Stock, a $10 million milestone payment, and may receive up to $420 million in development, regulatory and sales milestone payments. The Company is eligible to receive up to low double-digit royalties for sales of products under the AMG 890 (ARO-LPA) Agreement.

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

The Company is actively monitoring the novel coronavirus ("COVID-19") situation. The financial results for the three and six months ended March 31, 2020 were not significantly impacted by COVID-19. The Company has paused enrollment in its two ARO-AAT studies: SEQUOIA and the ARO-AAT 2002 study, but now is working with sites and investigators to begin the process of resuming screening and enrollment. Patients already enrolled in these studies continue to be dosed per protocol and continue to come in for their follow up visits. Additional delays have occurred in the Company's earlier stage programs, but we do not expect a material impact to any program's anticipated timelines. Additionally, the Company's operations at its research and development facility in Madison, WI and its corporate headquarters in Pasadena, CA have continued to operate with limited impact, other than for enhanced safety measures including work from home policies.

Liquidity

The Consolidated Financial Statements have been prepared in conformity with the accounting principles generally accepted in the United States of America, which contemplate the continuation of the Company as a going concern. Historically, the Company's primary source of financing has been through the sale of its securities. 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 March 31, 2020 the Company had $256.7 million in cash and cash equivalents (including $1.8 million in restricted cash), $51.0 million in short-term investments, and $190.6 million in long-term investments to fund operations. During the six months ended March 31, 2020, the Company's cash and investments balance increased by $195.4 million, which was primarily the result of the December 2019 securities offering that generated $250.5 million in net cash proceeds for the Company, as discussed further in Note 6 below. These cash inflows were partially offset by cash outflows primarily related to operating activities.

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, except as a result of the Financial Accounting Standards Board (FASB)'s Accounting Standards Update (ASU) No. 2016-02, Leases (ASC 842), as discussed below.

Leases — The Company determines whether a contract is, or contains, a lease at inception. The Company classifies each of its leases as operating or financing considering factors such as the length of the lease term, the present value of the lease payments, the nature of the asset being leased, and the potential for ownership of the asset to transfer during the lease term. Leases with terms greater than one-year are recognized on the Consolidated Balance Sheets as Right-of-use assets and Lease liabilities and are measured at the present value of the fixed payments due over the expected lease term less the present value of any incentives, rebates or abatements expected to be received from the lessor. Options to extend a lease are typically excluded from the expected lease term as the exercise of the option is typically not reasonably certain. The interest rate implicit in lease contracts is typically not readily determinable. As such, the Company utilizes the appropriate incremental borrowing rate, which is the rate incurred to borrow on a collateralized basis an amount equal to the lease payments over a similar term and in a similar economic environment. The Company records expense to recognize fixed lease payments on a straight-line basis over the expected lease term. Costs determined to be variable and not based on an index or rate are not included in the measurement of the lease liability and are expensed as incurred.

Recent Accounting Pronouncements

In March 2016, the FASB issued ASU No. 2016-02, Leases (Topic ASC 842). Under ASC 842, lessees are required to recognize a right-of-use asset and a right-of-use lease liability for virtually all leases other than those that meet the definition of a short-term lease. For income statement purposes, a dual model was retained, requiring leases to be classified as either operating or finance. Operating leases will result in straight-line expense while finance leases will result in a front-loaded expense pattern (similar to current capital leases). The Company adopted this standard effective October 1, 2019 and elected the package of three practical expedients that permits an entity to a) not reassess whether expired or existing contracts contain leases, b) not reassess lease classification for existing or expired leases, and c) not consider whether previously capitalized initial direct costs would be appropriate under the new standard. At March 31, 2020, the Company has recorded right-of-use assets of $10.3 million and right-of-use liabilities of $14.9 million on its Consolidated Balance Sheets for its research and development facility lease in Madison, Wisconsin, and its corporate headquarters lease in Pasadena, California, as discussed further in Note 8 below. The adoption of this standard did not have a material impact on the Company's Consolidated Statement of Comprehensive Income (Loss) and the Company's Consolidated Statement of Cash Flows.

In November 2018, the FASB issued 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 becomes effective for the Company in the first quarter of fiscal 2021 with early adoption permitted. The Company does not expect the adoption of this update to have a material effect 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 Inc., a Delaware corporation ("Amgen"). Under one of the license agreements (the "Second Collaboration and License Agreement" or "AMG 890 (ARO-LPA) Agreement"), Amgen has received a worldwide, exclusive license to Arrowhead's novel, RNAi 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 license agreement (the "First Collaboration and License Agreement" or "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 million in upfront payments, $21.5 million in the form of an equity investment by Amgen in the Company's Common Stock, and a $10 million milestone payment, and may receive up to $420 million in 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 AMG 890 (ARO-LPA) 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 AMG 890 (ARO-LPA) Agreement and the ARO-AMG1 Agreement. Future milestones and royalties achieved will be recognized in their entirety when earned. During the three and six months ended March 31, 2020 and 2019, the Company recognized $0 and $0.3 million of Revenue associated with its agreements with Amgen, respectively. As of March 31, 2020, there were $0 contract assets recorded as accounts receivable, and $0 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 a License Agreement ("Janssen License Agreement") and a Research Collaboration and Option Agreement ("Janssen Collaboration Agreement") with Janssen Pharmaceuticals, Inc. ("Janssen") part of the Janssen Pharmaceutical Companies of Johnson & Johnson. The Company also entered into a Stock Purchase Agreement ("JJDC Stock Purchase Agreement") with Johnson & Johnson Innovation-JJDC, Inc. ("JJDC"), a New Jersey corporation. 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 potentially curative therapy for patients with chronic hepatitis B virus infection. Beyond the Company's ongoing Phase 1 / 2 study of JNJ-3989 (ARO-HBV), Janssen will be wholly responsible for clinical development and commercialization. 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 will not include candidates in the Company's current pipeline. The Company will perform discovery, optimization and preclinical research and development, entirely funded by Janssen, 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 million as an upfront payment, $75 million in the form of an equity investment by JJDC in Arrowhead common stock under the JJDC Stock Purchase Agreement, and two $25 million milestone payments, 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 up to mid teens under the Janssen License Agreement and up to low teens under the Janssen Collaboration Agreement on product sales.

The Company has evaluated these agreements in accordance with the new revenue recognition standard that became effective for the Company on October 1, 2018. The adoption of the new revenue standard did not have a material impact on the balances reported when evaluated under the superseded revenue standard. At the inception of these agreements, the Company has 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 ongoing 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 will be accounted for if and when it is exercised.

The Company determined the transaction price totaled approximately $252.5 million which includes the upfront payment, the premium paid by JJDC for its equity investment in the Company, the two $25 million milestone payments earned and estimated payments for reimbursable Janssen R&D services to be performed. The Company has allocated the total $252.5 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 labor hours versus estimated total labor hours) beginning in October 2018 and ending as the Company's efforts in overseeing the ongoing phase 1 / 2 clinical trial are completed. During the three months ended March 31, 2020 and 2019, the Company recognized approximately $22.2 million and $47.9 million of Revenue associated with its agreements with Janssen and JJDC, respectively. During the six months ended March 31, 2020 and 2019, the Company recognized approximately $50.9 million and $82.5 million of Revenue associated with its agreements with Janssen and JJDC, respectively. As of March 31, 2020, there were $0 in contract assets recorded as accounts receivable, and $33.2 million of contract liabilities recorded as current deferred revenue on the Company's Consolidated Balance Sheets. The $33.2 million of current deferred revenue is driven by the upfront payment, the premium paid by JJDC for its equity investment in the Company, and the two $25 million milestone payments earned, net of revenue recognized to date.

Janssen has also selected the first of the three targets under the Janssen Collaboration Agreement, now referred to as ARO-JNJ1, and the Company has begun to conduct its discovery, optimization and preclinical research and development of ARO-JNJ1. All costs and labor hours spent by the Company will be entirely funded by Janssen. During the three months ended March 31, 2020 and 2019, the Company recognized approximately $1.4 million and $0 of Revenue associated with its efforts on the ARO-JNJ1 candidate, respectively. During the six months ended March 31, 2020 and 2019, the Company recognized $2.1 million and $0 of Revenue associated with these efforts on the ARO-JNJ1 candidate, respectively. As of March 31, 2020, there were $1.3 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.

NOTE 3. ***PROPERTY AND EQUIPMENT***

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

	March 31, 2020	September 30, 2019
Computers, office equipment and furniture	$ 635,769	$ 637,577
Research equipment	18,098,960	12,932,304
Software	293,189	147,254
Leasehold improvements	24,187,465	21,579,415
Total gross fixed assets	43,215,383	35,296,550
Less: Accumulated depreciation and amortization	(13,852,642)	(12,081,651)
Property and equipment, net	$ 29,362,741	$ 23,214,899

Depreciation and amortization expense for property and equipment for the three months ended March 31, 2020 and 2019 was $946,481 and $750,860, respectively. Depreciation and amortization expense for property and equipment for the six months ended March 31, 2020 and 2019 was $1,781,258 and $1,503,105, respectively.

NOTE 4. ***INVESTMENTS***

The Company invests a portion of its excess cash balances in short-term and long-term debt securities. Investments at March 31, 2020 consisted of corporate bonds with maturities remaining of less than or equal to 36 months. The Company may also invest excess cash balances in certificates of deposits, money market accounts, government-sponsored enterprise securities, corporate bonds and/or commercial paper. The Company accounts for its investments in accordance with FASB ASC 320, Investments – Debt and Equity Securities. At March 31, 2020, all investments were classified as held-to-maturity securities.

The following tables summarize the Company's short-term and long-term investments as of March 31, 2020, and September 30, 2019.

	As of March 31, 2020			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Commercial notes (due within one year)	$ 50,959,058	$ 264,194	$ (37,786)	$ 51,185,466
Commercial notes (due within one through three years)	$ 190,618,075	$ 1,735,812	$ (1,481,115)	$ 190,872,772
Total	$ 241,577,133	$ 2,000,006	$ (1,518,901)	$ 242,058,238

	As of September 30, 2019			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Commercial notes (due within one year)	$ 36,899,894	$ 222,584	$ —	$ 37,122,478
Commercial notes (due within one through three years)	$ 44,175,993	$ 875,258	$ —	$ 45,051,251
Total	$ 81,075,887	$ 1,097,842	$ —	$ 82,173,729

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 approximately $754,394. 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 approximately $7,889,455. Amortization expense for the three months ended March 31, 2020 and 2019 was $425,107 and $425,108, respectively. Amortization expense for the six months ended March 31, 2020 and 2019 was $850,214 and $850,215, respectively. Amortization expense is expected to be $850,215 for the remainder of fiscal 2020, $1,700,429 in 2021, $1,700,429 in 2022, $1,700,429 in 2023, $1,700,429 in 2024, and $8,561,435 thereafter.

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

	Intangible assets subject to amortization
Balance at September 30, 2019	$ 17,063,580
Impairment	—
Amortization	(850,214)
Balance at March 31, 2020	$ 16,213,366

NOTE 6. ***STOCKHOLDERS' EQUITY***

At March 31, 2020, 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 March 31, 2020, 101,748,107 shares of Common Stock were outstanding. At March 31, 2020, 8,474,561 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 and 2013 Incentive Plan, as well as for inducement grants made to new employees.

In December 31, 2019 the Company sold 4,600,000 shares of its Common Stock in a public offering at a price of $58.00 per share. The aggregate purchase price paid by the investors for the Common Stock was $266.8 million, and the Company received net proceeds of $250.5 million after deducting advisory fees and offering expenses.

NOTE 7. *COMMITMENTS AND CONTINGENCIES*

Litigation

On occasion, 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 March 31, 2020.

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 March 31, 2020, these future commitments were estimated at approximately $72.2 million, of which approximately $40.0 million is expected to be incurred in fiscal 2020, and $32.2 million is expected to be incurred beyond fiscal 2020.

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 NDA 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 six months ended March 31, 2020, the Company accrued a $0.9 million milestone payment related to the progression of the ARO-ENaC program. During the three and six months ended March 31, 2019, the Company did not accrue for any milestone payments. 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 a new 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, and this lease has replaced the Company's previous corporate headquarters office lease. The increased capacity of this new office space compared to the Company's current corporate headquarters will 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 $8.8 million over the term. The Company expects to pay approximately $3.5 million for leasehold improvements, net of tenant improvement allowances. The lease contains an option to renew for one 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 March 31, 2020.

The Company also leases approximately 74,000 square feet of office and laboratory space for its research facility in Madison, Wisconsin. The lease will expire in September 2029. Lease payments are estimated to total approximately $13.3 million for the term. The lease contains two options to renew for two 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 March 31, 2020.

Operating lease cost during the three and six months ended March 31, 2020 was $0.5 million and $0.9 million, respectively. Variable lease costs during the three and six months ended March 31, 2020 were $0.2 million and $0.3 million, respectively. There was no short-term lease cost during the three and six months ended March 31, 2020.

The following table presents maturities of operating lease liabilities on an undiscounted basis as of March 31, 2020:

2020 (remainder of fiscal year)	$ 936,566
2021	2,256,379
2022	2,521,446
2023	2,590,558
2024	2,661,512
2025 and thereafter	10,834,206
Total lease payments	21,800,667
Less imputed interest	(6,933,478)
Total operating lease liabilities (includes current portion)	$ 14,867,189

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 three and six months ended March 31, 2020 was $0.3 million and $0.6 million, respectively. The weighted-average remaining lease term and weighted-average discount rate for all leases as of March 31, 2020 was 8.6 years and 8.9%, respectively.

As of September 30, 2019, future minimum lease payments due in fiscal years under operating leases were as follows:

2020	$ 1,521,451
2021	2,256,379
2022	2,521,446
2023	2,590,558
2024	2,661,512
2025 and thereafter	10,834,206
Total	$ 22,385,552

During the three months ended March 31, 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 space consists of approximately 21,000 rentable square feet located at 11404 Sorento Valley Road, San Diego, California, 92121. The term of the Sublease commenced on April 1, 2020 and will expire on January 14, 2023. Lease payments are estimated to total approximately $2.1 million over the term.

NOTE 9. ***STOCK-BASED COMPENSATION***

Arrowhead has two plans that provide for equity-based compensation. Under the 2004 Equity Incentive Plan and 2013 Incentive Plan, as of March 31, 2020, 886,598 and 5,972,038 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 March 31, 2020, there were options granted and outstanding to purchase 886,598 and 2,798,538 shares of Common Stock under the 2004 Equity Incentive Plan and the 2013 Incentive Plan, respectively, and there were 2,783,000 restricted stock units granted and outstanding under the 2013 Incentive Plan. Also, as of March 31, 2020, there were 1,024,850 shares reserved for options and 591,075 shares reserved for restricted stock units issued as inducement grants to new employees outside of equity compensation plans. During the three months ended March 31, 2020, 306,500 options and 1,744,071 restricted stock units were granted under the 2013 Incentive Plan, and 126,000 options and 300,000 restricted stock units were granted as inducement awards to new employees outside of equity incentive plans. During the six months ended March 31, 2020, 310,500 options and 1,749,071 restricted stock units were granted under the 2013 Incentive Plan, and 343,000 options and 584,575 restricted stock units were granted as inducement awards to new employees outside of the equity incentive plans.

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, 2019	4,773,670	$ 8.16		
Granted	653,500	53.78		
Cancelled	(30,752)	15.00		
Exercised	(686,432)	6.31		
Balance At March 31, 2020	4,709,986	$ 14.72	6.2 years	$82,658,407
Exercisable At March 31, 2020	3,111,009	$ 7.12	4.8 years	$ 67,796,517

Stock-based compensation expense related to stock options for the three months ended March 31, 2020 and 2019 was $2,527,839 and $1,017,065, respectively. Stock-based compensation expense related to stock options for the six months ended March 31, 2020 and 2019 was $4,136,910 and $1,807,500, 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 March 31, 2020 and 2019 was $17,968,884 and $7,580,360, respectively. The grant date fair value of the options granted by the Company for the six months ended March 31, 2020 and 2019 was $26,599,374 and $8,137,249, respectively.

The intrinsic value of the options exercised during the three months ended March 31, 2020 and 2019 was $8,605,235 and $6,806,594, respectively. The intrinsic value of the options exercised during the six months ended March 31, 2020 and 2019 was $30,245,825 and $8,122,294, respectively.

As of March 31, 2020, the pre-tax compensation expense for all outstanding unvested stock options in the amount of $34,707,355 will be recognized in the Company's results of operations over a weighted average period of 3.5 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:

	Six Months Ended March 31,	
	2020	2019
Dividend yield	—	—
Risk-free interest rate	0.5 – 1.8%	2.3 – 3.1%
Volatility	90.5 – 91.8%	115%
Expected life (in years)	6.25	6.25
Weighted average grant date fair value per share of options granted	$40.70	$11.42

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, were granted under the Company's 2013 Incentive Plan and as inducements grants granted outside of the Plan. During the three months ended March 31, 2020, the Company issued 1,744,071 RSUs under the 2013 Incentive Plan and 300,000 RSUs as inducement awards. During the six months ended March 31, 2020, the Company issued 1,749,071 RSUs under the 2013 Incentive Plan and 584,575 RSUs as inducement awards. At vesting, each outstanding RSU will be exchanged for one share of the Company's Common Stock. RSU recipients may elect to net share settle upon vesting, in which case the Company pays the employee's income taxes due upon vesting and withholds a number of shares of Common Stock of equal value. 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, 2019	2,062,833	$ 9.43
Granted	2,333,646	58.27
Vested	(955,404)	9.07
Forfeited	(67,000)	31.78
Unvested at March 31, 2020	3,374,075	$ 42.87

During the three months ended March 31, 2020 and 2019, the Company recorded $10,443,863 and $1,584,283 of expense related to RSUs, respectively. During the six months ended March 31, 2020 and 2019, the Company recorded $13,326,545 and $3,511,381 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.

As of March 31, 2020 the pre-tax compensation expense for all unvested RSUs in the amount of $89,156,048 will be recognized in the Company's results of operations over a weighted average period of 3.5 years.

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 March 31, 2020 and September 30, 2019 for assets and liabilities measured at fair value on a recurring basis:

March 31, 2020:

	Level 1	Level 2	Level 3	Total
Cash and cash equivalents	$ 256,650,727	$ —	$ —	$ 256,650,727
Short-term investments	$ 51,185,466	$ —	$ —	$ 51,185,466
Long-term investments	$ 190,872,772	$ —	$ —	$ 190,872,772
Contingent consideration	$ —	$ —	$ —	$ —

September 30, 2019:

	Level 1	Level 2	Level 3	Total
Cash and cash equivalents	$ 221,804,128	$ —	$ —	$ 221,804,128
Short-term investments	$ 37,122,478	$ —	$ —	$ 37,122,478
Long-term investments	$ 45,051,251	$ —	$ —	$ 45,051,251
Contingent consideration	$ —	$ —	$ —	$ —

The Company had a liability for contingent consideration related to its acquisition of the Roche RNAi business completed in 2011. The fair value measurement of the contingent consideration obligations is determined using Level 3 inputs. The fair value of contingent consideration obligations is based on a discounted cash flow model using a probability-weighted income approach. The measurement is based upon unobservable inputs supported by little or no market activity based on the Company's assumptions and experience. Estimating timing to complete the development and obtain approval of products is difficult, and there are inherent uncertainties in developing a product candidate, such as obtaining FDA and other regulatory approvals. In determining the probability of regulatory approval and commercial success, the Company utilizes data regarding similar milestone events from several sources, including industry studies and its own experience. These fair value measurements represent Level 3 measurements as they are based on significant inputs not observable in the market. Significant judgment is employed in determining the appropriateness of these assumptions as of the acquisition date and for each subsequent period. Accordingly, changes in assumptions could have a material impact on the amount of contingent consideration expense the Company records in any given period. In November 2016, the Company announced the discontinuation of its clinical trial efforts for ARC-520, ARC-AAT and ARC-521. Given this development, the Company assessed the fair value of its contingent consideration obligation to be $0 at March 31, 2020 and September 30, 2019.

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," "could," "estimate," 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 businesses, 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. As such, our actual results may differ significantly 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 described in other documents we file from time to time with the Securities and Exchange Commission ("SEC"), including subsequent quarterly reports 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.

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, or 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-AAT for liver disease associated with alpha-1 antitrypsin deficiency (AATD), ARO-APOC3 for hypertriglyceridemia, ARO-ANG3 for dyslipidemia, ARO-HSD for liver disease, ARO-ENaC for cystic fibrosis, ARO-HIF2 for renal cell carcinoma, and ARO-LUNG2 as a candidate to treat chronic obstructive pulmonary disease (COPD). ARO-JNJ1 is being developed for an undisclosed liver-expressed target under a collaboration agreement with Janssen Pharmaceuticals, Inc. ("Janssen"). ARO-HBV (JNJ-3989) for chronic hepatitis B virus was out-licensed to Janssen in October 2018. ARO-LPA (AMG 890) for cardiovascular disease was out-licensed to Amgen Inc. ("Amgen") in 2016.

Arrowhead operates a lab facility in Madison, Wisconsin, where the Company's research and development activities, including the development of RNAi therapeutics, are based. The Company's principal executive offices are located in Pasadena, California. During the three months ended March 31, 2020, the Company entered into a sublease for additional research and development facility space in San Diego, 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 the first half of fiscal 2020, the Company has continued to develop its pipeline and partnered candidates. The Company has began dosing in an adaptive design phase 2/3 trial, called SEQUOIA, with the potential to serve as a pivotal registration study of ARO-AAT. The Company also began dosing in its ARO-AAT 2002 study, a pilot open-label, multi-dose Phase 2 study to assess changes in novel histological activity scale in response to ARO-AAT over time in patients with alpha-1 antitrypsin deficiency associated liver disease. The Company also presented new clinical data on its two cardiometabolic candidates, ARO-APOC3 and ARO-ANG3, in two late-breaking oral presentations at the American Heart Association Scientific Sessions 2019. The Company also filed an IND to begin a phase 1b study of ARO-HIF2, filed a CTA to begin a phase 1 study of ARO-HSD, and filed a CTA to begin phase 1 study of ARO-ENaC.

The Company's partnered candidates under its collaboration agreements with Janssen and Amgen also continue 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, and in connection with the start of this study Arrowhead earned a $25 million milestone payment under the License Agreement ("Janssen License Agreement"). Janssen has also nominated the first of 3 potential candidates under the Research Collaboration and Option Agreement ("Janssen Collaboration Agreement"), ARO-JNJ1, and the Company is currently performing discovery, optimization and preclinical research and development for this candidate. Under the terms of the Janssen agreements taken together, the Company has received $175 million as an upfront payment, $75 million in the form of an equity investment by Johnson & Johnson Innovation-JJDC, Inc. ("JJDC") in Arrowhead common stock under the Stock Purchase Agreement ("JJDC Stock Purchase Agreement"), two $25 million milestone payments 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 up to mid teens under the Janssen License Agreement and up to low teens under the Janssen Collaboration Agreement on product sales. The Company's collaboration agreement with Amgen for AMG 890 (ARO-LPA), (the "Second Collaboration and License Agreement" or "AMG 890 (ARO-LPA) Agreement"), continues to progress. The Company has received $35 million in upfront payments, $21.5 million in the form of an equity investment by Amgen in the Company's Common Stock, a $10 million milestone payment, and may receive up to $420 million in development, regulatory and sales milestone payments. The Company is eligible to receive up to low double-digit royalties for sales of products under the AMG 890 (ARO-LPA) Agreement.

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 manufactures 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 "program costs". If the clinical candidates progress through human testing, program costs will increase.

The Company is actively monitoring the novel coronavirus ("COVID-19") situation. The financial results for the three and six months ended March 31, 2020 were not significantly impacted by COVID-19. The Company has paused enrollment in its two ARO-AAT studies: SEQUOIA and the ARO-AAT 2002 study, but now is working with sites and investigators to begin the process of resuming screening and enrollment. Patients already enrolled in these studies continue to be dosed per protocol and continue to come in for their follow up visits. Additional delays have occurred in the Company's earlier stage programs, but we do not expect a material impact to any program's anticipated timelines. Several of the Company's other clinical candidates are in the start-up stage (ARO-HSD, ARO-HIF2 and ARO-ENaC), during which significant clinical costs will continue to be incurred. Additionally, the Company's operations at its research and development facility in Madison, WI and its corporate headquarters in Pasadena, CA 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 of 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 of the COVID-19 pandemic.

Net losses were $19.8 million for the three months ended March 31, 2020 as compared to net income of $23.9 million for the three months ended March 31, 2019. Net losses were $22.5 million for the six months ended March 31, 2020 as compared to net income of $35.9 million for the six months ended March 31, 2019. Net losses per share – diluted were $0.20 for the three months ended March 31, 2020 as compared to net income per share - diluted of $0.24 for the three months ended March 31, 2019. Net losses per share – diluted were $0.23 for the six months ended March 31, 2020 as compared to net income per share – diluted of $0.37 for the six months ended March 31, 2019. An increase in research and development and general and administrative expenses coupled with a decrease in revenue from the license and collaboration agreements with Janssen were the drivers of the increase in net losses and net losses per share, as discussed further below.

The Company strengthened its liquidity and financial position through the Janssen License Agreement, Janssen Collaboration Agreement and JJDC Stock Purchase Agreement, executed in October 2018. Under the terms of the agreements taken together, the Company has received $175 million as an upfront payment, $75 million in the form of an equity investment by JJDC in Arrowhead common stock, and two $25 million milestone payments. Additionally, in December 2019, the Company completed a securities offering which generated approximately $250.5 million in net cash proceeds. These cash proceeds secure the funding needed to continue to advance our pipeline candidates. The Company had $256.7 million of cash and cash equivalents, $51.0 million in short-term investments, $190.6 million of long term investments and $561.1 million of total assets as of March 31, 2020, as compared to $221.8 million, $36.9 million, $44.2 million and $349.8 million as of September 30, 2019, 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

Management makes certain judgments and uses certain estimates and assumptions when applying GAAP in the preparation of our Consolidated Financial Statements. We evaluate our estimates and judgments on an ongoing basis and base our estimates on historical experience and on assumptions that we believe to be reasonable under the circumstances. Our experience and assumptions form the basis for our judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may vary from what we anticipate and different assumptions or estimates about the future could change our reported results. We believe the following accounting policies are the most critical to us, in that they require our most difficult, subjective or complex judgments in the preparation of our consolidated financial statements. For further information, see *Note 1, Organization and Significant Accounting Policies*, to our Consolidated Financial Statements, which outlines our application 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, except as a result of the Financial Accounting Standards Board (FASB)'s Accounting Standards Update (ASU) No. 2016-02, Leases (ASC 842), as discussed below:

Leases - The Company determines whether a contract is, or contains, a lease at inception. The Company classifies each of its leases as operating or financing considering factors such as the length of the lease term, the present value of the lease payments, the nature of the asset being leased, and the potential for ownership of the asset to transfer during the lease term. Leases with terms greater than one-year are recognized on the Consolidated Balance Sheets as Right-of-use assets and Lease liabilities and are measured at the present value of the fixed payments due over the expected lease term minus the present value of any incentives, rebates or abatements expected to be received from the lessor. Options to extend a lease are typically excluded from the expected lease term as the exercise of the option is typically not reasonably certain. The interest rate implicit in lease contracts is typically not readily determinable. As such, the Company utilizes the appropriate incremental borrowing rate, which is the rate incurred to borrow on a collateralized basis an amount equal to the lease payments over a similar term and in a similar economic environment. The Company records expense to recognize fixed lease payments on a straight-line basis over the expected lease term. Costs determined to be variable and not based on an index or rate are not included in the measurement of the lease liability and are expensed as incurred.

Results of Operations

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

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
Revenue	$ 23,528,853	$ 48,148,275
Operating Income (Loss)	(22,240,255)	22,010,692
Net Income (Loss)	(19,835,570)	23,896,982
Net Income (Loss) per Share (Diluted)	$ (0.20)	$ 0.24

	Six Months Ended March 31, 2020	Six Months Ended March 31, 2019
Revenue	$ 52,983,433	$ 82,806,171
Operating Income (Loss)	(27,093,848)	32,956,836
Net Income (Loss)	(22,509,298)	35,934,235
Net Income (Loss) per Share (Diluted)	$ (0.23)	$ 0.37

The decrease in our Revenue during the three and six months ended March 31, 2020 was driven by the timing of progress achieved in completing our performance obligation from our agreements with Janssen and JJDC, which were executed in October 2018. The increase in our Net Loss during the three and six months ended March 31, 2020 was driven by this decrease in Revenue and also increases in Research and Development and General and Administrative Expenses as our pipeline of clinical candidates has continued to increase.

Revenue

Total revenue was $23,528,853 for the three months ended March 31, 2020 and $48,148,275 for the three months ended March 31, 2019. Total revenue was $52,983,433 for the six months ended March 31, 2020 and $82,806,171 for the six months ended March 31, 2019. Revenue in the both periods is primarily related to the recognition of a portion of the $252.5 million initial transaction price associated with our agreements with Janssen and JJDC as we achieved progress toward completing our performance obligation within those agreements.

Amgen Inc.

On September 28, 2016, the Company entered into two Collaboration and License agreements, and a Common Stock Purchase Agreement with Amgen Inc., a Delaware corporation ("Amgen"). Under one of the license agreements (the "Second Collaboration and License Agreement" or "AMG 890 (ARO-LPA) Agreement"), Amgen has received a worldwide, exclusive license to Arrowhead's novel, RNAi 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 license agreement (the "First Collaboration and License Agreement" or "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 million in upfront payments, $21.5 million in the form of an equity investment by Amgen in the Company's Common Stock, and a $10 million milestone payment, and may receive up to $420 million in 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 AMG 890 (ARO-LPA) 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 AMG 890 (ARO-LPA) Agreement and the ARO-AMG1 Agreement. Future milestones and royalties achieved will be recognized in their entirety when earned. During the three and six months ended March 31, 2020, the Company recognized $0 of Revenue associated with its agreements with Amgen. During the three and six months ended March 31, 2019, the Company recognized $0.3 million of Revenue associated with its agreements with Amgen. As of March 31, 2020, there was $0 contract assets recorded as accounts receivable, and $0 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 a License Agreement ("Janssen License Agreement") and a Research Collaboration and Option Agreement ("Janssen Collaboration Agreement") with Janssen Pharmaceuticals, Inc. ("Janssen") part of the Janssen Pharmaceutical Companies of Johnson & Johnson. The Company also entered into a Stock Purchase Agreement ("JJDC Stock Purchase Agreement") with Johnson & Johnson Innovation-JJDC, Inc. ("JJDC"), a New Jersey corporation. 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 potentially curative therapy for patients with chronic hepatitis B virus infection. Beyond the Company's ongoing Phase 1 / 2 study of JNJ-3989 (ARO-HBV), Janssen will be wholly responsible for clinical development and commercialization. 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 will not include candidates in the Company's current pipeline. The Company will perform discovery, optimization and preclinical research and development, entirely funded by Janssen, 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 million as an upfront payment, $75 million in the form of an equity investment by JJDC in Arrowhead common stock, two $25 million milestone payments 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 up to mid teens under the Janssen License Agreement and up to low teens under the Janssen Collaboration Agreement on product sales.

The Company has evaluated these agreements in accordance with the new revenue recognition requirements that became effective for the Company on October 1, 2018. The adoption of the new revenue standard did not have a material impact on the balances reported when evaluated under the superseded revenue standard. At the inception of these agreements, the Company has 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 ongoing Phase 1 / 2 study of JNJ-3989 (ARO-HBV) and the Company's responsibility to ensure certain manufacturing of 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 will be accounted for if and when it is exercised.

The Company determined the transaction price totaled approximately $252.5 million which includes the upfront payment, the premium paid by JJDC for its equity investment in the Company, the two $25 million milestone payments earned and estimated payments for reimbursable Janssen R&D services to be performed. The Company has allocated the total $252.5 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 labor hours versus estimated total labor hours) beginning in October 2018 and ending as the Company's efforts in overseeing the ongoing phase 1 / 2 clinical trial are completed. During the three months ended March 31, 2020 and 2019, the Company recognized approximately $22.2 million and $47.9 million of Revenue associated with its agreements with Janssen and JJDC, respectively. During the six months ended March 31, 2020 and 2019, the Company recognized approximately $50.9 million and $82.5 million of Revenue associated with its agreements with Janssen and JJDC, respectively. As of March 31, 2020, there were $0 in contract assets recorded as accounts receivable, and $33.2 million of contract liabilities recorded as current deferred revenue on the Company's Consolidated Balance Sheets. The $33.2 million of current deferred revenue is driven by the upfront payment, the premium paid by JJDC for its equity investment in the Company, and the two $25 million milestone payments earned, net of revenue recognized to date.

Janssen has also selected the first of the three targets under the Janssen Collaboration Agreement, now referred to as ARO-JNJ1, and the Company has begun to conduct its discovery, optimization and preclinical research and development of ARO-JNJ1. All costs and labor hours spent by the Company will be entirely funded by Janssen. During the three months ended March 31, 2020 and 2019, the Company recognized $1.4 million and $0 of Revenue associated with its efforts on the ARO-JNJ1 candidate, respectively. During the six months ended March 31, 2020 and 2019, the Company recognized $2.1 million and $0 of Revenue associated with these efforts on the ARO-JNJ1 candidate, respectively. As of March 31, 2020, there were $1.3 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.

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 six months ended March 31, 2020 and 2019 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 facility in Madison, Wisconsin, 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 Madison research facility. The following table provides details of research and development expenses for the periods indicated:

(in thousands)

	Three Months Ended March 31, 2020	% of Expense Category	Three Months Ended March 31, 2019	% of Expense Category	Increase (Decrease) $	Increase (Decrease) %
Salaries	$ 4,216	14%	$ 3,387	16%	$ 829	24%
Stock compensation	2,953	10%	881	4%	2,072	235%
In Vivo studies	776	3%	413	2%	363	88%
Drug manufacturing	7,377	25%	7,430	36%	(53)	-1%
Toxicity/efficacy studies	2,171	7%	2,410	12%	(239)	-10%
Clinical trials	5,268	18%	3,205	15%	2,063	64%
License, royalty & milestones	900	3%	-	0%	900	N/A
Facilities related	823	3%	783	4%	40	5%
Depreciation/amortization	1,219	4%	1,170	6%	49	4%
Other R&D	3,740	13%	1,120	5%	2,620	234%
Total	$ 29,443	100%	$ 20,799	100%	$ 8,644	42%

	Six Months Ended March 31, 2020	% of Expense Category	Six Months Ended March 31, 2019	% of Expense Category	Increase (Decrease) $	Increase (Decrease) %
Salaries	$ 8,312	16%	$ 6,664	17%	$ 1,648	25%
Stock compensation	4,115	8%	1,522	4%	2,593	170%
In Vivo studies	1,747	3%	896	2%	851	95%
Drug manufacturing	12,485	24%	13,234	35%	(749)	-6%
Toxicity/efficacy studies	6,123	12%	4,821	13%	1,302	27%
Clinical trials	9,635	18%	5,447	14%	4,188	77%
License, royalty & milestones	903	2%	-	0%	903	N/A
Facilities related	1,444	3%	1,366	4%	78	6%
Depreciation/amortization	2,330	4%	2,342	6%	(12)	-1%
Other R&D	5,723	11%	2,079	5%	3,644	175%
Total	$ 52,817	100%	$ 38,371	100%	$ 14,446	38%

Salaries expense increased by $829,000 from $3,387,000 during the three months ended March 31, 2019 to $4,216,000 during the current period. Salaries expense increased by $1,648,000 from $6,664,000 during the six months ended March 31, 2019 to $8,312,000 during the current period. The increase in the expense is primarily due to an increase in R&D headcount that has occurred as the Company has expanded its pipeline of candidates.

Stock compensation expense, a non-cash expense, increased by $2,072,000 from $881,000 during the three months ended March 31, 2019 to $2,953,000 during the current period. Stock compensation expense, a non-cash expense, increased by $2,593,000 from $1,522,000 during the six months ended March 31, 2019 to $4,115,000 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 is primarily due to the increased headcount discussed above and a mix of higher grant date fair values of awards amortizing during the periods due to the Company's stock price at the time of the grants.

In vivo studies expense increased by $363,000 from $413,000 during the three months ended March 31, 2019 to $776,000 during the current period. In vivo studies expense increased by $851,000 from $896,000 during the six months ended March 31, 2019 to $1,747,000 during the current period. In vivo studies expense can vary depending on the stage of preclinical candidates, the nature and amount of testing required and the cost variation of different in vivo testing models. The increase in vivo studies expense is the result of the timing of discovery studies being completed between periods.

Drug manufacturing expense decreased by $53,000 from $7,430,000 during the three months ended March 31, 2019 to $7,377,000 during the current period. Drug manufacturing expense decreased by $749,000 from $13,234,000 during the six months ended March 31, 2019 to $12,485,000 during the current period. The decrease in the expense primarily relates to the timing of manufacturing campaigns in preparation for our candidate clinical trials and toxicology studies. We anticipate this expense to increase as the volume of candidates in our pipeline increases and as each candidate progresses through clinical trial phases.

Toxicity/efficacy studies expense decreased by $239,000 from $2,410,000 during the three months ended March 31, 2019 to $2,171,000 during the current period. Toxicity/efficacy studies expense increased by $1,302,000 from $4,821,000 during the six months ended March 31, 2019 to $6,123,000 during the current period. This category includes IND-enabling toxicology studies as well as post-IND toxicology studies, such as long-term toxicology studies, and other efficacy studies. The change in the expense primarily relates to toxicology studies for ARO-ANG3, ARO-APOC3, ARO-HIF2 and ARO-HSD as each candidate progresses through and into clinical trials. We anticipate this expense to increase as we prepare to enter clinical trials with our other drug candidates.

Clinical trials expense increased by $2,063,000 from $3,205,000 during the three months ended March 31, 2019 to $5,268,000 during the current period. Clinical trials expense increased by $4,188,000 from $5,447,000 during the six months ended March 31, 2019 to $9,635,000 during the current period. The increase in the expense is primarily due to the ongoing ARO-AAT and JNJ-3989 (ARO-HBV) clinical trials, and the progression of the ARO-ANG3 and ARO-APOC3 clinical trials, and the start up of the ARO-HSD and ARO-HIF2 clinical trials. We anticipate this expense to increase as our current clinical candidates progress through clinical trials and as we enter clinical trials with our other drug candidates.

License, royalty and milestones expense increased by $900,000 from $0 during the three months ended March 31, 2019 to $900,000 during the current period. License, royalty and milestones expense increased by $903,000 from $0 during the six months ended March 31, 2019 to $903,000 during the current period. This category includes milestone payments which can vary from period to period depending on the nature of our various license agreements, and the timing of reaching various development milestones requiring payment. During the three and six months ended March 31, 2020, the Company accrued a $0.9 million milestone payment related to the progression of the ARO-ENaC program. During the three and six months ended March 31, 2019, the Company did not accrue for any milestone payments.

Facilities expense increased by $40,000 from $783,000 during the three months ended March 31, 2019 to $823,000 during the current period. Facilities expense increased by $78,000 from $1,366,000 during the six months ended March 31, 2019 to $1,444,000 during the current period This category includes rental costs for our research and development facility in Madison, Wisconsin. The increase in the expense is primarily due to increased rental and common area maintenance expenses for our research and development facility.

Depreciation and amortization expense, a non-cash expense, increased by $49,000 from $1,170,000 during the three months ended March 31, 2019 to $1,219,000 during the current period. Depreciation and amortization expense, a non-cash expense, decreased by $12,000 from $2,342,000 during the six months ended March 31, 2019 to $2,330,000 during the current period. The majority of depreciation and amortization expense relates to depreciation on lab equipment at our Madison research facility. In addition, the Company records depreciation on leasehold improvements at its Madison research facility. Depreciation and amortization expense was relatively consistent in both the three month and six month periods.

Other research expense increased by $2,620,000 from $1,120,000 during the three months ended March 31, 2019 to $3,740,000 during the current period. Other research expense increased by $3,644,000 from $2,079,000 during the six months ended March 31, 2019 to $5,723,000 during the current period. This category includes the following costs to support discovery efforts and the advancement of current drug candidates: in-house laboratory supplies, outsourced labs services, and other miscellaneous research and development expenses. The increase in other research expense is due to additional in-house laboratory supplies for our increased headcount and partially due to equipment purchased for the new San Diego research and development facility.

General & Administrative Expenses

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

(in thousands)

	Three Months Ended March 31, 2020	% of Expense Category	Three Months Ended March 31, 2019	% of Expense Category	Increase (Decrease) $	Increase (Decrease) %
Salaries	$ 3,033	19%	$ 1,579	30%	$ 1,454	92%
Stock compensation	10,019	61%	1,720	32%	8,299	483%
Professional/outside services	1,677	10%	1,362	26%	315	23%
Facilities related	418	3%	265	5%	153	58%
Depreciation/amortization	153	1%	6	0%	147	2450%
Other G&A	1,026	6%	407	8%	619	152%
Total	$ 16,326	100%	$ 5,339	100%	$ 10,987	206%

	Six Months Ended March 31, 2020	% of Expense Category	Six Months Ended March 31, 2019	% of Expense Category	Increase (Decrease) $	Increase (Decrease) %
Salaries	$ 7,114	26%	$ 3,667	32%	$ 3,447	94%
Stock compensation	13,349	49%	3,797	33%	9,552	252%
Professional/outside services	3,499	13%	2,581	23%	918	36%
Facilities related	1,211	4%	563	5%	648	115%
Depreciation/amortization	302	1%	11	0%	291	2645%
Other G&A	1,785	7%	860	8%	925	108%
Total	$ 27,260	100%	$ 11,479	100%	$ 15,781	137%

Salaries expense increased by $1,454,000 from $1,579,000 during the three months ended March 31, 2019 to $3,033,000 during the current period. Salaries expense increased by $3,447,000 from $3,667,000 during the six months ended March 31, 2019 to $7,114,000 during the current period. The increase in the expense is primarily driven by annual merit increases, performance bonuses and increased headcount.

Stock compensation expense, a non-cash expense, increased by $8,299,000 from $1,720,000 during the three months ended March 31, 2019 to $10,019,000 during the current period. Stock compensation expense, a non-cash expense, increased by $9,552,000 from $3,797,000 during the six months ended March 31, 2019 to $13,349,000 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 expense is primarily due to the timing of the achievement of certain performance-based awards in each period.

Professional/outside services include legal, accounting, consulting, patent expenses, business insurance expenses and other outside services retained by the Company. Professional/outside services expense increased by $315,000 from $1,362,000 during the three months ended March 31, 2019 to $1,677,000 during the current period. Professional/outside services expense increased by $918,000 from $2,581,000 during the six months ended March 31, 2019 to $3,499,000 during the current period. The increases in the expense in the three and six month periods are primarily related to recruiting fees for increased headcount.

Facilities-related expense increased by $153,000 from $265,000 during the three months ended March 31, 2019 to $418,000 during the current period. Facilities-related expense increased by $648,000 from $563,000 during the six months ended March 31, 2019 to $1,211,000 during the current period. This category primarily includes rental costs for our corporate headquarters in Pasadena, California. The increase in the expense is primarily related to costs incurred as we moved into our new corporate headquarters during the current period.

Depreciation and amortization expense, a noncash expense, increased by $147,000 from $6,000 during the three months ended March 31, 2019 to $153,000 during the current period. Depreciation and amortization expense, a noncash expense, increased by $291,000 from $11,000 during the six months ended March 31, 2019 to $302,000 during the current period. The majority of general and administrative depreciation and amortization expense relates to depreciation on leasehold improvements at our Pasadena headquarters. The increase in the expense is primarily related to amortization of leasehold improvements for our new corporate headquarters.

Other G&A expense increased by $619,000 from $407,000 during the three months ended March 31, 2019 to $1,026,000 during the current period. Other G&A expense increased by $925,000 from $860,000 during the six months ended March 31, 2019 to $1,785,000 during the current period. This category consists primarily of travel, communication and technology, office expenses, and franchise and property tax expenses. The increase in the expense was due to increased communication and technology and office expenses associated with our new corporate headquarters.

Other Income / Expense

Other income / expense was income of $2,404,685 and $1,886,290 during the three months ended March 31, 2020 and 2019, respectively. Other income / expense was income of $4,584,550 and $2,977,399 during the six months ended March 31, 2020 and 2019, respectively. Other income / expense in the both periods was interest income earned on the Company's investments. This interest income has increased in the current periods as our investment holdings have grown.

Liquidity and Cash Resources

Arrowhead has historically financed its operations through the sale of its equity securities. 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 March 31, 2020, the Company had cash on hand of approximately $256.7 million as compared to $221.8 million at September 30, 2019. Excess cash invested in short-term fixed income securities was $51.0 million at March 31, 2020, compared to $36.9 million at September 30, 2019. Excess cash invested in long-term fixed income securities was $190.6 million at March 31, 2020, compared to $44.2 million at September 30, 2019. 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 six months ended March 31, 2020 and 2019 is as follows:

	Six Months Ended March 31, 2020	Six Months Ended March 31, 2019
Cash Flow from Continuing Operations:		
Operating Activities	$ (51,114,395)	$ 148,698,255
Investing Activities	(168,849,557)	(78,973,570)
Financing Activities	254,810,551	61,781,310
Net Increase (Decrease) in Cash	34,846,599	131,505,995
Cash and Cash Equivalents at Beginning of Period	221,804,128	30,133,213
Cash and Cash Equivalents at End of Period	$ 256,650,727	$ 161,639,208

During the six months ended March 31, 2020, the Company used $51.1 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 $168.8 million, which was primarily related to the purchase of fixed-income investments of $180.5 million and property and equipment of $7.9 million, partially offset by maturities of fixed-income securities of $19.6 million. Cash provided by financing activities of $254.8 million was driven by the securities financing in December 2019, which generated $250.5 million in net cash proceeds, as well as $4.3 million in cash received from stock option exercises.

During the six months ended March 31, 2019, the Company generated $148.7 million in cash from operating activities, which was primarily related to the $175.0 million upfront payment received from Janssen and the premium JJDC paid on the Company's common stock during the period. These inflows were partially offset by approximately $41 million of cash used for the ongoing expenses of the Company's research and development programs and general and administrative expenses. Cash used in investing activities was $79.0 million, which was primarily related to purchases of fixed-income investments of $90.3 million. Cash provided by financing activities of $61.8 million was driven by the equity investment the Company received from JJDC during the period.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements or relationships.

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, 2019.

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. We disclosed information about certain of our legal proceedings in Part I, Item 3 of our Annual Report on Form 10-K for the year ended September 30, 2019.

ITEM 1A. Risk Factors

The disclosure below supplements the risk factors described in our Annual Report on Form 10-K for the year ended September 30, 2019. 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, 2019, 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.

Our results of operations and financial condition may be adversely affected by the novel coronavirus (COVID-19) pandemic and other public health epidemics.

Our business and its operations, including but not limited to our research and development activities and our supply chain, could be adversely affected by health epidemics in regions where we have business operations, and such health epidemics could cause significant disruption in the operations of third parties upon whom we rely. In December 2019, a novel strain of coronavirus, SARS-CoV-2, causing a disease referred to as COVID-19, was reported to have surfaced in Wuhan, China. Since then, COVID-19 has spread to other countries, including the United States, and has been declared a pandemic by the World Health Organization. In response to public health directives and orders related to COVID-19, we have implemented work-from-home policies for substantially all of our employees to the extent work can be performed effectively at home. The effects of executive and similar government orders, shelter-in-place orders and our work-from-home policies may negatively impact our productivity, disrupt our business, increase our expenses, including costs associated with preventive and precautionary measures that we, companies with which we conduct business, and governments are taking, and delay our clinical trials and timelines, the magnitude of which will depend, in part, on the length and severity of the restrictions and other limitations on our ability to conduct our business in the ordinary course. These and similar, and perhaps more severe, disruptions in our operations could negatively impact our business, results of operations and financial condition.

Quarantines, shelter-in-place, executive and similar government orders, or the perception that such orders, shutdowns or other restrictions on the conduct of business operations could occur, related to COVID-19 or other infectious diseases, have impacted and may continue to impact personnel at our business partners in the United States and other countries, or our access to raw materials for our research and development facility discovery efforts, which would disrupt our supply chain.

In addition, our clinical trials have been and may continue to be affected by the COVID-19 pandemic. For example, we have paused enrollment in our two ARO-AAT studies: SEQUOIA and the ARO-AAT 2002 study. If COVID-19 continues to spread in the United States and elsewhere, we may experience additional disruptions that could severely impact our business, preclinical studies and clinical trials, including:

- delays in receiving authorization from local regulatory authorities to initiate any planned clinical trials;
- delays or difficulties in enrolling patients in our clinical trials;
- delays or difficulties in clinical site initiation, including difficulties in recruiting clinical site investigators and clinical site staff;
- delays in clinical sites receiving the supplies and materials needed to conduct our clinical trials, including interruption in global shipping that may affect the transport of clinical trial materials;
- changes in local regulations as part of a response to the COVID-19 pandemic which may require us to change the ways in which our clinical trials are conducted, which may result in unexpected costs, or to discontinue the clinical trials altogether;
- diversion of healthcare resources away from the conduct of clinical trials, including the diversion of hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our clinical trials;
- interruption of key clinical trial activities, such as clinical trial site monitoring and data entry and verification, due to limitations on travel imposed or recommended by federal or state governments, employers and others, or interruption of

clinical trial subject visits and study procedures, the occurrence of which could affect the completeness and integrity of clinical trial data and, as a result, the determine the outcomes of the trial;

- risk that participants enrolled in our clinical trials will acquire COVID-19 while the clinical trial is ongoing, which could impact the results of the clinical trial, including by increasing the number of observed adverse events;
- risk that participants enrolled in our clinical trials will not be able to travel to our clinical trial sites as a result of quarantines or other restrictions resulting from COVID-19;
- risk that participants enrolled in our clinical trials will not be able to comply with clinical trial protocols if quarantines impede patient movement or interrupt healthcare services;
- interruptions or delays in preclinical studies due to restricted or limited operations at our research and development laboratory facilities;
- delays in necessary interactions with local regulators, ethics committees and other important agencies and contractors due to limitations in employee resources or forced furlough of government employees;
- limitations in employee resources that would otherwise be focused on the conduct of our clinical trials, including because of sickness of employees or their families or the desire of employees to avoid contact with large groups of people;
- refusal of the FDA to accept data from clinical trials in affected geographies; and
- interruption or delays to our clinical activities.

The spread of COVID-19, which has caused a broad impact globally, may materially affect us economically. While the potential economic impact brought by COVID-19, and the duration of such impact, may be difficult to assess or predict, the widespread pandemic has resulted in significant disruption of global financial markets, which could reduce our ability to access capital and negatively affect our future liquidity. In addition, a recession or market correction resulting from the spread of COVID-19 and related government orders and restrictions could materially affect our business and the value of our common stock.

The COVID-19 pandemic continues to evolve rapidly. The ultimate impact of the COVID-19 pandemic or a similar public health emergency is highly uncertain and subject to change. We do not yet know the full extent of potential delays or impacts on our business, our clinical trials, healthcare systems, or the global economy as a whole. However, any one or a combination of these events could have an adverse effect on our results of operations and financial condition

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	Sublease agreement by and between Halozyme, Inc. and Arrowhead Pharmaceuticals Inc. dated March 3, 2020*†
31.1	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*
31.2	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*
32.1	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**
32.2	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**
101.SCH	XBRL Taxonomy Extension Schema Document*
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document*
101.LAB	XBRL Taxonomy Extension Label Linkbase Document*
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document*
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document*
104	The cover page from the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2020, 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: May 7, 2020

ARROWHEAD PHARMACEUTICALS, INC.

By: /s/ Kenneth A. Myszkowski
Kenneth A. Myszkowski
Chief Financial Officer

Exhibit 10.1

SUBLEASE

THIS SUBLEASE (this "Sublease") is dated as of the 3rd day of March 2020 (the "Sublease Commencement Date"), between HALOZYME, INC., a California corporation, with offices at 11388 Sorrento Valley Road, San Diego, California 92121 ("Sublandlord"), and ARROWHEAD PHARMACEUTICALS, INC., a Delaware corporation, with offices at 177 E. Colorado Blvd., Suite 700, Los Angeles, California 91101 ("Subtenant").

RECITALS

WHEREAS, Sublandlord is the tenant of certain premises consisting of approximately 21,060 rentable square feet of space at 11404 Sorrento Valley Road, San Diego, California (the "Building"), pursuant to a lease dated as of June 10, 2011, with BMR-SORRENTO PLAZA LLC, as landlord ("Prime Landlord", such lease as amended from time-to-time, being referred to as the "Prime Lease"). A copy of the Prime Lease and all amendments thereto entered into as of the Sublease Commencement Date are annexed hereto as Exhibit A;

WHEREAS, Section 28.1 of the Prime Lease permits Sublandlord to sublease the Building with Prime Landlord's prior written consent; and

WHEREAS, Subtenant wishes to sublet from Sublandlord the Building, as more particularly described on the floor plan annexed hereto as Exhibit B and being referred to as the "Subleased Premises".

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Sublandlord and Subtenant agree as follows:

1. Term.

(a) Subject to and in accordance with all of the terms, covenants and conditions of this Sublease, Sublandlord hereby subleases the Subleased Premises to Subtenant, and Subtenant hires and accepts the Subleased Premises from Sublandlord, for a term (the "Sublease Term") to commence on the Sublease Commencement Date; which is the later of i) April 1, 2020 or ii) the Monday immediately following Subtenant's receipt of Master Landlord's Consent to Sublease, and to expire on January 14, 2023 (the "Sublease Expiration Date"), both dates inclusive, unless the Sublease Term shall sooner end pursuant to any of the terms, covenants and conditions of this Sublease or the Prime Lease.

(b) In the event that Sublandlord is unable to deliver possession of the Subleased Premises to Subtenant or is delayed in delivering possession of Subleased Premises due to factors beyond Sublandlord's control (including, without limitation, Prime Landlord's failure to deliver its consent to this Sublease in a timely manner), Sublandlord shall not be subject to any liability therefor and the validity of this Sublease shall not be impaired.

(c) Subtenant shall have the ability to enter and occupy the Subleased Premises, without rent due prior to the Sublease Commencement Date for the purposes of installing equipment, furniture, fixtures and cabling. During said early occupancy, at any time prior to the time Subtenant is operating its business on the Subleased Premises, Subtenant shall not be responsible for Sublease Rent or operating expenses. For the avoidance of doubt, if at any time during said early occupancy Subtenant commences business operations, Subtenant shall be responsible for paying Sublandlord Sublease Rent and for operating expenses of the Subleased Premises.

2. Use. Subtenant shall use the Subleased Premises solely for general office and laboratory use and for no other use unless Sublandlord provides its prior written consent. Subtenant shall not use or conduct its operations at the Subleased Premises or common areas in any manner that would breach or violate the terms of the Prime Lease or this Sublease.

3. Rent.

(a) From and after the Sublease Commencement Date, Subtenant shall pay to Sublandlord the base rent specified in subsection 3(b) below ("Base Rent"). Base Rent and all other items of additional rent, charges and expenses payable by Subtenant hereunder (collectively, "Rent") shall be paid to Sublandlord on the first day of each calendar month during the Sublease Term (unless otherwise specifically provided herein), without deduction, abatement, counterclaim or setoff of any amount for any reason whatsoever. Rent shall be paid to Sublandlord in lawful money of the United States by electronic funds transfer (wire transfer or ACH) to the following account:

[***]

Or to such other account(s) as Sublandlord may specify from time to time. Subtenant will complete and execute any documentation that Sublandlord reasonably may require to effectuate payment of Rent. Any payment by Subtenant or receipt by Sublandlord of an amount less than the amount stipulated hereunder for any portion of Rent shall be deemed a payment on account of such amount(s) payable. Any provision in the Prime Lease referring to "Minimum Monthly Rent", "Additional Rent," or "rent" (or words of similar meaning) incorporated herein by reference shall be deemed to refer to all items of Rent due under this Sublease.

(b) Base Rent shall consist of the following amounts, and shall be paid by Subtenant to Sublandlord as herein provided:

[***]

(c) Notwithstanding subsection 3(b) above, Subtenant's obligation to pay Rent shall commence on the Sublease Commencement Date and shall be adjusted on a daily prorated basis in the event the Sublease Commencement Date occurs after April 1, 2020 in accordance with Section 1(a) above. Rent payable hereunder shall be prorated on a daily basis in the case of any period of less than a full calendar year or, in the case of any monthly installment, any period less than a full calendar month. Subtenant shall pay all commercial rent or occupancy taxes imposed in connection with this Sublease, the Subleased Premises or the payment of Rent hereunder, if applicable.

(d) From and after the Possession Date, Subtenant shall be responsible for Subtenant's utilities and janitorial services.

(e) Notwithstanding the above, Subtenant shall receive two (2) months of Fifty Percent (50%) Base Rent abatement, to be realized during months 2 and 3 of the Sublease Term.

4. Additional Payments by Subtenant. Consistent with the terms above, Subtenant shall be responsible for paying for Subtenant's Pro Rata Share of charges for all common area maintenance ("CAM") including items such as trash removal and landscaping and billed to Sublandlord by Prime Landlord, utilities and other services provided to Subtenant or to the Subleased Premises by or on behalf of Prime Landlord to the extent such utilities, services, materials and other items are not provided without charge pursuant to the Prime Lease. Tenant is aware that some CAM expenses will be pro-rated as there are services provided covering both the 11404 and 11408 buildings. If Subtenant shall request any other service for which a charge is imposed pursuant to the Prime Lease or otherwise by Prime Landlord, Subtenant shall either pay the full amount of such charge within ten (10) days after demand therefor (i) to Prime Landlord if Prime Landlord bills Subtenant directly for such services, or (ii) to Sublandlord if Prime Landlord bills Sublandlord for such services. Sublandlord and Subtenant shall request that Prime Landlord forward copies of invoices for such services directly to Subtenant, with copies sent to Sublandlord. On the first day of each calendar month during the Sublease Term, Subtenant shall pay Subtenant's Pro Rata Share of utilities and janitorial services by depositing with Sublandlord an amount equal to one twelfth (1/12th) of the estimated annual Subtenant's Pro Rata Share of such expenses due from Subtenant as reasonably determined by Sublandlord from time to time during the Sublease Term and as set forth in a written notice to Subtenant. Subtenant shall pay for all maintenance and repairs to the building systems as it is written in the Prime Lease, including the provisions of Section 17 of the Prime Lease, and will be obligated to perform routine maintenance and provide backup records per the Prime Lease. Subtenant shall pay Sublandlord a security deposit on the

Sublease Commencement Date consisting of the Base Rent for the final month of Base Rent and a mutually agreed upon good faith estimate of expenses to be incurred by Subtenant during the final month of the term of this Sublease. For purposes of this Sublease, the term "Subtenant's Pro Rata Share" shall be defined as a ratio, the numerator being the rentable square footage of the Subleased Premises (i.e. 21,060) and the denominator being the rentable square footage of the total rentable square footage under the Prime Lease (i.e.30,371). As of the date hereof, Subtenant's Pro Rata Share is 69.34%. Subtenant's Pro Rata Share of CAM, utilities, materials and janitorial services will for all purposes be treated and considered Additional Rent and the failure of Subtenant to pay the same as and when due will have the same effect as failure to pay any installment of Base Rent and will afford Sublandlord all the remedies in this Sublease therefor as well as at law or in equity. For avoidance of doubt, Subtenant shall be responsible for all maintenance and repairs for the Building during the term of this Sublease. With respect to Subtenant's obligation to pay utilities for the Leased Premises, Subtenant shall pay all of the monthly utility bills, including electricity, water and gas except for $100 of each monthly electricity bill, which shall be paid by Sublandlord. Upon Sublandlord's subleasing of the neighboring building located 11408 Sorrento Valley Road, Subtenant's obligation to pay utilities shall be prorated based upon Subtenant's utility run rate. For a period of ninety (90) days, or such other time period as the parties shall subsequently agree in writing, Subtenant shall be permitted access to use Sublandlord's internet service for the limited purpose of carrying on Subtenant's business. Subtenant shall reimburse, indemnify, save, defend (at Sublandlord's option and with counsel reasonably acceptable to Sublandlord) and hold harmless Sublandlord for, from and against any and all Claims imposed upon or incurred by or asserted against Sublandlord and directly or indirectly arising out of or in any way relating to Subtenant's use of Sublandlord's internet service. Subtenant agrees that Sublandlord shall have no liability whatsoever in connection with Subtenant's use of Sublandlord's internet service.

5. Late Charges. If Subtenant shall fail to pay any installment of Rent or any other sum payable under this Sublease within five (5) days after the date when such amount is due, Subtenant shall pay to Sublandlord (in addition to such installment of Rent or other sum, as the case may be) as a late charge, an amount equal to (i) six percent (6%) of the amount unpaid plus (ii) 1.5% per month of the amount unpaid, computed from the due date of such payment to and including the date when such payment is actually made to Sublandlord; provided, however, that the total amount of such late charges shall not exceed the maximum late charge permitted by applicable law. The late charges for any month shall be paid to Sublandlord within five (5) days after demand therefore. In the case of any default in payment of any late charges by Subtenant, and in addition to all other remedies, Sublandlord shall have the same rights as provided in this Sublease (including the Prime Lease provisions incorporated by reference) for nonpayment of Rent. Nothing in this Section, and no acceptance of late charges by Sublandlord, shall be deemed to extend or change the time for payment of Rent.

6. Subordination to the Prime Lease; Prime Landlord's Consent.

(a) This Sublease is subject and subordinate to the Prime Lease and to each exception, encumbrance, lien or other matter to which the Prime Lease is or shall be subordinate. In the event of lawful termination of this Sublease, re-entry or dispossession by Prime Landlord under the Prime Lease, Prime Landlord may take over all of the right, title and interest of Sublandlord, as sublessor under this Sublease, and Subtenant shall attorn to Prime Landlord pursuant to the then executory provisions of this Sublease, except that the Prime Landlord shall not be (i) liable for any previous act or omission of Sublandlord under this Sublease, (ii) subject to any counterclaim, offset or defense not expressly provided in this Sublease (which theretofore accrued to Subtenant against Sublandlord), (iii) bound by any previous prepayment of more than one (1) month's Rent, or (iv) bound by any covenant to undertake or complete or make payment to or on behalf of Subtenant including with respect to any construction the Subleased Premises.

(b) Sublandlord shall use reasonable efforts (but without any obligation to incur any expense or to commence any litigation) to deliver to Subtenant the written consent of Prime Landlord to this Sublease, if the Prime Landlord's consent to this Sublease is required by the Prime Lease (such consent being referred to as the "Consent"). Subtenant shall cooperate with Sublandlord in seeking the Consent, including, without limitation, supplying all information and documentation reasonably requested by Prime Landlord with respect to Subtenant. Subtenant shall pay any fee of Sublandlord in connection therewith (if so required by Sublandlord) and shall occupy and use the Subleased Premises subject to the terms thereof. In the event Prime Landlord fails or refuses to deliver the Consent, all sums paid

to Sublandlord by Subtenant (other than with respect to the Consent) shall be returned to Subtenant (without interest) and neither party shall have any further rights or liabilities hereunder except as specifically provided herein to the contrary.

7. Incorporation by Reference.

(a) Subject to the provisions of this Sublease, the terms and conditions of the Prime Lease (including, without limitation, the remedies thereunder) are hereby incorporated by this Sublease and made a part hereof with the same force and effect as if such terms and conditions were completely set forth herein, and as if the words "Landlord" and "Tenant", or words of similar import, wherever the same appear in the Prime Lease, were construed to mean, respectively, Sublandlord and Subtenant under this Sublease, and as if the word "Premises", or words of similar import, wherever the same appear in the Prime Lease, were construed to mean the Subleased Premises under this Sublease, and as if the word "Lease", or words of similar import, wherever the same appear in the Prime Lease, were construed to mean this Sublease, and as if the word "Term", or words or similar import, wherever the same appear in the Prime Lease, were construed to mean the Sublease Term under this Sublease. From and after the Sublease Commencement Date, Subtenant shall undertake to perform and observe all the terms, obligations, covenants and conditions of the tenant under the Prime Lease. The time limits contained in the Prime Lease for the giving of notices, making of demands or performing any act, condition or covenant on the part of the tenant thereunder, or for the exercise by the tenant thereunder of any right (including any right to cure a default), remedy or option, are changed for the purposes of incorporation herein by shortening the same by five (5) days in each instance, unless such time limit is five (5) days or less, in which event such period shall be shortened by two (2) days (but in no event shall such time limit be shortened pursuant to this subsection to less than three (3) days), so that notices may be given, demands made, any act, condition or covenant performed, and any right, remedy or option hereunder exercised by Sublandlord within the time limit relating thereto contained in the Prime Lease. Notwithstanding anything to the contrary in this Sublease, if any of the express provisions of this Sublease shall conflict with any of the provisions of the Prime Lease incorporated herein by reference, such conflict shall be resolved in every instance in favor of this Sublease; however, nothing contained in this Sublease shall be deemed, in any way, to modify any of the provisions of the Prime Lease or Sublandlord's obligations under the Prime Lease.

(b) All capitalized words and phrases not otherwise defined or described in this Sublease shall have the meanings ascribed to them in the Prime Lease.

8. Performance by Sublandlord.

(a) Subtenant shall not have any rights in respect of the Subleased Premises greater than Sublandlord's rights under the Prime Lease with respect thereto. Notwithstanding anything to the contrary in this Sublease, Sublandlord shall have no liability to Subtenant by reason of any default of Prime Landlord (as to obligations of Sublandlord contained in this Sublease by the incorporation by reference of any provision of the Prime Lease), it being understood that if Sublandlord shall fail to fulfill any obligation of Prime Landlord hereunder and such failure is caused by the failure of Prime Landlord to comply with its obligations under the Prime Lease, then Sublandlord shall have no obligation or liability by reason of such failure. Subtenant expressly acknowledges that all of the services provided to the Building and the Subleased Premises are supplied by Prime Landlord, that Sublandlord has no control thereof and assumes no responsibility in connection therewith and that no such failure or interruption shall give rise to any (i) abatement, diminution or reduction of Subtenant's obligations under this Sublease, (ii) constructive eviction, whether in whole or in part, or (iii) liability on the part of Sublandlord, unless and to the extent such failure or interruption is directly attributable only to the gross negligence or willful misconduct of Sublandlord.

(b) Sublandlord shall not be required to make any payment or perform any obligation, and shall have no liability to Subtenant for any matter whatsoever, except for Sublandlord's obligations:

(i) to pay the Base Rent and Additional Rent due under the Prime Lease (provided Subtenant is not in default in the payment of Rent payable under this Sublease);

(ii)to use reasonable efforts, upon written request of Subtenant, to cause Prime Landlord to observe and perform its obligations under the Prime Lease with respect to the Subleased Premises (provided that Sublandlord shall not be required to incur any expense or liability in connection therewith and shall not be obligated to commence any litigation); and

(iii)provided that Subtenant is not in default under this Sublease, not to take any action that would cause a default by Sublandlord as tenant under the Prime Lease.

(c) Sublandlord hereby represents to Subtenant that, as of the date hereof, the Prime Lease is in full force and effect.

9. No Breach of the Prime Lease. Subtenant shall not do, or permit to be done, any act or thing which may constitute a breach or violation of any provision of the Prime Lease, whether or not such act or thing is permitted under the provisions of this Sublease.

10. Indemnification. Subtenant shall indemnify, defend and hold Sublandlord harmless from and against all loss, cost, damage, expense and liability, including, without limitation, reasonable attorneys' fees and disbursements, which Sublandlord may incur by reason of: (i) any accident, damage or injury to any person or property occurring in, on or about the Subleased Premises from and after the earlier of (a) the Sublease Commencement Date or (b) the date on which Subtenant accesses the Subleased Premises; (ii) any breach or default under this Sublease by Subtenant; (iii) any work done in or to the Subleased Premises, either by or on behalf of Subtenant after the Sublease Commencement Date; or (iv) any act, omission or negligence by Subtenant or any of its officers, employees, agents, customers, licensees or invitees, or any person claiming through or under Subtenant; provided, however, and notwithstanding anything to the contrary contained in this Section, Subtenant shall not be obligated to indemnify Sublandlord against any such loss, cost, damage, expense or liability to the extent directly caused by Sublandlord's negligence or willful misconduct.

11. Condition of the Subleased Premises. Subtenant agrees to accept the Subleased Premises in its "as is" condition on the Sublease Commencement Date and acknowledges that Sublandlord shall have no obligation to perform any work or to make any installations in order to prepare the Subleased Premises for Subtenant's occupancy, except as otherwise provided herein. The taking of possession of the Subleased Premises by Subtenant shall be conclusive evidence as against Subtenant that, at the time such possession was so taken, the Subleased Premises and the Building were in good and satisfactory condition. Sublandlord shall remove any and all hazardous materials and guarantee the decommissioning of the premises.

12. Access. Sublandlord or Sublandlord's agents shall have the right to enter the Subleased Premises at all reasonable times, upon giving Subtenant reasonable advance notice and signing standard confidentiality documents that might reasonably be required by Subtenant, to perform its obligations and exercise its rights under this Sublease or the Prime Lease.

13. Consents and Approvals. In any instance when Sublandlord's consent or approval is required under this Sublease, Sublandlord's refusal to consent to or approve any matter or thing shall be deemed reasonable if, among other things, Sublandlord has made a good faith effort to obtain the consent or approval to such matter or thing of Prime Landlord and such consent or approval was not obtained. If Subtenant shall seek the approval or consent by Sublandlord and Sublandlord shall fail or refuse to give such approval or consent, Subtenant's sole remedy shall be an action for injunction or specific performance with respect thereto (and such remedy shall be available only in those cases where Sublandlord shall have expressly agreed herein not to unreasonably withhold or delay its consent).

14. Assignment and Subletting.

(a) Subtenant shall not, by operation of law or otherwise, assign, sell, mortgage, pledge or in any manner

transfer this Sublease or any interest therein, or sub-sublet any portion of the Subleased Premises, without the prior written consent of Sublandlord and Prime Landlord in each instance, which consent may be withheld in the sole and absolute discretion of Sublandlord or Prime Landlord; provided further that Sublandlord shall have the right to withhold its consent to any proposed assignee or sublessee that is in the same business as Sublandlord. To the extent the rentals or income derived from any sublease or assignment exceed the rentals due hereunder, fifty percent (50%) of such excess rentals and income shall be paid to Sublandlord after Subtenant deducts its reasonable out of pocket costs incurred in connection with such sublease or assignment, including, without limitation, leasing commissions, leasehold improvements, costs and allowances and legal fees.

(b) If this Sublease shall be assigned or if the Subleased Premises or any portion thereof shall be sublet or occupied by any person(s) other than the original Subtenant named herein, then Sublandlord may collect rent from any such assignee, subtenant or occupant, and apply the net amounts collected to Rent payable pursuant to this Sublease, but no such assignment, occupancy or collection shall be deemed a waiver of any of the provisions of this Section, an acceptance of the assignee, subtenant or occupant as subtenant hereunder, or a release of any person from the further performance by such person of the obligations of Subtenant under this Sublease. A transfer of control of Subtenant, including, without limitation, a transfer of stock or partnership interest, the merger, consolidation or sale of all or substantially all of the assets of Subtenant or other corporate or other reorganization of Subtenant (whether or not Subtenant shall be the surviving entity), shall be deemed an assignment under this Sublease and shall be subject to all the provisions of this Section. The consent by Sublandlord and Prime Landlord to any assignment, mortgage, pledge, encumbrance, transfer or subletting shall not constitute a waiver of the necessity for such consent to any subsequent assignment, mortgage, pledge, encumbrance, transfer or subletting. The term “control” means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of such entity, throughout the ownership of at least twenty-five percent (25%) of the legal and beneficial interest in such entity. No such assignment or subletting shall cause Subtenant to be released from its obligations under this Sublease. Any proposed assignment or subletting shall be subject to the restrictions regarding assignment and subletting contained in the Prime Lease and the rights of Prime Landlord thereunder.

(c) No Sublease of the Subleased Premises shall release or change Subtenant’s liability to pay Rent and perform its obligations under this Sublease. If any assignee or subtenant defaults under this Sublease, Sublandlord may proceed directly against the Subtenant without pursuing remedies against the subtenant or assignee.

15. Insurance. Without limiting any of the provisions of the Prime Lease, Subtenant shall maintain throughout the Sublease Term, for the benefit of Sublandlord and Prime Landlord as additional insureds, such insurance as Sublandlord may be required to provide pursuant to the Prime Lease, provided that Subtenant shall only be required to provide insurance with respect to the Subleased Premises. Certificates of all such polices shall be delivered to Sublandlord on or before the Sublease Commencement Date. All insurance required to be carried by Subtenant pursuant to this Sublease shall be effected under valid and enforceable polices issued by independent insurers permitted to do business in California reasonably acceptable to Sublandlord.

16. Alterations.

(a) Subtenant shall not make or cause, or suffer or permit the making of, any alteration, addition, change, replacement, installation or addition in or to the Subleased Premises without obtaining the prior written consent of Sublandlord and Prime Landlord thereto in each instance which consent may be withheld in their sole and absolute discretion. Any permitted changes shall be made only in compliance with the Prime Lease. Notwithstanding anything to the contrary contained herein or in the Prime Lease, at the end of the Sublease Term, Subtenant shall surrender the Subleased Premises in the condition existing as of the Sublease Commencement Date, reasonable wear and tear excepted, with all originally painted interior walls cleaned, and repaired or replaced if damaged, all carpets shampooed and cleaned, the air conditioning and heating equipment in good order and repair, all floors cleaned and waxed, all to the reasonable satisfaction of Sublandlord and the Prime Landlord. If requested by Landlord or Prime Landlord prior to the expiration of the Sublease term, Subtenant shall remove any and all improvements, additions or installations made at the Subleased Premises and shall restore the Subleased Premises to the condition that existed prior to such improvement. In the event that Subtenant fails to restore the Subleased Premises as required by the immediately preceding sentence, Sublandlord

may perform such restoration and all costs incurred by Sublandlord shall be reimbursed to Sublandlord by Subtenant, as additional rent, not later than five (5) days after Sublandlord's demand therefor. The provisions of this Section shall survive the Sublease Expiration Date or earlier termination of this Sublease.

(b) Prior to making any "Alterations" (as defined in Section 16.1 of the Prime Lease), Subtenant, at its expense, shall (i) submit to Sublandlord and Prime Landlord for its approval, detailed plans and specifications ("Plans") of each proposed Alteration, and allow 15 business days for adequate review and approval by Sublandlord and Prime Landlord (ii) obtain all permits, approvals and certificates required by any applicable governmental authorities, (iii) furnish to Sublandlord certificates of worker's compensation (covering all persons to be employed by Subtenant, and Subtenant's contractors and subcontractors in connection with such Alteration) and commercial general liability (including property damage coverage) insurance and builder's risk coverage all in such form, with such companies, for such periods and in such amounts as Sublandlord may reasonably require, naming Sublandlord and Prime Landlord as additional insureds, and (iv) furnish to Sublandlord reasonably satisfactory evidence of Subtenant's ability to complete and to fully pay for such Alterations.

(c) All Alterations shall be performed (i) in a good and workmanlike manner and free from defects, (ii) substantially in accordance with the Plans, and by contractors approved by Sublandlord and Prime Landlord, (iii) in compliance with all applicable laws, statutes, ordinances, codes, and rules and regulations, the terms of this Sublease and Prime Lease and all construction procedures and regulations then prescribed by Sublandlord and Prime Landlord, including but not limited to the requirement to coordinate the completion of such Alterations with Sublandlord's site facility manager, and (iv) at Subtenant's expense. All materials and equipment shall be of first quality and at least equal to the applicable standards for the Building then established by Sublandlord, and no such materials or equipment shall be subject to any lien or other encumbrance. Upon completion of any Alterations hereunder, Subtenant shall provide Sublandlord with copies of certificates of partial and final approval of such Alterations required by any applicable governmental authority, as-built Plans for such Alterations prepared in CADD or other format acceptable to Sublandlord, and all final unconditional waivers of lien from all contractors, subcontractors, materialmen, suppliers and others having lien rights with respect to such Alterations, in the form prescribed by California law.

(d) Subtenant shall pay to Sublandlord, upon demand, all out-of-pocket costs actually incurred by Sublandlord in connection with Subtenant's Alterations, including costs incurred in connection with (i) Sublandlord's review of the Alterations (including review of requests for approval thereof) and (ii) the provision of Building personnel during the performance of any Alteration, to operate elevators or otherwise to facilitate Subtenant's Alterations.

(e) The approval of Plans, or consent by Sublandlord and Prime Land Landlord to the making of any Alterations, does not constitute Sublandlord's representation that such Plans or Alterations comply with any applicable laws, statutes, ordinances, codes, or rules and regulations. Sublandlord shall not be liable to Subtenant or any other party in connection with Sublandlord's approval of any Plans, or Sublandlord's consent to Subtenant's performing any Alterations. If any Alterations made by or on behalf of Subtenant require Sublandlord to make any alterations or improvements to any part of the Building in order to comply with any applicable laws, statutes, ordinances, codes, or rules and regulations, Subtenant shall pay all costs and expenses incurred by Sublandlord in connection with such alterations or improvements.

17. Parking. In the parking areas serving the Subleased Premises, Subtenant shall be permitted, on an unreserved and nonexclusive basis, the use of the Pro Rata Share of the number of parking spaces available on the premises. Sublandlord currently has three reserved parking spaces on the South side of the Building.

18. Right to Cure Subtenant's Default. If Subtenant shall default in the observance or performance of any term or covenant of this Sublease on Subtenant's part to be observed or performed, and if such default has not been cured following ten (10) days' notice to Subtenant, then Sublandlord may, immediately or at any time thereafter, perform the same for the account of Subtenant. Notwithstanding the preceding provisions of this Section, if: (i) a default of Subtenant hereunder does not constitute a default under the Prime Lease; (ii) such default cannot reasonably be cured within such ten (10) day period; and (iii) such default does not involve Subtenant's failure to pay any amount to Sublandlord pursuant to this Sublease, then Sublandlord shall not be entitled to exercise its remedies pursuant to this Section if Subtenant shall

commence curing such default within such ten (10) day period and shall thereafter cure such default with reasonable diligence (not to exceed, in any event, sixty (60) days). If Sublandlord makes any reasonable expenditure or incurs any obligation for the payment of money in connection therewith (including, without limitation, attorneys' fees and disbursements, in instituting, prosecuting or defending any action or proceeding), then such sums paid, or obligations incurred, with interest (in each such case at the rate of 1.5% per month, but such interest rate shall not in any event exceed the maximum rate permitted by law) shall be deemed to be Additional Rent under this Sublease and shall be paid by Subtenant to Sublandlord within five (5) days after Sublandlord's demand therefor.

19. Brokerage. Each party to this Sublease represents that it dealt with no broker or other person who had any part, or was instrumental in any way, in bringing about this Sublease, other than Cushman & Wakefield (the "Broker") for the Sublandlord and Cresa Partners (the "Broker") for the Subtenant. Each party shall indemnify and hold harmless the other party from and against: (i) all claims made by any other broker or other person for a brokerage commission, finder's fee or similar compensation, on behalf of the indemnifying party and by reason of or in connection with this Sublease; and (ii) all loss, cost, damage, expense or liability (including, without limitation, reasonable attorneys' fees and disbursements) in connection with such claims if such other broker or other person claims to have dealt with or otherwise through the indemnifying party. Sublandlord will pay the Broker's a commission pursuant to a separate agreement between Sublandlord and Broker.

20. Notices. All notices, consents, approvals, demands, requests and other communications (collectively, "Notices") which are required or desired to be given by either party to the other hereunder must be in writing and shall be personally delivered or sent by Federal Express or comparable courier for delivery on the morning of the next business day, and with all delivery or transmission charges prepaid. Notices delivered in the manner provided herein shall be deemed to have been given when delivered or when receipt therefor has been refused. Until such time as Sublandlord shall designate otherwise, all Notices given to Sublandlord shall be addressed to Sublandlord at 11388 Sorrento Valley Rd. San Diego, CA 92121; Attention General Counsel. All Notices given to Subtenant shall be addressed to Subtenant at 177 E. Colorado Blvd., Suite 700, Los Angeles, CA 91105; Attn: General Counsel. Sublandlord and Subtenant may from time to time change the names and/or addresses to which Notices given to such party shall be addressed and sent as aforesaid, by designating such other names and/or addresses in a notice given in accordance with the provisions of this Section.

21. Waiver of Jury Trial. The parties hereby waive trial by jury in any action, proceeding or counterclaim brought by either of them against the other on any matter arising out of or in any way connected with this Sublease, the relationship of Sublandlord and Subtenant, Subtenant's use or occupancy of the Subleased Premises, any claim of injury or damage, or the enforcement of any remedy under any statute. If Sublandlord commences any summary proceeding for nonpayment of Rent required to be made under this Sublease, Subtenant will not interpose any counterclaim (except for mandatory or compulsory counterclaims) of any nature or description in any such proceeding.

22. Holding Over by Subtenant. If Subtenant (including without limitation any subtenant, successor, or assignee of Subtenant, to the extent permitted herein) holds over and remains in possession of the Subleased Premises or any part thereof beyond the termination of the Sublease Term, (a) unless and until Sublandlord and Subtenant have otherwise expressly agreed, such holding over shall under no circumstances be deemed to constitute a tenancy at will, a month-to-month tenancy, or any other form of tenancy, and, instead, such holding over shall be regarded as occurring over Sublandlord's objection, and Subtenant shall be (i) a trespasser without any right to occupy the Subleased Premises, (ii) a tenant at sufferance, or (iii) a holdover tenant, whichever is deemed by the law of the pertinent jurisdiction to hold the least rights to, or estate in, the Subleased Premises, (b) Subtenant shall pay to Sublandlord, as a charge for the occupancy of the Subleased Premises, an amount equal to one hundred seventy-five percent (150%) of the combined total of the monthly Rent and Additional Rent charged under this Sublease for the last month of the Sublease Term, and such payments shall be made on the same schedule and in accordance with the same procedures as were in effect concerning such payments prior to the commencement of such holding over, (c) in addition to and without limiting any other rights and remedies that Sublandlord may have on account of such holding over, Subtenant shall pay to Sublandlord all direct, indirect, and consequential damages, costs, and expenses incurred by Sublandlord as a result of such holding over, including without limitation any costs and expenses that Prime Landlord charges to Sublandlord on account thereof, and (d) indemnify Sublandlord against, and hold Sublandlord harmless from, any damage, loss, claim, liability, or

expense, including without limitation all direct and consequential damages for which Sublandlord is responsible under the Prime Lease and reasonable attorneys' fees, arising out of such holding over.

23. Fire, Casualty, and Eminent Domain. With respect to any damage or destruction by fire or other casualty, or any taking by eminent domain, the provisions of the Prime Lease shall govern, and Sublandlord shall have the right, without Subtenant's consent, to make, in Sublandlord's sole discretion, whatever elections are provided to Sublandlord under the Prime Lease. In the event the Prime Lease is not terminated on account of any such fire or casualty, Subtenant shall be responsible for all restoration required of Sublandlord thereunder as to the Subleased Premises.

24. Sublandlord Liability. Sublandlord shall not be liable to Subtenant for any: (a) acts or omissions of persons occupying the Building; (b) damage to property entrusted to employees of the Building or resulting from any accident or occurrence in the parking area; (c) for loss or damage to any property by theft or otherwise; or (d) any injury or damage to persons or property resulting from any cause of whatsoever nature, unless (and only to the extent) caused by or due to the gross negligence or willful misconduct of Sublandlord.

25. No Waiver. The failure of Sublandlord to insist in any one or more cases upon the strict performance or observance of any obligation of Subtenant under this Sublease, or to exercise any right contained in this Sublease, shall not be construed as a waiver or relinquishment for the future of either any such obligation Subtenant or any right of Sublandlord. The Sublandlord's receipt, and acceptance of performance, of any other obligation by Subtenant, with knowledge of the Subtenant's breach of any provision of this Sublease, shall not be deemed a waiver of such breach. No waiver of any term, covenant or condition of this Sublease shall be deemed to have been made unless expressed in writing and signed by Sublandlord.

26. Complete Agreement. There is no representation, agreement, arrangement or understanding, oral or written, between Sublandlord and Subtenant relating to the subject matter of this Sublease which is not fully expressed in this Sublease. This Sublease cannot be changed or terminated orally or in any manner other than by a written agreement executed by both parties.

27. Successors and Assigns. The provisions of this Sublease, except as herein otherwise specifically provided, shall extend to, bind and inure to the benefit of the parties hereto and their respective successors and permitted assigns. If Sublandlord assigns or transfers the leasehold estate under the Prime Lease, Sublandlord shall be entirely relieved and freed of all obligations under this Sublease.

29. Interpretation. Irrespective of the place of execution of performance, this Sublease shall be governed by and construed in accordance with the laws of California applicable to agreements made and to be wholly performed within such venue. If any provision of this Sublease, or the application thereof to any person or circumstance, shall, for any reason and to any extent, be invalid or unenforceable, then the remainder of this Sublease, and the application of that provision to the other persons or circumstances, shall not be affected but rather shall be enforced to the extent permitted by law. This Sublease shall be construed without regard to any presumption or other rule requiring construction against the party causing this Sublease to be drafted. If any words or phrases in this Sublease shall have been stricken out or otherwise eliminated, it shall be deemed that such words or phrases were never included in this Sublease and no implication or inference shall be drawn from the fact that said words or phrases were so stricken out or otherwise eliminated. Each covenant, agreement, obligation or other provision of this Sublease shall be deemed and construed as a separate and independent covenant of the party undertaking or making same (not dependent on any other provision of this Sublease unless otherwise expressly provided). All terms and words used in this Sublease, regardless of number or gender in which they are used, shall be deemed to include any other number and any other gender as the context may require. The word "person" as used in this Sublease shall mean a natural person or persons, a partnership, a corporation or any other form of business or legal association or entity.

30. No Offer Until Delivery. This Sublease shall not become effective against the Sublandlord until Sublandlord receives: (i) a fully executed counterpart of this Sublease; (ii) the written consent of the Prime Landlord, as required under the Prime Lease; and (iii) the first monthly installment of Rent.

31. Authority. Each party to this Sublease represents that it is authorized to execute and to deliver the same and perform its obligations as set forth herein.

32. Required Accessibility Disclosure. In accordance with Section 1938 of the Civil Code of the State of California, Sublandlord hereby provides the following information:

(a) Sublandlord hereby states that the Subleased Premises have not undergone inspection by a Certified Access Specialist ("CASp").

(b) A CASp can inspect the Subleased Premises and determine whether the Subleased Premises comply with all of the construction-related accessibility standards under state law. Although state law does not require a CASp inspection of the Subleased Premises, the commercial property owner or lessor may not prohibit the lessee or tenant from obtaining a CASp inspection of the subject premises for the occupancy or potential occupancy of the lessee or tenant, if requested by the lessee or tenant. The parties shall mutually agree on the arrangements for the time and manner of the CASp inspection, the payment of the fee for the CASp inspection, and the cost of making repairs necessary to correct violations of construction-related accessibility standards within the premises. In furtherance of the foregoing, Sublandlord and Subtenant hereby agree as follows: (a) any CASp inspection requested by Subtenant shall be conducted, at Subtenant's sole cost and expense, by a CASp designated by Sublandlord, subject to Sublandlord's reasonable rules and requirements; (b) Subtenant, at its sole cost and expense, shall be responsible for making any improvements or repairs within the Subleased Premises to correct violations of construction-related accessibility standards; and (c) if anything done by or for Subtenant in its use or occupancy of the Sublease Premises shall require any improvements or repairs to the Building (outside the Subleased Premises) to correct violations of construction-related accessibility standards, then Subtenant shall reimburse Sublandlord upon demand, as Additional Rent, for the cost to Sublandlord of performing such improvements or repairs or the cost Sublandlord is charged by Prime Landlord to perform the same.

[SIGNATURES ON THE FOLLOWING PAGE]

IN WITNESS WHEREOF, Sublandlord and Subtenant have executed this Sublease as of the date first above written.

Subtenant:

Arrowhead Pharmaceuticals, Inc.,
a Delaware corporation

By: /s/ Kenneth A. Myszkowski
Name: Kenneth A. Myszkowski
Title: Chief Financial Officer

Sublandlord:

Halozyme, Inc.,
a California corporation

By: /s/ Mas Matsuda
Name: Mas Matsuda
Title: Senior Vice President, General Counsel

Exhibit 31.1

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: May 7, 2020

/s/ Christopher Anzalone

Christopher Anzalone
Chief Executive Officer

Exhibit 31.2

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: May 7, 2020

/s/ Kenneth A. Myszkowski

Kenneth A. Myszkowski,
Chief Financial Officer

Exhibit 32.1

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 March 31, 2020, 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: May 7, 2020

/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.

Exhibit 32.2

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 March 31, 2020, 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: May 7, 2020

/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.