ALNYLAM PHARMACEUTICALS, INC.

FORM 10-Q
(Quarterly Report)

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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended June 30, 2017

OR

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

For the transition period from _____ to _____

Commission File Number 001-36407

ALNYLAM PHARMACEUTICALS, INC.

(Exact Name of Registrant as Specified in Its Charter)

Delaware	**77-0602661**
(State or Other Jurisdiction of Incorporation or Organization)	**(I.R.S. Employer Identification No.)**
300 Third Street, Cambridge, MA	**02142**
(Address of Principal Executive Offices)	**(Zip Code)**

(617) 551-8200
(Registrant's Telephone Number, Including Area Code)

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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted 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 and post such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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	☐ (Do not check if a smaller reporting company)	Smaller reporting company	☐
Emerging growth company	☐		

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

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

At July 31, 2017, the registrant had 91,733,369 shares of Common Stock, $0.01 par value per share, outstanding.

INDEX

ALNYLAM PHARMACEUTICALS, INC.
CONDENSED CONSOLIDATED BALANCE SHEETS
(In thousands, except share and per share amounts)
(Unaudited)

	June 30, 2017	December 31, 2016
ASSETS		
Current assets:		
Cash and cash equivalents	$ 408,671	$ 193,617
Marketable securities	514,600	424,185
Investment in equity securities of Regulus Therapeutics Inc.	—	8,997
Billed and unbilled collaboration receivables	15,405	23,334
Prepaid expenses and other current assets	22,033	21,744
Total current assets	960,709	671,877
Marketable securities	174,570	324,799
Property, plant and equipment, net	147,533	114,572
Restricted investments	150,000	150,000
Other assets	1,471	1,562
Total assets	$ 1,434,283	$ 1,262,810
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 23,170	$ 54,465
Accrued expenses	43,820	42,118
Deferred rent	1,942	1,576
Deferred revenue	39,794	33,540
Total current liabilities	108,726	131,699
Deferred rent, net of current portion	7,697	8,431
Deferred revenue, net of current portion	42,079	49,392
Long-term debt	150,000	150,000
Other liabilities	2,815	3,067
Total liabilities	311,317	342,589
Commitments and contingencies (Note 5)		
Stockholders' equity:		
Preferred stock, $0.01 par value per share, 5,000,000 shares authorized and no shares issued and outstanding at June 30, 2017 and December 31, 2016	—	—
Common stock, $0.01 par value per share, 125,000,000 shares authorized; 91,701,397 shares issued and outstanding at June 30, 2017; 85,941,344 shares issued and outstanding at December 31, 2016	917	859
Additional paid-in capital	3,038,529	2,609,614
Accumulated other comprehensive loss	(33,959)	(33,441)
Accumulated deficit	(1,882,521)	(1,656,811)
Total stockholders' equity	1,122,966	920,221
Total liabilities and stockholders' equity	$ 1,434,283	$ 1,262,810

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

ALNYLAM PHARMACEUTICALS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(In thousands, except per share amounts)
(Unaudited)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016
Net revenues from collaborators	$ 15,932	$ 8,709	$ 34,892	$ 16,054
Operating expenses:				
Research and development (1)	90,627	83,172	177,611	179,445
General and administrative (1)	45,779	17,987	84,266	39,087
Total operating expenses	136,406	101,159	261,877	218,532
Loss from operations	(120,474)	(92,450)	(226,985)	(202,478)
Other income (expense):				
Interest income	2,577	2,092	4,705	3,905
Other (expense) income	(523)	229	(3,430)	5,470
Total other income	2,054	2,321	1,275	9,375
Net loss	$ (118,420)	$ (90,129)	$ (225,710)	$ (193,103)
Net loss per common share - basic and diluted	$ (1.34)	$ (1.05)	$ (2.59)	$ (2.26)
Weighted-average common shares used to compute basic and diluted net loss per common share	88,098	85,545	87,068	85,411
Comprehensive loss:				
Net loss	$ (118,420)	$ (90,129)	$ (225,710)	$ (193,103)
Unrealized loss on marketable securities, net of tax	(476)	(18,331)	(2,412)	(26,555)
Reclassification adjustment for realized loss (gain) on marketable securities included in net loss	345	(954)	1,894	(6,110)
Comprehensive loss	$ (118,551)	$ (109,414)	$ (226,228)	$ (225,768)

(1) Stock-based compensation expenses included in operating expenses are as follows:

Research and development	$ 13,254	$ 9,277	$ 21,945	$ 23,633
General and administrative	10,776	6,539	17,802	15,663

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

ALNYLAM PHARMACEUTICALS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)
(Unaudited)

	Six Months Ended June 30,	
	2017	2016
Cash flows from operating activities:		
Net loss	$ (225,710)	$ (193,103)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	6,066	8,612
Stock-based compensation	39,747	39,296
Charge for 401(k) company stock match	1,074	781
Realized loss (gain) on sale of marketable equity securities	1,894	(6,110)
Other	608	—
Changes in operating assets and liabilities:		
Billed and unbilled collaboration receivables	7,929	(1,216)
Prepaid expenses and other assets	(198)	(5,593)
Accounts payable	(8,326)	(3,590)
Accrued expenses and other	(3,404)	1,717
Deferred revenue	(1,059)	5,378
Net cash used in operating activities	(181,379)	(153,828)
Cash flows from investing activities:		
Purchases of property, plant and equipment	(57,803)	(24,380)
Purchases of restricted investments	—	(150,000)
Purchases of marketable securities	(237,184)	(357,992)
Sales and maturities of marketable securities	302,392	605,977
Net cash provided by investing activities	7,405	73,605
Cash flows from financing activities:		
Proceeds from exercise of stock options and other types of equity	12,644	6,266
Proceeds from issuance of common stock, net of offering costs	355,150	—
Proceeds from issuance of common stock to Sanofi Genzyme	21,381	14,301
Proceeds from issuance of long-term debt	—	150,000
Payments for repurchase of common stock for employee tax withholding	(147)	(163)
Net cash provided by financing activities	389,028	170,404
Net increase in cash and cash equivalents	215,054	90,181
Cash and cash equivalents, beginning of period	193,617	180,895
Cash and cash equivalents, end of period	$ 408,671	$ 271,076

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

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation and Principles of Consolidation

The accompanying condensed consolidated financial statements of Alnylam Pharmaceuticals, Inc. are unaudited and have been prepared in accordance with accounting principles generally accepted in the United States of America, or GAAP, applicable to interim periods and, in the opinion of management, include all normal and recurring adjustments that are necessary to present fairly the results of operations for the reported periods. Our condensed consolidated financial statements have also been prepared on a basis substantially consistent with, and should be read in conjunction with, our audited consolidated financial statements for the year ended December 31, 2016, which were included in our Annual Report on Form 10-K that was filed with the Securities and Exchange Commission, or SEC, on February 15, 2017. The year-end condensed consolidated balance sheet data was derived from our audited financial statements, but does not include all disclosures required by GAAP. The results of our operations for any interim period are not necessarily indicative of the results of our operations for any other interim period or for a full fiscal year.

The accompanying condensed consolidated financial statements reflect the operations of Alnylam and our wholly-owned subsidiaries. All intercompany accounts and transactions have been eliminated.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the condensed consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Liquidity

Based on our current operating plan, we believe that our cash, cash equivalents and fixed income marketable securities at June 30, 2017, together with the cash we expect to generate under our current alliances, will be sufficient to enable us to advance our *Alnylam 2020* strategy for at least the next 12 months from the filing of this Quarterly Report on Form 10-Q.

Net Loss Per Common Share

We compute basic net loss per common share by dividing net loss by the weighted-average number of common shares outstanding. We compute diluted net loss per common share by dividing net loss by the weighted-average number of common shares and dilutive potential common share equivalents then outstanding. Potential common shares consist of shares issuable upon the exercise of stock options (the proceeds of which are then assumed to have been repurchased using the treasury stock method). Because the inclusion of potential common shares would be anti-dilutive for all periods presented, diluted net loss per common share is the same as basic net loss per common share.

The following table sets forth for the periods presented the potential common shares (prior to consideration of the treasury stock method) excluded from the calculation of net loss per common share because their inclusion would be anti-dilutive, in thousands:

	At June 30,	
	2017	2016
Options to purchase common stock	12,372	10,377
Unvested restricted common stock	172	179
	12,544	10,556

Public Offering

In May 2017, we sold an aggregate of 5,000,000 shares of our common stock through an underwritten public offering at a price to the public of $71.87 per share. As a result of the offering, we received aggregate net proceeds of $355.2 million after deducting underwriting discounts and commissions and other offering expenses of $4.2 million.

Equity

Total stockholders' equity at June 30, 2017 increased by $202.7 million compared to December 31, 2016. This increase was related primarily to increases to additional paid-in capital due to our public offering in May 2017, our issuance of common stock to

Sanofi Genzyme in May 2017 and stock-based compensation, partially offset during the six months ended June 30, 2017 by our net loss.

Fair Value Measurements

The fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. In general, fair values determined by Level 1 inputs utilize quoted prices (unadjusted) in active markets for identical assets or liabilities. Fair values determined by Level 2 inputs utilize data points that are observable, such as quoted prices (adjusted), interest rates and yield curves. Fair values determined by Level 3 inputs utilize unobservable data points for the asset or liability, and include situations where there is little, if any, market activity for the asset or liability. The fair value hierarchy level is determined by the lowest level of significant input.

Investments in Marketable Securities and Cash Equivalents

We invest our excess cash balances in short-term and long-term marketable debt and equity securities. We classify our investments in marketable debt securities as either held-to-maturity or available-for-sale based on facts and circumstances present at the time we purchased the securities. At each balance sheet date presented, we classified all of our investments in debt and equity securities as available-for-sale. We report available-for-sale investments at fair value at each balance sheet date and include any unrealized holding gains and losses (the adjustment to fair value) in accumulated other comprehensive income (loss), a component of stockholders' equity. At June 30, 2017, the balance in our accumulated other comprehensive loss was composed solely of activity related to our available-for-sale marketable securities, including our investment in equity securities of Regulus Therapeutics Inc., or Regulus. Realized gains and losses are determined using the specific identification method and are included in other income (expense). We recognized $0.3 million of realized losses and $1.0 million of realized gains from sales of our Regulus available-for-sale securities as other income (expense) in our condensed consolidated statements of comprehensive loss during the three months ended June 30, 2017 and 2016, respectively. In addition, we recognized $1.9 million of realized losses and $6.1 million of realized gains from sales of our Regulus available-for-sale securities as other income (expense) in our condensed consolidated statements of comprehensive loss during the six months ended June 30, 2017 and 2016, respectively. If any adjustment to arrive at fair value reflects a decline in the value of the investment, we consider all available evidence to evaluate the extent to which the decline is "other than temporary," including our intention to sell and, if so, record a charge to our condensed consolidated statements of comprehensive loss. We did not record any impairment charges related to our fixed income marketable securities during the six months ended June 30, 2017 or 2016. Our marketable securities are classified as cash equivalents if the original maturity, from the date of purchase, is 90 days or less, and as marketable securities if the original maturity, from the date of purchase, is in excess of 90 days. Our cash equivalents are composed of commercial paper, money market funds, and U.S. government-sponsored enterprise securities .

During the second quarter of 2017, we sold all our remaining holdings in Regulus. We accounted for our investment in Regulus as an available-for-sale marketable security. Intraperiod tax allocation rules require us to allocate our provision for income taxes between continuing operations and other categories of earnings, such as other comprehensive income. In periods in which we have a year-to-date pre-tax loss from continuing operations and pre-tax income in other categories of earnings, such as other comprehensive income, we must allocate the tax provision to the other categories of earnings. We then record a related tax benefit in continuing operations. Upon sales of our available-for-sale marketable securities, we apply the aggregate portfolio approach to recognize the related tax provision or benefit into income (loss) from continuing operations. As a result, the disproportionate tax effect remains in accumulated other comprehensive income (loss) as long as we maintain an investment portfolio.

Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board, or FASB, issued a new revenue recognition standard which amends revenue recognition principles and provides a single, comprehensive set of criteria for revenue recognition within and across all industries. The new standard provides a five step framework whereby revenue is recognized when promised goods or services are transferred to a customer at an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The standard also requires enhanced disclosures pertaining to revenue recognition in both interim and annual periods. In August 2015, the FASB deferred the effective date of the new revenue standard from January 1, 2017 to January 1, 2018. In March 2016, the FASB issued amendments to clarify the implementation guidance on principal versus agent considerations. In April 2016, the FASB issued amendments to clarify the guidance on accounting for licenses of intellectual property and identifying performance obligations. In May 2016, the FASB issued amendments related to collectibility, non-cash consideration, the presentation of sales and other similar taxes collected from customers and transition. The standard allows for adoption using a full retrospective method or a modified retrospective method. We plan to adopt this standard using the modified retrospective method. During the second half of 2017, we plan to complete our review of our revenue streams to determine the impact that this standard could have on our condensed consolidated financial statements and related disclosures.

In January 2016, the FASB issued new guidance on recognition and measurement of financial assets and financial liabilities. The new guidance will impact the accounting for equity investments, financial liabilities under the fair value option, and the presentation and disclosure requirements for financial instruments. All equity investments in unconsolidated entities (other than those

accounted for under the equity method of accounting) will generally be measured at fair valu e with changes in fair value recognized through earnings. There will no longer be an available-for-sale classification (changes in fair value reported in other comprehensive income (loss)) for equity securities with readily determinable fair values. In add ition, the FASB clarified the need for a valuation allowance on deferred tax assets resulting from unrealized losses on available-for-sale debt securities. In general, the new guidance will require modified retrospective application to all outstanding inst ruments, with a cumulative effect adjustment recorded to opening retained earnings. This guidance will be effective for us on January 1, 2018. We are currently evaluating the expected impact that the standard could have on our condensed consolidated financ ial statements and related disclosures.

In February 2016, the FASB issued a new leasing standard that requires that all lessees recognize the assets and liabilities that arise from leases on the condensed consolidated balance sheet and disclose qualitative and quantitative information about its leasing arrangements. The new standard will be effective for us on January 1, 2019. Early adoption is permitted. We are currently evaluating the timing of our adoption and the expected impact that this standard could have on our condensed consolidated financial statements and related disclosures.

In October 2016, the FASB issued guidance that an entity should recognize the income tax consequences of an intra-entity transfer of an asset other than inventory when the transfer occurs instead of deferring the income tax effects. The new standard will be effective for us on a modified retrospective basis on January 1, 2018. We are currently evaluating the expected impact that this standard could have on our condensed consolidated financial statements and related disclosures.

In November 2016, the FASB issued guidance that requires restricted cash and restricted cash equivalents be included with cash and cash equivalents when reconciling the total beginning and ending amounts for the periods shown on the statement of cash flows. The new standard will be effective for us on January 1, 2018 using a retrospective transition method to each period presented. Early adoption is permitted. We are currently evaluating the timing of our adoption and the expected impact that this standard could have on our condensed consolidated financial statements and related disclosures.

In March 2017, the FASB issued guidance that amends the amortization period for certain purchased callable debt securities held at a premium by shortening the amortization period for the premium to the earliest call date. The new standard will be effective for us on January 1, 2019. Early adoption is permitted. We are currently evaluating the timing of our adoption and the expected impact that this standard could have on our condensed consolidated financial statements and related disclosures.

In May 2017, the FASB issued guidance that clarifies when changes to the terms or conditions of share-based payment awards must be accounted for as modifications. The new standard will be applied prospectively to awards modified on or after the adoption date and will be effective for us on January 1, 2018. Early adoption is permitted. The adoption of this standard is not expected to have a material impact on our condensed consolidated financial statements and related disclosures.

Subsequent Event

We did not have any material recognized subsequent events. However, we did have the following nonrecognized subsequent event, which is more fully described in Note 5.

- On August 8, 2017, Dicerna Pharmaceuticals, Inc., or Dicerna, filed a new complaint in the United States District Court for the District of Massachusetts asserting a claim for attempted monopolization under the Sherman Antitrust Act.

2. COLLABORATION AGREEMENTS

The following table summarizes our total consolidated net revenues from collaborators, for the periods indicated, in thousands:

	Three Months Ended June 30,		Six Months Ended June 30,	
Description	**2017**	**2016**	**2017**	**2016**
Sanofi Genzyme	$ 14,375	$ 5,387	$ 26,652	$ 9,802
The Medicines Company	1,522	3,268	7,886	5,925
Other	35	54	354	327
Total net revenues from collaborators	$ 15,932	$ 8,709	$ 34,892	$ 16,054

Product Alliances

Sanofi Genzyme Collaboration

In January 2014, we entered into a global, strategic collaboration with Sanofi Genzyme, the specialty care global business unit of Sanofi, to discover, develop and commercialize RNA interference, or RNAi, therapeutics as Genetic Medicines to treat orphan diseases. The 2014 Sanofi Genzyme collaboration superseded and replaced the previous collaboration between us and Sanofi Genzyme entered into in October 2012 to develop and commercialize RNAi therapeutics targeting transthyretin, or TTR, for the treatment of hereditary ATTR amyloidosis, including patisiran and revusiran, in Japan and the Asia-Pacific region.

2012 Sanofi Genzyme Agreement

Under the 2012 Sanofi Genzyme agreement, Sanofi Genzyme paid us an upfront cash payment of $22.5 million. We were also entitled to receive certain milestone payments under the 2012 Sanofi Genzyme agreement. In the fourth quarter of 2013, we earned a milestone of $7.0 million based upon the completion of a successful patisiran Phase 2 clinical trial and a milestone of $4.0 million based upon the initiation of the APOLLO Phase 3 clinical trial for patisiran.

We determined that the deliverables under the 2012 Sanofi Genzyme agreement included the license, a joint steering committee and any additional TTR-specific RNAi therapeutic compounds that comprised the ALN-TTR program. We also determined that, pursuant to the accounting guidance governing revenue recognition on multiple element arrangements, the license and undelivered joint steering committee and any additional TTR-specific RNAi therapeutic compounds did not have standalone value due to the specialized nature of the services to be provided by us. In addition, while Sanofi Genzyme had the ability to grant sublicenses, it could not sublicense all or substantially all of its rights under the 2012 Sanofi Genzyme agreement. The uniqueness of our services and the limited sublicense right were indicators that standalone value was not present in the arrangement. Therefore the deliverables were not separable and, accordingly, the license and undelivered services were treated as a single unit of accounting. We were unable to reasonably estimate the period of performance under the 2012 Sanofi Genzyme agreement, as we were unable to estimate the timeline of our deliverables related to the deliverable for any additional TTR-specific RNAi therapeutic compounds. Through December 31, 2013, we had deferred all revenue, or $33.5 million, under the 2012 Sanofi Genzyme agreement.

2014 Sanofi Genzyme Collaboration

In January 2014, we entered into the 2014 Sanofi Genzyme collaboration. As noted above, the 2014 Sanofi Genzyme collaboration superseded and replaced the 2012 Sanofi Genzyme agreement.

The 2014 Sanofi Genzyme collaboration is structured as an exclusive relationship for the worldwide development and commercialization of RNAi therapeutics in the field of Genetic Medicines, which includes our current and future Genetic Medicine programs that reach Human Proof-of-Principle Study Completion (as defined in the Sanofi Genzyme master agreement), or Human POP, by the end of 2019, subject to extension to the end of 2021 in various circumstances. We will retain product rights in the United States, Canada and Western Europe, referred to as the Alnylam Territory, while Sanofi Genzyme will obtain exclusive rights to develop and commercialize collaboration products in the rest of the world, referred to as the Sanofi Genzyme Territory, together with certain broader co-development/co-commercialize or worldwide rights for certain products. Sanofi Genzyme's rights, described in detail below, are structured as an opt-in that is triggered upon achievement of Human POP. We maintain development control for all programs prior to Sanofi Genzyme's opt-in and maintain development and commercialization control after Sanofi Genzyme's opt-in for all programs in the Alnylam Territory. We will retain global rights to any RNAi therapeutic Genetic Medicine program that does not reach Human POP by the end of 2019, subject to certain limited exceptions. We retain full rights to all current and future RNAi therapeutic programs outside of the field of Genetic Medicines, including the right to form new collaborations.

Under the 2014 Sanofi Genzyme collaboration, Sanofi Genzyme's specific license rights and the programs into which Sanofi Genzyme has opted include the following:

- Regional license terms and programs — Upon opt-in, we will retain product rights in the Alnylam Territory, while Sanofi Genzyme will obtain exclusive rights to develop and commercialize the product in the Sanofi Genzyme Territory. Sanofi Genzyme can elect this license for any of our current and future Genetic Medicine programs that complete Human POP by the end of 2019, subject to limited extension. Development costs for products once Sanofi Genzyme exercises an option will be shared between Sanofi Genzyme and us, with Sanofi Genzyme responsible for twenty percent of the global development costs. Upon the effective date of the 2014 Sanofi Genzyme collaboration, Sanofi Genzyme expanded the scope of its regional license and collaboration for patisiran, an investigational RNAi therapeutic currently in Phase 3 clinical development, which was originally established under the 2012 Sanofi Genzyme agreement. In September 2015, Sanofi Genzyme elected to opt into our fitusiran clinical development program for the treatment of hemophilia and other rare bleeding disorders under the regional license terms. Cost-sharing for the fitusiran program began in January 2016 under the regional license terms. Sanofi Genzyme also had the right to elect to co-develop and co-commercialize fitusiran in the Alnylam Territory pursuant to the co-development/co-commercialize license terms described below. In November 2016, Sanofi Genzyme exercised this right and elected to co-develop and co-commercialize fitusiran in the Alnylam

Territory . In addition, during 2016, Sanofi Genzyme elected not to opt into the development and commercialization of givosiran or ALN-CC5 in the Sanofi Genzyme Territory . Sanofi Genzyme will be req uired to make payments totaling up to $50.0 million upon the achievement of certain patisiran development milestones. We could potentially earn the next patisiran milestone payment, ranging between $5.0 million and $20.0 million based on the geographic reg ion, upon the achievement of specified events in connection with a regulatory filing or approval. In addition, Sanofi Genzyme will be required to make payments totaling up to $75.0 million per regional product other than patisiran, consisting of up to $55. 0 million in development milestones and $20.0 million in commercial milestones. Sanofi Genzyme will also be required to pay tiered double-digit royalties up to twenty percent for each regional product based on annual net sales, if any, of such regional pro duct by Sanofi Genzyme, its affiliates and sublicensees.

- Co-development/co-commercialize license terms and programs — Upon opt-in, we will retain product rights in the Alnylam Territory, while Sanofi Genzyme will obtain exclusive rights to develop and commercialize the product in the Sanofi Genzyme Territory, and will co-commercialize the product in the Alnylam Territory. Upon the effective date of the 2014 Sanofi Genzyme collaboration, Sanofi Genzyme expanded its regional rights for revusiran, an investigational RNAi therapeutic that was previously being advanced in a Phase 3 clinical trial, which were originally granted under the 2012 Sanofi Genzyme agreement, to include a co-development/co-commercialize license and collaboration. In October 2016, upon the recommendation of the revusiran ENDEAVOUR Phase 3 study Data Monitoring Committee to suspend dosing, we decided to discontinue development of revusiran. As noted above, in November 2016, Sanofi Genzyme exercised its right to elect a co-development/co-commercialize license for fitusiran. Development costs for co-development/co-commercialize products, once Sanofi Genzyme exercises an option, will be shared between Sanofi Genzyme and us, with Sanofi Genzyme responsible for fifty percent of the global development costs. In connection with the exercise of its co-development/co-commercialize rights for fitusiran, Sanofi Genzyme paid us approximately $6.0 million in January 2017 for its incremental share of co-development costs incurred from January 2016 through September 2016. Sanofi Genzyme will be required to make payments totaling up to $75.0 million in development milestones for fitusiran, and, prior to the discontinuation of the revusiran program, was required to make certain milestone payments for revusiran. In December 2014, we earned a development milestone payment of $25.0 million based upon the initiation of the first global Phase 3 clinical trial for revusiran. We expect to earn the first fitusiran milestone payment of $25.0 million upon the dosing of the first patient in our ATLAS Phase 3 program for fitusiran. We announced the initiation of the ATLAS Phase 3 program in July 2017. Sanofi Genzyme will also be required to pay tiered double-digit royalties up to twenty percent for each co-development/co-commercialize product based on annual net sales, if any, in the Sanofi Genzyme Territory for such co-development/co-commercialize product by Sanofi Genzyme, its affiliates and sublicensees. The parties will share profits equally and we expect to book product sales in the Alnylam Territory.
- Global license terms and programs — Upon opt-in, Sanofi Genzyme will obtain a worldwide license to develop and commercialize the product. Sanofi Genzyme had the right to elect a global license for givosiran, but instead elected a license to co-develop and co-commercialize fitusiran, as described above. Sanofi Genzyme continues to have one right to a global license through 2019, subject to limited extension, for a future Genetic Medicine program that was not one of our defined Genetic Medicine programs as of the effective date of the 2014 Sanofi Genzyme collaboration. Sanofi Genzyme shall be responsible for one hundred percent of global development costs. Sanofi Genzyme will be required to make payments totaling up to $200.0 million for such global product, including up to $100.0 million in development milestones and $100.0 million in commercial milestones. Sanofi Genzyme will also be required to pay tiered double-digit royalties up to twenty percent for such global product based on annual net sales, if any, of such global product by Sanofi Genzyme, its affiliates and sublicensees.

Due to the uncertainty of pharmaceutical development and the high historical failure rates generally associated with drug development, we may not receive any additional milestone payments or any royalty payments from Sanofi Genzyme under the 2014 Sanofi Genzyme collaboration.

Under the master agreement, the parties will collaborate in the development of option products, with us leading development for all programs prior to Sanofi Genzyme's opt-in and also leading development and commercialization for all programs in the Alnylam Territory after Sanofi Genzyme's opt-in. If Sanofi Genzyme does not exercise its option to license rights to a particular program, we will retain the exclusive right to develop and commercialize such program throughout the world, including the right to sublicense to third parties.

The 2014 Sanofi Genzyme collaboration is governed by an alliance joint steering committee that is comprised of an equal number of representatives from each party. There are additional committees to manage various aspects of each regional, co-developed/co-commercialized and global program. We and Sanofi Genzyme intend to enter into supply agreements to provide for supply of collaboration products to Sanofi Genzyme for clinical studies, and, at Sanofi Genzyme's request, commercial sales. Sanofi Genzyme also has certain rights to manufacture collaboration products. Additionally, Sanofi Genzyme has certain limited opt-out rights, as specified in the master agreement, upon which products revert fully back to us with no further obligations to Sanofi Genzyme.

Upon the closing of the equity transaction in February 2014, we sold to Sanofi Genzyme 8,766,338 shares of our common stock and Sanofi Genzyme paid $700.0 million in aggregate cash consideration to us. As a condition to the closing of the equity transaction,

Sanofi Genzyme entered into an investor agreement with us containing provisions regarding Sanofi Genzyme's holding and "standstill" obligations, additional purchase, voting and registration rights, as well as certain other rights and obligations of th e parties.

We recorded the issuance of 8,766,338 shares of our common stock under the stock purchase agreement using the price of our common stock on the date the shares were issued to Sanofi Genzyme. Based on the common stock price of $85.72, the fair value of the shares issued was $751.5 million, which was $51.5 million in excess of the proceeds received from Sanofi Genzyme for the issuance of our common stock. This $51.5 million is being amortized on a straight-line basis over the performance period. In addition, due to intraperiod tax allocation rules, upon closing of the equity transaction we recorded a benefit from income taxes of $15.2 million due to the Sanofi Genzyme equity purchase being recorded in additional paid-in capital, net of tax.

In accordance with the investor agreement, as a result of our issuance of shares in connection with our acquisition of Sirna Therapeutics, Inc., or Sirna, in March 2014, Sanofi Genzyme exercised its right to purchase an additional 344,448 shares of our common stock for $23.0 million. In addition, in connection with our public offerings, Sanofi Genzyme exercised its right to purchase directly from us, in concurrent private placements, 744,566 shares of common stock in January 2015 at the public offering price resulting in $70.7 million in proceeds to us and 297,501 shares of common stock in May 2017 at the public offering price resulting in $21.4 million in proceeds to us. The sales of common stock to Sanofi Genzyme were not registered as part of these public offerings, though they were consummated simultaneously with such public offerings.

Sanofi Genzyme also has the right at the beginning of each year to purchase a number of shares of our common stock based on the number of shares we issued during the previous year for compensation-related purposes. Sanofi Genzyme exercised this right to purchase directly from us 196,251 shares of our common stock on January 22, 2015 for $18.3 million and 205,030 shares of our common stock on February 1, 2016 for $14.3 million. In January 2017, Sanofi Genzyme elected not to exercise its compensation-related right for 2016. The sales of these shares to Sanofi Genzyme were consummated as private placements.

In each instance, the purchase by Sanofi Genzyme described above allowed Sanofi Genzyme to maintain its ownership level of our common stock of approximately 12 percent.

We determined that the deliverables for the programs on which Sanofi Genzyme was collaborating with us upon initiation of the 2014 Sanofi Genzyme collaboration included the licenses to our patisiran and revusiran clinical programs, which licenses were delivered to Sanofi Genzyme upon the closing date of the transaction, and the associated development activities, joint steering committee participation and information exchange for these clinical programs. We also determined that, pursuant to the accounting guidance governing revenue recognition on multiple element arrangements, the license and associated undelivered development activities, joint steering committee participation and information exchange activities did not have standalone value due to the specialized nature of the services to be provided by us. In addition, while Sanofi Genzyme has the ability to grant sublicenses, it cannot sublicense all or substantially all of its rights under the 2014 Sanofi Genzyme collaboration. The uniqueness of our services and the limited sublicense rights are indicators that standalone value is not present in the arrangement. Therefore the deliverables are not separable and, accordingly, the license and undelivered services were treated as a single unit of accounting. When multiple deliverables are accounted for as a single unit of accounting, we base our revenue recognition model on the final deliverable. Under the 2014 Sanofi Genzyme collaboration, the last deliverables for patisiran and revusiran were expected to be completed within approximately six years from the closing date of the transaction and the last deliverables for fitusiran are expected to be completed within approximately five years from the date Sanofi Genzyme elected to opt into our fitusiran clinical development program under the regional license terms. Our estimate regarding the performance period under the 2014 Sanofi Genzyme collaboration related to the license to our patisiran and revusiran clinical programs was adjusted in October 2016 due to our decision to discontinue development of revusiran. As a result, with respect to these programs, we currently expect the last deliverables to be completed within approximately five years from the closing date of the transaction.

We determined that the total cash received from Sanofi Genzyme under the now superseded 2012 Sanofi Genzyme agreement reflects consideration for certain of the performance obligations for ALN-TTR programs included in the 2014 Sanofi Genzyme collaboration. Therefore we are recognizing the $33.5 million of deferred revenue under the 2012 Sanofi Genzyme agreement on a straight-line basis over the period of performance of the ALN-TTR programs. As consideration is achieved, including any milestones or reimbursement for development activities, we recognize as revenue a portion of these payments equal to the percentage of the performance period completed when the milestone or activities have been satisfied, multiplied by the amount of the payment. We recognize the remaining portion of consideration received over the remaining performance period on a straight-line basis.

The following table presents information related to the 2014 Sanofi Genzyme collaboratio n, in thousands:

Excess of fair value of our common stock issued to Sanofi Genzyme in February 2014	$	(51,450)
Deferred revenue remaining under the 2012 Sanofi Genzyme agreement upon execution of the 2014 Sanofi Genzyme collaboration		33,500
Milestone payment received:		
Year-ended December 31, 2014		25,000
Expense reimbursement from Sanofi Genzyme:		
Year-ended December 31, 2015		33,949
Year-ended December 31, 2016		54,337
Quarter-ended March 31, 2017		13,012
Quarter-ended June 30, 2017		15,037
Total consideration at June 30, 2017	$	123,385
Cumulative revenue recognized at June 30, 2017	$	70,041
Deferred revenue at June 30, 2017	$	53,344

We determined that the opt-in rights that Sanofi Genzyme has for future Genetic Medicine programs represent separate and additional deliverables that Sanofi Genzyme may receive from us in future periods. Upon each initial opt-in by Sanofi Genzyme, we have determined that each program and the related activities will represent a single unit of accounting and, consistent with our accounting policies, we will base our revenue recognition period on the final deliverable associated with each future opt-in.

3. FAIR VALUE MEASUREMENTS

The following tables present information about our assets that are measured at fair value on a recurring basis at June 30, 2017 and December 31, 2016, and indicate the fair value hierarchy of the valuation techniques we utilized to determine such fair value, in thousands:

Description	At June 30, 2017	Quoted Prices in Active Markets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Cash equivalents:				
Commercial paper	$ 3,990	$ —	$ 3,990	$ —
U.S. government-sponsored enterprise securities	7,987	—	7,987	—
Money market funds	373,415	373,415	—	—
Marketable securities (fixed income):				
Certificates of deposit	12,900	—	12,900	—
Commercial paper	62,758	—	62,758	—
Corporate notes	269,009	—	269,009	—
U.S. government-sponsored enterprise securities	304,518	—	304,518	—
U.S. treasury securities	39,985	—	39,985	—
Restricted cash (money market funds)	1,471	1,471	—	—
Total	$ 1,076,033	$ 374,886	$ 701,147	$ —

Description	At December 31, 2016	Quoted Prices in Active Markets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Cash equivalents:				
Commercial paper	$ 17,199	$ —	$ 17,199	$ —
Money market funds	151,479	151,479	—	—
Marketable securities (fixed income):				
Certificates of deposit	17,999	—	17,999	—
Commercial paper	59,340	—	59,340	—
Corporate notes	333,872	—	333,872	—
U.S. government-sponsored enterprise securities	297,773	—	297,773	—
U.S. treasury securities	40,000	—	40,000	—
Marketable securities (Regulus equity holdings)	8,997	8,997	—	—
Restricted cash (money market funds)	1,471	1,471	—	—
Total	$ 928,130	$ 161,947	$ 766,183	$ —

During the six months ended June 30, 2017, there were no transfers between Level 1 and Level 2 financial assets. The carrying amounts reflected in our condensed consolidated balance sheets for cash, billed and unbilled collaboration receivables, other current assets, accounts payable and accrued expenses approximate fair value due to their short-term maturities. The fair value of our long-term debt at June 30, 2017 , computed pursuant to a discounted cash flow technique using a market interest rate, was $150.2 million and is considered a Level 3 fair value measurement. The effective interest rate reflects the current market rate.

4. MARKETABLE SECURITIES

The following tables summarize the fair value, accumulated other comprehensive income (loss) and intraperiod tax allocation regarding our investment in Regulus available-for-sale marketable securities at June 30, 2017 and 2016, and for the activity recorded for the three months ended June 30, 2017 and 2016, in thousands:

Description	At March 31, 2017	Sales of Regulus Shares During Three Months Ended June 30, 2017	All Other Activity During Three Months Ended June 30, 2017	Balance at June 30, 2017
Carrying value	$ 2,682	$ (2,682)	$ —	$ —
Accumulated other comprehensive income (loss), before tax	—	345	(345)	—
Investment in equity securities of Regulus, as reported	$ 2,682	$ (2,337)	$ (345)	$ —
Accumulated other comprehensive income (loss), before tax	$ —	$ 345	$ (345)	$ —
Intraperiod tax allocation recorded as a benefit from income taxes	(32,792)	—	—	(32,792)
Accumulated other comprehensive income (loss), net of tax	$ (32,792)	$ 345	$ (345)	$ (32,792)

Description	At March 31, 2016	Sales of Regulus Shares During Three Months Ended June 30, 2016	All Other Activity During Three Months Ended June 30, 2016	Balance at June 30, 2016
Carrying value	$ 9,911	$ (574)	$ —	$ 9,337
Accumulated other comprehensive income (loss), before tax	24,023	(954)	(19,074)	3,995
Investment in equity securities of Regulus, as reported	$ 33,934	$ (1,528)	$ (19,074)	$ 13,332
Accumulated other comprehensive income (loss), before tax	$ 24,023	$ (954)	$ (19,074)	$ 3,995
Intraperiod tax allocation recorded as a benefit from income taxes	(32,792)	—	—	(32,792)
Accumulated other comprehensive income (loss), net of tax	$ (8,769)	$ (954)	$ (19,074)	$ (28,797)

The following tables summarize the fair value, accumulated other comprehensive income (loss) and intraperiod tax allocation regarding our investment in Regulus available-for-sale marketable securities at June 30, 2017 and 2016, and for the activity recorded for the six months ended June 30, 2017 and 2016, in thousands:

Description	At December 31, 2016	Sales of Regulus Shares During Six Months Ended June 30, 2017	All Other Activity During Six Months Ended June 30, 2017	Balance at June 30, 2017
Carrying value	$ 8,093	$ (7,485)	$ (608)	$ —
Accumulated other comprehensive income (loss), before tax	904	1,894	(2,798)	—
Investment in equity securities of Regulus, as reported	$ 8,997	$ (5,591)	$ (3,406)	$ —
Accumulated other comprehensive income (loss), before tax	$ 904	$ 1,894	$ (2,798)	$ —
Intraperiod tax allocation recorded as a benefit from income taxes	(32,792)	—	—	(32,792)
Accumulated other comprehensive income (loss), net of tax	$ (31,888)	$ 1,894	$ (2,798)	$ (32,792)

Description	At December 31, 2015	Sales of Regulus Shares During Six Months Ended June 30, 2016	All Other Activity During Six Months Ended June 30, 2016	Balance at June 30, 2016
Carrying value	$ 11,935	$ (2,598)	$ —	$ 9,337
Accumulated other comprehensive income (loss), before tax	39,484	(6,110)	(29,379)	3,995
Investment in equity securities of Regulus, as reported	$ 51,419	$ (8,708)	$ (29,379)	$ 13,332
Accumulated other comprehensive income (loss), before tax	$ 39,484	$ (6,110)	$ (29,379)	$ 3,995
Intraperiod tax allocation recorded as a benefit from income taxes	(32,792)	—	—	(32,792)
Accumulated other comprehensive income (loss), net of tax	$ 6,692	$ (6,110)	$ (29,379)	$ (28,797)

We obtain fair value measurement data for our marketable securities from independent pricing services. We perform validation procedures to ensure the reasonableness of this data. This includes meeting with the independent pricing services to understand the methods and data sources used. Additionally, we perform our own review of prices received from the independent pricing services by comparing these prices to other sources and confirming those securities are trading in active markets.

The following tables summarize our marketable securities, other than our holdings in Regulus noted above, at June 30, 2017 and December 31, 2016, in thousands:

	At June 30, 2017			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Certificates of deposit	$ 12,900	$ —	$ —	$ 12,900
Commercial paper	62,761	—	(3)	62,758
Corporate notes	269,265	30	(286)	269,009
U.S. government-sponsored enterprise securities	305,400	1	(883)	304,518
U.S. treasury securities	40,011	—	(26)	39,985
Total	$ 690,337	$ 31	$ (1,198)	$ 689,170

	At December 31, 2016			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Certificates of deposit	$ 17,999	$ —	$ —	$ 17,999
Commercial paper	59,340	—	—	59,340
Corporate notes	334,266	47	(441)	333,872
U.S. government-sponsored enterprise securities	298,910	9	(1,146)	297,773
U.S. treasury securities	40,022	1	(23)	40,000
Total	$ 750,537	$ 57	$ (1,610)	$ 748,984

We classify our debt security investments based on their contractual maturity dates. The following table summarizes our available-for-sale debt securities by contractual maturity, at June 30, 2017, in thousands:

	At June 30, 2017	
	Amortized Cost	Fair Value
Less than one year	$ 515,123	$ 514,600
Greater than one year but less than two years	175,214	174,570
Total	$ 690,337	$ 689,170

5. COMMITMENTS AND CONTINGENCIES

Manufacturing Facility

In February 2016, we entered into an agreement with 20 Commerce LLC to purchase 12 acres of undeveloped land in Norton, Massachusetts. We completed the purchase and closed this transaction on April 4, 2016. We are constructing a manufacturing facility at this site for drug substance, including small interfering RNAs, or siRNAs, and siRNA conjugates, for clinical and commercial use. At June 30, 2017 and December 31, 2016, property, plant and equipment, net, on our condensed consolidated balance sheets reflects $105.3 million and $73.2 million, respectively, of land and associated costs related to the construction of our drug substance manufacturing facility.

Credit Agreements

On April 29, 2016, we entered into term loan agreements with two lenders for an aggregate of $150.0 million, with Alnylam U.S., Inc., our wholly-owned subsidiary, as the borrower, and us, as a guarantor, which mature on April 29, 2021, referred to as the Credit Agreements. The Credit Agreements were entered into in connection with the planned build out of our new drug substance manufacturing facility.

The proceeds of the borrowing under each of the Credit Agreements are to be used for working capital and general corporate purposes. Interest on borrowings under the Credit Agreements is calculated based on LIBOR plus 0.45 percent, except in the event of default. The borrower may prepay loans under each of the Credit Agreements at any time, without premium or penalty, subject to certain notice requirements and LIBOR breakage costs.

The obligations of the borrower under each Credit Agreement are guaranteed by us. The obligations of the borrower and us under each Credit Agreement are secured by cash collateral in an amount equal to, at any given time, at least 100 percent of the principal amount of all term loans outstanding under such Credit Agreement at such time. At each of June 30, 2017 and December 31,

2016, we have recorded $150.0 million of cash collateral in connection with the Credit Agreements as restricted investments on our condensed c onsolidated balance sheets.

Each Credit Agreement contains limited representations and warranties and limited affirmative and negative covenants, including quarterly reporting obligations, as well as certain customary events of default.

During the three and six months ended June 30, 2017, we recorded $0.4 million and $0.8 million, respectively, of interest expense related to the Credit Agreements that is reflected in other income (expense) on our condensed consolidated statements of comprehensive loss. During the three and six months ended June 30, 2016, we recorded $0.7 million of interest expense related to the Credit Agreements that is reflected in other income (expense) on our condensed consolidated statements of comprehensive loss.

Litigation

From time to time, we are a party to legal proceedings in the course of our business, including the matter described below. The claims and legal proceedings in which we could be involved include challenges to the scope, validity or enforceability of patents relating to our product candidates, and challenges by us to the scope, validity or enforceability of the patents held by others. These include claims by third parties that we infringe their patents. The outcome of any such legal proceedings, regardless of the merits, is inherently uncertain. In addition, litigation and related matters are costly and may divert the attention of our management and other resources that would otherwise be engaged in other activities. If we were unable to prevail in any such legal proceedings, our business, results of operations, liquidity and financial condition could be adversely affected . Our accounting policy for accrual of legal costs is to recognize such expenses as incurred.

Dicerna Litigation

On June 10, 2015, we filed a trade secret misappropriation lawsuit against Dicerna, in the Superior Court of Middlesex County, Massachusetts, seeking to stop misappropriation by Dicerna of our confidential, proprietary and trade secret information related to the RNAi assets we purchased from Merck, including certain N-acetylgalactosamine, or GalNAc, conjugate technology. In addition to permanent injunctive relief, we are also seeking monetary damages from Dicerna. On July 10, 2015, Dicerna filed its answer to our complaint, in which it denied our claims, along with initial discovery requests, to which we responded in a timely fashion. On July 27, 2015, Dicerna filed a motion seeking removal of the case to the Business Litigation Session of the Superior Court of Suffolk County, which we opposed. On August 31, 2015, the Court denied Dicerna's motion. We and Dicerna agreed to a protective order, which was entered by the Court on November 12, 2015. On June 7, 2017, Dicerna filed a motion requesting leave of the Court to amend its answer to our complaint to add counterclaims alleging abuse of process, tortious interference and unfair trade practices and seeking unspecified damages. We opposed the motion and do not believe the claims alleged by Dicerna are meritorious. Following a hearing on August 1, 2017, the Court granted Dicerna's motion to amend its answer to add its counterclaims. To the extent such claims are not dismissed or struck, we intend to vigorously defend against such claims. Fact discovery on our claims against Dicerna is expected to close in August 2017, while fact discovery on issues related to Dicerna's counterclaims will continue until December 2017. The trial for this lawsuit now is scheduled for April 2018. In addition, on August 8, 2017, Dicerna filed a new complaint in the United States District Court for the District of Massachusetts asserting a claim for attempted monopolization under the Sherman Antitrust Act. Dicerna's allegations related to its new claim largely overlap with its counterclaims in the state court action. The new complaint has not yet been served and no schedule has been set. We do not believe the claim is meritorious and intend to vigorously defend against the claim.

Although we believe we have meritorious claims against Dicerna and meritorious defenses and responses to the counterclaims and new federal claim now being asserted by Dicerna, as noted above, litigation is subject to inherent uncertainty and a court could ultimately rule against us.

ITEM 2. MANAGEMENT'S DI SCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.

This Quarterly Report on Form 10-Q contains forward-looking statements that involve risks and uncertainties. The statements contained in this Quarterly Report on Form 10-Q that are not purely historical are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended and Section 21E of the Securities Exchange Act of 1934, as amended. Without limiting the foregoing, the words "may," "will," "should," "could," "expects," "plans," "intends," "anticipates," "believes," "estimates," "predicts," "potential," "continue," "target," "goal" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these words. All forward-looking statements included in this Quarterly Report on Form 10-Q are based on information available to us up to, and including, the date of this document, and we expressly disclaim any obligation to update any such forward-looking statements to reflect events or circumstances that arise after the date hereof. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of certain important factors, including those set forth in this Item 2 — "Management's Discussion and Analysis of Financial Condition and Results of Operations," as well as under Part II, Item 1A — "Risk Factors" and elsewhere in this Quarterly Report on Form 10-Q. You should carefully review those factors and also carefully review the risks outlined in other documents that we file from time to time with the Securities and Exchange Commission, or SEC.

Overview

We are a biopharmaceutical company developing novel therapeutics based on RNA interference, or RNAi. RNAi is a naturally occurring biological pathway within cells for selectively silencing and regulating the expression of specific genes. Since many diseases are caused by the inappropriate activity of specific genes, the ability to silence genes selectively through RNAi could provide a new way to treat a wide range of human diseases. We believe that drugs that work through RNAi have the potential to become a broad new class of innovative medicines, and that this potential new drug class is similar to the opportunity created with other major biological discoveries such as recombinant DNA and monoclonal antibodies. Using our intellectual property and expertise, we are developing what we believe to be a reproducible and modular platform to develop RNAi therapeutics for a variety of human diseases.

Our research and development strategy is focused primarily on the use of our proprietary N-acetylgalactosamine, or GalNAc-conjugate platform for delivery of small interfering RNAs, or "siRNAs" — the molecules that mediate RNAi — toward genetically validated, liver-expressed target genes involved in the cause or pathway of human diseases. We are also focused on clinical indications where there are high unmet needs, early biomarkers for the assessment of clinical activity in Phase 1 clinical studies, and a definable path for drug development, regulatory approval, patient access and commercialization.

Specifically, our broad pipeline of investigational RNAi therapeutics is focused in three Strategic Therapeutic Areas, or "STArs:" Genetic Medicines, with multiple product candidates for the treatment of rare diseases; Cardio-Metabolic Diseases, with product candidates directed toward genetically validated, liver-expressed disease targets for unmet needs in cardiovascular and metabolic diseases; and Hepatic Infectious Diseases, with product candidates designed to address the major global health challenges of hepatic infectious diseases, beginning with hepatitis B and hepatitis D viral infections. We are focused on advancement of our *Alnylam 2020* strategy for the development and commercialization of RNAi therapeutics as a potential new class of innovative medicines. Specifically, our goal is to achieve, by the end of 2020, a company profile with three marketed products and ten RNAi therapeutic clinical programs, including four in late stages of development, across our three STArs. Our most advanced investigational RNAi therapeutic in development, patisiran, targets the transthyretin, or TTR, gene for the treatment of patients with polyneuropathy due to hereditary TTR-mediated amyloidosis, or hATTR amyloidosis. We expect to report top-line data from our ongoing APOLLO Phase 3 study of patisiran in mid-2017. Assuming that the APOLLO data are positive, we plan to submit our first new drug application, or NDA, and marketing authorization application, or MAA, for patisiran by the end of 2017. In July 2017, we announced the initiation of our ATLAS Phase 3 program for fitusiran. This global, multicenter clinical program is designed to evaluate the safety and efficacy of fitusiran in three separate trials, including patients with hemophilia A and B with or without inhibitors. In addition, we expect to advance givosiran, our investigational RNAi therapeutic for the treatment of acute hepatic porphyrias, into a Phase 3 program in late 2017, pending successful alignment on trial design with global regulatory authorities. Finally, our partner The Medicines Company, or MDCO, has announced its intention to initiate a Phase 3 study of inclisiran in patients with atherosclerotic cardiovascular disease in late 2017.

Based on our expertise in RNAi therapeutics and broad intellectual property estate, we have formed alliances with leading pharmaceutical and life sciences companies to support our development and commercialization efforts, including Sanofi Genzyme, the specialty care global business unit of Sanofi, and MDCO. We have incurred significant losses since we commenced operations in 2002 and expect such losses to continue for the foreseeable future. At June 30, 2017, we had an accumulated deficit of $1.88 billion. Historically, we have generated losses principally from costs associated with research and development activities, acquiring, filing and expanding intellectual property rights and general administrative costs. As a result of planned expenditures for research and development activities relating to our research platform, our drug development programs, including clinical trial and manufacturing costs, the establishment of late stage clinical and commercial capabilities, including European operations, the construction of our drug

substance manufacturing facility, continued management and growth of our intellectual property including our patent portfolio, collaborations and general corpo rate activities, we expect to incur additional operating losses for the foreseeable future. We also anticipate that our operating results will fluctuate for the foreseeable future. Therefore, period-to-period comparisons should not be relied upon as predic tive of the results in future periods.

Although we currently have multiple clinical development programs, we are unable to predict when, if ever, we will successfully develop or be able to commence sales of any product. A substantial portion of our total net revenues in recent years has been derived from collaboration revenues from strategic alliances with Takeda Pharmaceutical Company Limited, or Takeda, Monsanto Company, or Monsanto, Sanofi Genzyme and MDCO. We expect our sources of potential funding for the next several years to be derived primarily from existing and new strategic alliances, which may include license and other fees, funded research and development and milestone payments, and proceeds from the sale of equity or debt.

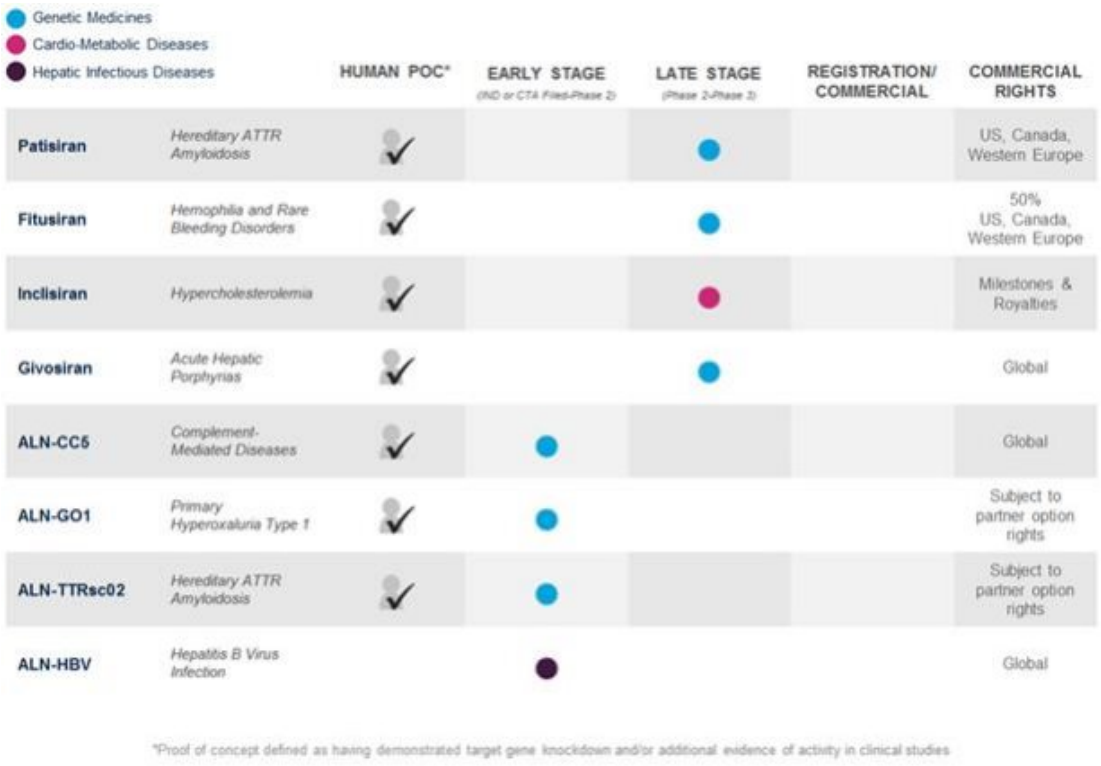
In May 2017, we sold an aggregate of 5,000,000 shares of our common stock through an underwritten public offering at a price to the public of $71.87 per share. As a result of the offering, we received aggregate net proceeds of $355.2 million, after deducting underwriting discounts and commissions and other offering expenses of $4.2 million. We intend to use these proceeds for general corporate purposes, including clinical trial costs and other research and development expenses, continued growth of our manufacturing, quality, commercial and medical affairs capabilities to support our transition toward a commercial-stage biopharmaceutical company, working capital, capital expenditures, and general and administrative expenses.

In addition, in May 2017, in connection with our public offering described above, Sanofi Genzyme exercised its right under our investor agreement to purchase directly from us, in a concurrent private placement, 297,501 shares of common stock, at the public offering price of $71.87 per share, resulting in proceeds to us of $21.4 million. The sale of common stock to Sanofi Genzyme was not registered as part of the public offering, though it was consummated simultaneously with the public offering. Sanofi Genzyme currently holds approximately 12 percent of our outstanding common stock.

Research and Development

Since our inception, we have focused on drug discovery and development programs. Research and development expenses represent a substantial percentage of our total operating expenses, as reflected by our broad pipeline of product development programs.

The following is a summary of our product development programs as of July 31, 2017, that identifies those programs in which we have achieved human proof of concept, or POC, by demonstrating target gene knockdown and/or additional evidence of activity in clinical studies, the development stage of our programs and our commercial rights to such programs:



During the second quarter of 2017 and recent period, we reported the following updates from our late-stage clinical programs:

- We continued to advance patisiran, presenting final 24-month data from our Phase 2 open-label extension, or OLE, study in April 2017. We expect to report top-line results from our APOLLO Phase 3 clinical study of patisiran in mid-2017. If the APOLLO Phase 3 data are positive, we expect to file our first NDA with the United States Food and Drug Administration, or FDA, in late 2017 and our MAA with the European Medicines Agency, or EMA, shortly thereafter.
- We continued to advance fitusiran, presenting positive new data from our Phase 2 OLE study in July 2017 and announcing, with Sanofi Genzyme, the initiation of our ATLAS Phase 3 program, a global, multicenter clinical program designed to evaluate the safety and efficacy of fitusiran in patients with hemophilia A and B with or without inhibitors.
- We continued to advance givosiran, presenting positive new data in June 2017 from our ongoing randomized, double-blind, placebo-controlled Phase 1 study in recurrent attack porphyria patients, as well as positive initial results from our ongoing Phase 1 OLE study.
    - In addition, in May 2017, we announced that the FDA has granted Breakthrough Therapy designation for givosiran for the prophylaxis of attacks in patients with acute hepatic porphyria. Breakthrough Therapy designation is granted by the FDA to expedite the development and review of new drugs that treat serious or life-threatening diseases where preliminary clinical evidence exists in support of substantial benefit over available therapies. The designation is aimed to help ensure that patients with unmet medical needs receive access to new therapies through FDA approval as soon as possible.
- We and MDCO announced agreement with the FDA on the Phase 3 clinical program for inclisiran, with LDL-C lowering as the primary endpoint for the initial pivotal trial program, which MDCO expects to initiate in late 2017.

There is a risk that any drug discovery or development program may not produce revenue for a variety of reasons, including the possibility that we will not be able to adequately demonstrate the safety and effectiveness of the product candidate. For example, in

October 2016, we announc ed the discontinuation of our revusiran clinical development program due to safety concerns. Moreover, there are uncertainties specific to any new field of drug discovery, including RNAi. The success of any product candidate we develop is highly uncertain. Due to the numerous risks associated with developing drugs, we cannot reasonably estimate or know the nature, timing and estimated costs of the efforts necessary to complete the development of, or the period, if any, in which material net cash inflows wil l commence from, any potential product candidate.

Any failure to complete any stage of the development of any potential products in a timely manner could have a material adverse effect on our operations, financial position and liquidity. A discussion of some of the risks and uncertainties associated with completing our projects on schedule, or at all, and the potential consequences of failing to do so, are set forth in Part II, Item 1A below under the heading "Risk Factors."

Strategic Alliances

Our business strategy is to develop and commercialize a broad pipeline of RNAi therapeutic products directed towards our three STArs. As part of this strategy, we have entered into, and expect to enter into additional, collaboration and licensing agreements as a means of obtaining resources, capabilities and funding to advance our investigational RNAi therapeutic programs.

Our collaboration strategy is to form alliances that create significant value for us and our collaborators in the advancement of RNAi therapeutics as a new class of innovative medicines. Specifically, with respect to our Genetic Medicine pipeline, we formed a broad strategic alliance with Sanofi Genzyme in 2014 pursuant to which we retain development and commercial rights for our current and future Genetic Medicine products in the United States, Canada and Western Europe, and Sanofi Genzyme will develop and commercialize our current and future Genetic Medicine products in the rest of the world, referred to as the Sanofi Genzyme Territory, subject to certain broader rights. In the case of patisiran, we are advancing the product in the United States, Canada and Western Europe, while Sanofi Genzyme will advance the product in the Sanofi Genzyme Territory. In the case of fitusiran, Sanofi Genzyme has elected to opt in to co-develop and co-commercialize fitusiran in the United States, Canada and Western Europe, in addition to developing and commercializing fitusiran in the Sanofi Genzyme Territory. With respect to our Cardio-Metabolic and Hepatic Infectious Disease pipelines, we intend to seek future strategic alliances for these programs, under which we may retain certain product development and commercialization rights, or which we may structure as global alliances, as we did in our collaboration with MDCO for the development and commercialization of our inclisiran program.

Intellectual Property

The strength of our intellectual property portfolio relating to the development and commercialization of siRNAs as therapeutics is essential to our business strategy. We own or license issued patents and pending patent applications in the United States and in key markets around the world claiming fundamental features of siRNAs and RNAi therapeutics as well as those claiming crucial chemical modifications and promising delivery technologies. Specifically, we have a portfolio of patents, patent applications and other intellectual property covering: fundamental aspects of the structure and uses of siRNAs, including their use as therapeutics, and RNAi-related mechanisms; chemical modifications to siRNAs that improve their suitability for therapeutic and other uses; siRNAs directed to specific targets as treatments for particular diseases; delivery technologies, such as in the fields of carbohydrate conjugates and cationic liposomes; and all aspects of our specific development candidates.

We believe that no other company possesses a portfolio of such broad and exclusive rights to the patents and patent applications required for the commercialization of RNAi therapeutics. In June 2017, the United States Patent and Trademark Office, or USPTO, issued Notices of Allowance for two patent applications owned by us, which we believe significantly enhances our leadership in intellectual property for RNAi therapeutics. In total, our intellectual property estate for RNAi therapeutics includes over 3,400 active cases and over 1,400 granted or issued patents, of which over 500 are issued or granted in the United States, the European Union, or EU, including by the European Patent Office, or EPO, and Japan. We continue to seek to grow our portfolio through the creation of new technology in this field. In addition, we are very active in our evaluation of third-party technologies.

Given the importance of our intellectual property portfolio to our business operations, we intend to vigorously enforce our rights and defend against challenges that have arisen or may arise in this area.

Critical Accounting Policies and Estimates

There have been no significant changes to our critical accounting policies since the beginning of this fiscal year. Our critical accounting policies are described in the "Management's Discussion and Analysis of Financial Condition and Results of Operations" section of our Annual Report on Form 10-K for the year ended December 31, 2016, which we filed with the SEC on February 15, 2017.

Results of Operations

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

	Three Months Ended June 30,		Six Months Ended June 30,	
	2017	2016	2017	2016
Net revenues from collaborators	$ 15,932	$ 8,709	$ 34,892	$ 16,054
Operating expenses	136,406	101,159	261,877	218,532
Loss from operations	(120,474)	(92,450)	(226,985)	(202,478)
Net loss	$ (118,420)	$ (90,129)	$ (225,710)	$ (193,103)

Discussion of Results of Operations

Net revenues from collaborators

We generate revenues through research and development collaborations. The following table summarizes our total consolidated net revenues from collaborators, for the periods indicated, in thousands, together with the changes, in thousands:

	Three Months Ended June 30,			Six Months Ended June 30,		
Description	2017	2016	Dollar Change	2017	2016	Dollar Change
Sanofi Genzyme	$ 14,375	$ 5,387	$ 8,988	$ 26,652	$ 9,802	$ 16,850
MDCO	1,522	3,268	(1,746)	7,886	5,925	1,961
Other	35	54	(19)	354	327	27
Total net revenues from collaborators	$ 15,932	$ 8,709	$ 7,223	$ 34,892	$ 16,054	$ 18,838

Net revenues from collaborators increased during the three and six months ended June 30, 2017 as compared to the three and six months ended June 30, 2016 due primarily to services performed by us in connection with our clinical development programs for which Sanofi Genzyme has opted-in, partially offset in the three months ended June 30, 2017 by a decrease in reimbursable activities under our agreement with MDCO. In addition, net revenues from collaborators increased during the six months ended June 30, 2017 due to additional reimbursable activities in the first quarter of 2017 under our agreement with MDCO.

We expect net revenues from collaborators to continue to increase during the second half of 2017 due primarily to an expected growth in revenues from Sanofi Genzyme related to increased reimbursement, as well as the expected receipt of a milestone payment under our agreement with Sanofi Genzyme upon the dosing of the first patient in our ATLAS Phase 3 program for fitusiran, the initiation of which we announced in July 2017, as well as the potential receipt of a milestone payment under our agreement with MDCO. The receipt and timing of any milestone payments will be dependent on the progress of our and MDCO's clinical development programs.

We had $81.9 million and $82.9 million of deferred revenue at June 30, 2017 and December 31, 2016, respectively, which consists primarily of payments we have received from collaborators, including Sanofi Genzyme, MDCO, Kyowa Hakko Kirin Co., Ltd. and Monsanto, but have not yet recognized pursuant to our revenue recognition policies.

For the foreseeable future, until we are successful in obtaining regulatory approval for our product candidates and successful in commercializing such products, we expect our revenues to be derived primarily from our alliances with Sanofi Genzyme and MDCO, as well as other strategic alliances and potential new collaborations and licensing activities.

Operating expenses

The following tables summarize our operating expenses for the periods indicated, in thousands and as a percentage of total operating expenses, together with the changes, in thousands:

Description	Three Months Ended June 30, 2017	% of Total Operating Expenses	Three Months Ended June 30, 2016	% of Total Operating Expenses	Dollar Change
Research and development	$ 90,627	66%	$ 83,172	82%	$ 7,455
General and administrative	45,779	34%	17,987	18%	27,792
Total operating expenses	$ 136,406	100%	$ 101,159	100%	$ 35,247

Description	Six Months Ended June 30, 2017	% of Total Operating Expenses	Six Months Ended June 30, 2016	% of Total Operating Expenses	Dollar Change
Research and development	$ 177,611	68%	$ 179,445	82%	$ (1,834)
General and administrative	84,266	32%	39,087	18%	45,179
Total operating expenses	$ 261,877	100%	$ 218,532	100%	$ 43,345

Research and development . The following tables summarize the components of our research and development expenses for the periods indicated, in thousands and as a percentage of total research and development expenses, together with the changes, in thousands:

Description	Three Months Ended June 30, 2017	% of Expense Category	Three Months Ended June 30, 2016	% of Expense Category	Dollar Change
Research and development					
Compensation and related	$ 23,895	26%	$ 21,391	26%	$ 2,504
Clinical trial	23,121	25%	23,640	28%	(519)
Stock-based compensation	13,254	15%	9,277	11%	3,977
Manufacturing	11,392	13%	6,433	8%	4,959
Facilities-related	7,868	9%	7,397	9%	471
External services	7,670	8%	9,970	12%	(2,300)
Lab supplies and materials	2,725	3%	1,883	2%	842
Other	702	1%	3,181	4%	(2,479)
Total research and development expenses	$ 90,627	100%	$ 83,172	100%	$ 7,455

Research and development expenses increased during the three months ended June 30, 2017 as compared to the three months ended June 30, 2016 due primarily to additional manufacturing expenses related to our late stage clinical trials. In addition, stock-based compensation expense increased as a result of our accounting for the achievement of certain performance-based stock option awards during the second quarter of 2017 in connection with the initiation of our ATLAS Phase 3 program for fitusiran.

Description	Six Months Ended June 30, 2017	% of Expense Category	Six Months Ended June 30, 2016	% of Expense Category	Dollar Change
Research and development					
Compensation and related	$ 46,518	26%	$ 42,461	24%	$ 4,057
Clinical trial	40,684	23%	43,897	24%	(3,213)
Manufacturing	29,467	16%	21,820	13%	7,647
Stock-based compensation	21,945	12%	23,633	13%	(1,688)
Facilities-related	15,526	9%	14,446	8%	1,080
External services	15,514	9%	22,962	13%	(7,448)
Lab supplies and materials	4,871	3%	3,717	2%	1,154
Other	3,086	2%	6,509	3%	(3,423)
Total research and development expenses	$ 177,611	100%	$ 179,445	100%	$ (1,834)

Research and development expenses remained relatively consistent during the six months ended June 30, 2017 as compared to the six months ended June 30, 2016. Manufacturing expenses related to our late stage clinical trials increased, partially offset by a decrease in external services expenses due to reduced pre-clinical activities.

We expect to continue to devote a substantial portion of our resources to research and development expenses to support our goals for 2020. We expect that research and development expenses will increase during second half of 2017 as we continue to develop our pipeline and advance our product candidates into later-stage development , but expect that certain expenses will be variable depending on the timing of manufacturing batches, clinical trial enrollment and results, regulatory review of our product candidates and programs and stock-based compensation expenses due to the potential vesting of performance-based awards.

A significant portion of our research and development costs are not tracked by project as they benefit multiple projects or our technology platform. However, certain of our collaboration agreements contain cost-sharing arrangements pursuant to which certain costs incurred under the project are reimbursed. Costs reimbursed under these agreements typically include certain direct external costs and a negotiated full-time equivalent labor rate for the actual time worked on the project. As a result, although a significant portion of our research and development expenses are not tracked on a project-by-project basis, we do track direct external costs attributable to, and the actual time our employees worked on, our collaborations.

General and administrative. The following tables summarize the components of our general and administrative expenses for the periods indicated, in thousands and as a percentage of total general and administrative expenses, together with the changes, in thousands:

Description	Three Months Ended June 30, 2017	% of Expense Category	Three Months Ended June 30, 2016	% of Expense Category	Dollar Change
General and administrative					
Consulting and professional services	$ 14,432	31%	$ 4,834	27%	$ 9,598
Compensation and related	12,696	28%	4,295	24%	8,401
Stock-based compensation	10,776	23%	6,539	36%	4,237
Facilities-related	2,564	6%	1,099	6%	1,465
Other	5,311	12%	1,220	7%	4,091
Total general and administrative expenses	$ 45,779	100%	$ 17,987	100%	$ 27,792

General and administrative expenses increased during the three months ended June 30, 2017 as compared to the three months ended June 30, 2016 due primarily to an increase in commercial and medical affairs headcount to support corporate growth and to prepare for the potential launch of our first commercial product. In addition, stock-based compensation expense increased as a result of our accounting for the achievement of certain performance-based stock option awards during the second quarter of 2017 in connection with the initiation of our ATLAS Phase 3 program for fitusiran.

Description	Six Months Ended June 30, 2017	% of Expense Category	Six Months Ended June 30, 2016	% of Expense Category	Dollar Change
General and administrative					
Consulting and professional services	$ 27,564	33%	$ 10,006	26%	$ 17,558
Compensation and related	25,941	31%	8,696	22%	17,245
Stock-based compensation	17,802	21%	15,663	40%	2,139
Facilities-related	4,777	5%	2,117	5%	2,660
Other	8,182	10%	2,605	7%	5,577
Total general and administrative expenses	$ 84,266	100%	$ 39,087	100%	$ 45,179

General and administrative expenses increased during the six months ended June 30, 2017 as compared to the six months ended June 30, 2016 due primarily to an increase in commercial and medical affairs headcount to support corporate growth and to prepare for the potential launch of our first commercial product.

We expect that general and administrative expenses will increase during the second half of 2017 as we continue to grow our operations, including the continued build-out of our commercial infrastructure, but expect that stock-based compensation expenses will be variable due to the potential vesting of performance-based awards.

Liquidity and Capital Resources

The following table summarizes our cash flow activities for the periods indicated, in thousands:

	Six Months Ended June 30,	
	2017	2016
Net loss	$ (225,710)	$ (193,103)
Adjustments to reconcile net loss to net cash used in operating activities	49,389	42,579
Changes in operating assets and liabilities	(5,058)	(3,304)
Net cash used in operating activities	(181,379)	(153,828)
Net cash provided by investing activities	7,405	73,605
Net cash provided by financing activities	389,028	170,404
Net increase in cash and cash equivalents	215,054	90,181
Cash and cash equivalents, beginning of period	193,617	180,895
Cash and cash equivalents, end of period	$ 408,671	$ 271,076

Since we commenced operations in 2002, we have generated significant losses. At June 30, 2017, we had an accumulated deficit of $1.88 billion. At June 30, 2017, we had cash, cash equivalents and fixed income marketable securities of $1.10 billion, compared to $942.6 million at December 31, 2016, in each case excluding the $150.0 million of restricted investments related to our term loan agreements.

In May 2017, we sold an aggregate of 5,000,000 shares of our common stock through an underwritten public offering at a price to the public of $71.87 per share. As a result of the offering, we received aggregate net proceeds of $355.2 million, after deducting underwriting discounts and commissions and other offering expenses of $4.2 million. We intend to use these proceeds for general corporate purposes, including clinical trial costs and other research and development expenses, continued growth of our manufacturing, quality, commercial and medical affairs capabilities to support our transition toward a commercial-stage biopharmaceutical company, working capital, capital expenditures, and general and administrative expenses.

Sanofi Genzyme has certain rights to purchase additional shares from us under our investor agreement. In May 2017, in connection with our public offering described above, Sanofi Genzyme exercised its right to purchase directly from us, in a concurrent private placement, 297,501 shares of common stock, resulting in proceeds to us of $21.4 million. In addition, Sanofi Genzyme has the right at the beginning of each year to purchase a number of shares of our common stock based on the number of shares we issued during the previous year for compensation-related purposes. Sanofi Genzyme exercised this right to purchase directly from us 205,030 shares of our common stock on February 1, 2016 for $14.3 million. In January 2017, Sanofi Genzyme elected not to exercise its compensation-related right for 2016. Sanofi Genzyme currently holds approximately 12 percent of our outstanding common stock.

We invest primarily in money market funds, U.S. government-sponsored enterprise securities, U.S. treasury securities, high-grade corporate notes, certificates of deposit and commercial paper. Corporate notes may also include foreign bonds denominated in U.S. dollars. Our investment objectives are, primarily, to assure liquidity and preservation of capital and, secondarily, to obtain investment income. All of our investments in debt securities are recorded at fair value and are available-for-sale. Fair value is determined based on quoted market prices and models using observable data inputs. We have not recorded any impairment charges to our fixed income marketable securities during the six months ended June 30, 2017 or 2016.

Operating activities

We have required significant amounts of cash to fund our operating activities as a result of net losses since our inception. Cash used in operating activities is adjusted for non-cash items to reconcile net loss to net cash used in operating activities. These non-cash adjustments have historically included stock-based compensation, intraperiod tax allocation, and depreciation and amortization.

We expect that we will require significant amounts of cash to fund our operating activities for the foreseeable future as we continue to execute on our *Alnylam 2020* strategy through the advancement of our research, development, pre-commercial and potentially commercial initiatives. The actual amount of overall expenditures will depend on numerous factors, including the timing of expenses, the timing and terms of collaboration agreements or other strategic transactions, if any, and the timing and progress of our research, development and commercialization efforts.

The increase in net cash used in operating activities for the six months ended June 30, 2017 compared to the six months ended June 30, 2016 was primarily due to an increase in our net loss resulting from additional activities to support corporate growth and to prepare for the potential launch of our first commercial product.

Investing activities

For the six months ended June 30, 2017 and 2016, net cash provided by investing activities was due primarily to activity related to our fixed income marketable securities in accordance with management of our liquidity needs. For the six months ended June 30, 2017 and 2016, there were purchases of property, plant and equipment of $57.8 million and $24.4 million, respectively, primarily in connection with our construction of our drug substance manufacturing facility. For the six months ended June 30, 2016, there were $150.0 million of purchases of restricted investments related to the term loan agreements.

Financing activities

For the six months ended June 30, 2017, net cash of $389.0 million provided by financing activities was due primarily to proceeds of $355.2 million received from our May 2017 underwritten public offering and proceeds of $21.4 million received from our issuance of common stock to Sanofi Genzyme in May 2017. For the six months ended June 30, 2016, net cash of $170.4 million provided by financing activities was due primarily to our term loan agreements, as well as proceeds of $14.3 million received from our issuance of common stock to Sanofi Genzyme in February 2016.

Operating Capital Requirements

We do not know when, if ever, we will successfully develop or be able to commence sales of any product. Therefore, we anticipate that we will continue to generate significant losses for the foreseeable future as a result of planned expenditures for research and development activities relating to our research platform, our drug development programs, including clinical trial and manufacturing costs, the establishment of late stage clinical and commercial capabilities, including European operations, continued management and growth of our intellectual property including our patent portfolio, collaborations and general corporate activities. In addition, we are expanding our manufacturing capabilities, including through construction of a drug substance manufacturing facility in Norton, Massachusetts. In April 2016, our subsidiary, Alnylam U.S., Inc., entered into an aggregate of $150.0 million in term loan agreements, for which we are the guarantor, related to the build out of our new drug substance manufacturing facility, that mature in April 2021. Interest on the borrowings is calculated based on LIBOR plus 0.45 percent. The obligations under the term loan agreements are secured by cash collateral in an amount equal to, at any given time, at least 100 percent of the principal amount of all term loans outstanding under the agreements at such time.

Based on our current operating plan, we believe that our existing cash, cash equivalents and fixed income marketable securities, including the proceeds from our public offering and Sanofi Genzyme's purchase of additional shares of our common stock in May 2017, together with the cash we expect to generate under our current alliances, will be sufficient to enable us to advance our *Alnylam 2020* strategy for at least the next few years. For reasons discussed below, we may require significant additional funds earlier than we currently expect in order to develop, conduct clinical trials for, manufacture and commercialize any product candidates.

In the future, we may seek additional funding through additional collaborative arrangements and public or private financings. Additional funding may not be available to us on acceptable terms or at all. Moreover, the terms of any additional financing may further adversely affect the holdings or the rights of our stockholders. For example, if we raise additional funds by issuing equity securities, further dilution to our existing stockholders will result. In addition, as a condition to providing additional funds to us, future investors may demand, and may be granted, rights superior to those of existing stockholders. If we are unable to obtain funding on a timely basis, we may be required to significantly delay or curtail one or more of our research or development programs and our ability to achieve our goals for 2020 may be delayed or diminished. We also could be required to seek funds through arrangements with collaborators or others that may require us to relinquish rights to some of our technologies, product candidates or products that we would otherwise pursue on our own.

Even if we are able to raise additional funds in a timely manner, our future capital requirements may vary from what we expect and will depend on many factors, including:

- our progress in demonstrating that siRNAs can be active as drugs and achieve desired clinical effects;
- progress in our research and development programs, as well as what may be required by regulatory bodies to advance these programs;
- the timing, receipt and amount of milestone and other payments, if any, from present and future collaborators, if any;
- our ability to maintain and establish additional collaborative arrangements and/or new business initiatives;
- the resources, time and costs required to successfully initiate and complete our pre-clinical and clinical trials, obtain regulatory approvals, prepare for commercialization of our product candidates and obtain and maintain licenses to third-party intellectual property;
- our ability to establish, maintain and operate our own manufacturing facilities in a timely and cost effective manner;

- o ur ability to manufacture, or contract with third-parties for the manufacture of, our product candidates for clinical testing and commercial sale;
- the resources, time and cost required for the preparation, filing, prosecution, maintenance and enforcement of patent claims;
- the costs associated with legal activities, including litigation, arising in the course of our business activities and our ability to prevail in any such legal disputes; and
- the timing, receipt and amount of sales and royalties, if any, from our potential products.

Contractual Obligations and Commitments

The disclosure of our contractual obligations and commitments is set forth under the heading "Management's Discussion and Analysis of Financial Condition and Results of Operations—Contractual Obligations" in our Annual Report on Form 10-K for the year ended December 31, 2016. There have been no material changes in our contractual obligations and commitments since December 31, 2016.

Recent Accounting Pronouncements

Please read Note 1 to our condensed consolidated financial statements included in Item 1, "Financial Statements (Unaudited)," of this Quarterly Report on Form 10-Q for a description of recent accounting pronouncements applicable to our business.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

As part of our investment portfolio, we own financial instruments that are sensitive to market risks. The investment portfolio is used to preserve our capital until it is required to fund operations, including our research and development activities. Our fixed income marketable securities consist primarily of U.S. government-sponsored enterprise securities, U.S. treasury securities, high-grade corporate notes, and commercial paper. Corporate notes may also include foreign bonds denominated in U.S. dollars. All of our investments in debt securities are classified as available-for-sale and are recorded at fair value. Our available-for-sale investments in debt securities are sensitive to changes in interest rates and changes in the credit ratings of the issuers. Interest rate changes would result in a change in the net fair value of these financial instruments due to the difference between the market interest rate and the market interest rate at the date of purchase of the financial instrument. If market interest rates were to increase immediately and uniformly by 50 basis points, or one-half of a percentage point, from levels at June 30, 2017, the net fair value of our interest-sensitive financial instruments would have resulted in a hypothetical decline of $2.2 million. We currently do not seek to hedge this exposure to fluctuations in interest rates. A downgrade in the credit rating of an issuer of a debt security or further deterioration of the credit markets could result in a decline in the fair value of the debt instruments. Our investment guidelines prohibit investment in auction rate securities and we do not believe we have any direct exposure to losses relating from mortgage-based securities or derivatives related thereto such as credit-default swaps. Historically, foreign currency fluctuations have not been material. We did not record any impairment charges to our fixed income marketable securities during the six months ended June 30, 2017.

ITEM 4. CONTROLS AND PROCEDURES.

Our management, with the participation of our chief executive officer (principal executive officer) and senior vice president, chief financial officer (principal financial officer), evaluated the effectiveness of our disclosure controls and procedures as of June 30, 2017. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on the evaluation of our disclosure controls and procedures as of June 30, 2017, our chief executive officer and senior vice president, chief financial officer concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

No change in our internal control over financial reporting (as defined in Rules 13a–15(f) and 15d–15(f) under the Exchange Act) occurred during the three months ended June 30, 2017 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHE R INFORMATION

ITEM 1. LEGAL PROCEEDINGS.

For a discussion of material pending legal proceedings, please read Note 5, Commitments and Contingencies – Litigation, to our condensed consolidated financial statements included in Part I, Item I, "Financial Statements (Unaudited)," of this quarterly report on Form 10-Q, which is incorporated into this item by reference.

ITEM 1A. RISK FACTORS

Our business is subject to numerous risks. We caution you that the following important factors, among others, could cause our actual results to differ materially from those expressed in forward-looking statements made by us or on our behalf in filings with the SEC, press releases, communications with investors and oral statements. All statements other than statements relating to historical matters should be considered forward-looking statements. When used in this report, the words "believe," "expect," "plan," "anticipate," "estimate," "predict," "may," "could," "should," "intend," "will," "target," "goal" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these words. Any or all of our forward-looking statements in this quarterly report on Form 10-Q and in any other public statements we make may turn out to be wrong. They can be affected by inaccurate assumptions we might make or by known or unknown risks and uncertainties. Many factors mentioned in the discussion below will be important in determining future results. Consequently, no forward-looking statement can be guaranteed. Actual future results may vary materially from those anticipated in forward-looking statements. We explicitly disclaim any obligation to update any forward-looking statements to reflect events or circumstances that arise after the date hereof. You are advised, however, to consult any further disclosure we make in our reports filed with the SEC.

Risks Related to Our Business

Risks Related to Being a Clinical Stage Company

Although we have product candidates in late stage clinical development, there is limited information about our ability to successfully overcome many of the risks and uncertainties encountered by companies in the biopharmaceutical industry.

Although we have product candidates in late stage clinical development, we have limited experience and have not yet demonstrated an ability to successfully overcome many of the risks and uncertainties frequently encountered by companies in new and rapidly evolving fields, particularly in the biopharmaceutical area. For example, to execute our business plan, we will need to successfully:

- execute product development activities using unproven technologies related to both RNAi and to the delivery of siRNAs to the relevant tissues and cells;
- build and maintain a strong intellectual property portfolio;
- gain regulatory acceptance for the development and commercialization of our product candidates and market success for any products we commercialize;
- develop and maintain successful strategic alliances; and
- manage our spending as costs and expenses increase due to clinical trials, regulatory approvals and commercialization.

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

The approach we are taking to discover and develop novel RNAi therapeutics is unproven and may never lead to marketable products.

We have concentrated our efforts and therapeutic product research and development on RNAi technology and our future success depends on the successful development of this technology and products based on it. Neither we nor any other company has received regulatory approval to market therapeutics utilizing siRNAs, the class of molecule we are trying to develop into drugs. The scientific discoveries that form the basis for our efforts to discover and develop new drugs are relatively new. The scientific evidence to support the feasibility of developing drugs based on these discoveries is both early stage and limited. Skepticism as to the feasibility of developing RNAi therapeutics has been expressed in scientific literature. For example, there are potential challenges to achieving safe RNAi therapeutics based on the so-called off-target effects and activation of the interferon response. In addition, decisions by other companies with respect to their RNAi development efforts or their adoption of different or related technologies and the potential success of any such different or related technologies may increase skepticism in the marketplace regarding the potential for RNAi therapeutics.

Relatively few product candidates based on these discoveries have ever been tested in humans. siRNAs may not naturally possess the inherent properties typically required of drugs, such as th e ability to be stable in the body, or the ability to enter cells within relevant tissues in order to exert their effects. We currently have limited data to suggest that we can introduce these properties into siRNAs. We have spent and expect to continue to spend large amounts of money trying to develop siRNAs that possess the properties typically required of drugs, and we may never succeed in doing so. In addition, these compounds may not demonstrate in patients the chemical and pharmacological properties a scribed to them in laboratory studies, and they may interact with human biological systems in unforeseen, ineffective or harmful ways. For example, in October 2016, we discontinued development of revusiran, an investigational RNAi therapeutic that was in d evelopment for the treatment of patients with cardiomyopathy due to hATTR amyloidosis, due to safety concerns. We conducted a comprehensive evaluation of the revusiran data and reported the results of this evaluation on August 9, 2017. We may never succee d in developing a marketable product, we may not become profitable and the value of our common stock will decline.

Further, our focus solely on RNAi technology for developing drugs, as opposed to multiple, more proven technologies for drug development, increases the risks associated with the ownership of our common stock. If we are not successful in developing a product candidate using RNAi technology, we may be required to change the scope and direction of our product development activities. In that case, we may not be able to identify and implement successfully an alternative product development strategy.

Risks Related to Our Financial Results and Need for Financing

We have a history of losses and may never become and remain consistently profitable.

We have experienced significant operating losses since our inception. At June 30, 2017, we had an accumulated deficit of $1.88 billion. To date, we have not received regulatory approval to market or sell any products nor generated any revenues from the sale of products. Further, we do not expect to generate any product revenues until at the earliest 2018, assuming we receive marketing approval for patisiran. We expect to continue to incur annual net operating losses over the next several years and will require substantial resources over the next several years as we expand our efforts to discover, develop and commercialize RNAi therapeutics. Until we are successful in obtaining regulatory approval for our product candidates and successful in commercializing such products, we anticipate that the majority of any revenues we generate over the next several years will be from alliances with pharmaceutical and biotechnology companies, but cannot be certain that we will be able to maintain our existing alliances or secure and maintain new alliances, or meet the obligations or achieve any milestones that we may be required to meet or achieve to receive payments. We anticipate that revenues derived from such sources will not be sufficient to make us consistently profitable.

We believe that to become and remain consistently profitable, we must succeed in discovering, developing and commercializing novel drugs with significant market potential. This will require us to be successful in a range of challenging activities, including pre-clinical testing and clinical trial stages of development, obtaining regulatory approval and reimbursement for these novel drugs and manufacturing, marketing and selling them. We may never succeed in these activities, and may never generate revenues that are significant enough to achieve profitability. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. If we cannot become and remain consistently profitable, the market price of our common stock could decline. In addition, we may be unable to raise capital, expand our business, develop additional product candidates or continue our operations.

We will require substantial additional funds to complete our research and development activities and if additional funds are not available, we may need to critically limit, significantly scale back or cease our operations.

We have used substantial funds to develop our RNAi technologies and will require substantial funds to conduct further research and development, including pre-clinical testing and clinical trials of our product candidates, and to manufacture, market and sell any products that are approved for commercial sale. Because we cannot be certain of the length of time or activities associated with successful development of our product candidates, we are unable to estimate the actual funds we will require to develop and commercialize them.

Our future capital requirements and the period for which we expect our existing resources to support our operations may vary from what we expect. We have based our expectations on a number of factors, many of which are difficult to predict or are outside of our control, including:

- our progress in demonstrating that siRNAs can be active as drugs and achieve desired clinical effects;
- progress in our research and development programs, as well as what may be required by regulatory bodies to advance these programs;
- the timing, receipt and amount of milestone and other payments, if any, from present and future collaborators, if any;
- our ability to maintain and establish additional collaborative arrangements and/or new business initiatives;

- the resources, time and co sts required to initiate and complete our pre-clinical and clinical studies, obtain regulatory approvals, prepare for the commercialization of our product candidates, and obtain and maintain licenses to third-party intellectual property;
- our ability to establish, maintain and operate our own manufacturing facilities in a timely and cost effective manner;
- our ability to manufacture, or contract with third parties for the manufacture of, our product candidates for clinical testing and commercial sale;
- the resources, time and cost required for the preparation, filing, prosecution, maintenance and enforcement of patent claims;
- the costs associated with legal activities, including litigation, arising in the course of our business activities and our ability to prevail in any such legal disputes; and
- the timing, receipt and amount of sales and royalties, if any, from our potential products.

If our estimates and predictions relating to these factors are incorrect, we may need to modify our operating plan.

Even if our estimates are correct, we will be required to seek additional funding in the future and intend to do so through either collaborative arrangements, public or private equity offerings or debt financings, or a combination of one or more of these funding sources. Additional funds may not be available to us on acceptable terms or at all.

In April 2016, our subsidiary, Alnylam U.S., Inc., entered into an aggregate of $150.0 million in term loan agreements, for which we are the guarantor, related to the build out of our new drug substance manufacturing facility, that mature in April 2021. Interest on the borrowings is calculated based on LIBOR plus 0.45 percent. During an event of default under either agreement, the obligations under such agreement will bear interest at a rate per annum equal to the interest rate then in effect plus two percent. The obligations under the term loan agreements are secured by cash collateral in an amount equal to, at any given time, at least 100 percent of the principal amount of all term loans outstanding under the credit agreements at such time. The agreements include restrictive covenants that could limit our flexibility in conducting future business activities and further limit our ability to change the nature of our business and, in the event of insolvency, the lenders would be paid before holders of equity securities received any distribution of corporate assets. If an event of default occurs, the interest rate would increase and the lenders would be entitled to take various actions, including the acceleration of amounts due under the loan. Our ability to satisfy our obligations under these agreements and meet our debt service obligations will depend upon our future performance, which will be subject to financial, business and other factors affecting our operations, many of which are beyond our control.

In addition, the terms of any financing may adversely affect the holdings or the rights of our stockholders. For example, if we raise additional funds by issuing equity securities, further dilution to our existing stockholders will result. In addition, as a condition to providing additional funding to us, future investors may demand, and may be granted, rights superior to those of existing stockholders. Moreover, our investor agreement with Sanofi Genzyme provides Sanofi Genzyme with the right, subject to certain exceptions, generally to maintain its ownership position in us until Sanofi Genzyme owns less than 7.5 percent of our outstanding common stock, subject to certain additional limited rights of Sanofi Genzyme to maintain its ownership percentage. In accordance with the investor agreement, as a result of our issuance of shares in connection with our acquisition of Sirna in March 2014, Sanofi Genzyme exercised its right to purchase an additional 344,448 shares of our common stock. In January 2015, Sanofi Genzyme also exercised its right to purchase 196,251 shares based on its 2014 compensation-related right and its right to purchase 744,566 shares in connection with our public offering. In February 2016, Sanofi Genzyme purchased an additional 205,030 shares based on its 2015 compensation-related right. In May 2017, Sanofi Genzyme also exercised its right to purchase 297,501 shares in connection with our public offering. These purchases allowed Sanofi Genzyme to maintain its ownership level of approximately 12 percent of our outstanding common stock. While the exercise of these rights by Sanofi Genzyme has provided us with an additional $147.7 million in cash to date, and while any exercise of these rights by Sanofi Genzyme in the future will provide us with further additional cash, these exercises have caused, and any future exercise of these rights by Sanofi Genzyme will also cause further, dilution to our stockholders. In January 2017, Sanofi Genzyme elected not to exercise its compensation-related right for 2016. In November 2016, Sanofi Genzyme elected to expand its regional rights for fitusiran and opt-in to co-develop and co-commercialize fitusiran in the United States, Canada and Western Europe, in addition to developing and commercializing the product in the Sanofi Genzyme Territory. In connection with the exercise of this right, Sanofi Genzyme paid us in January 2017 for its incremental share of co-development costs incurred from January 2016 to September 2016, in accordance with the 2014 Sanofi Genzyme collaboration. Going forward, Sanofi Genzyme will share in 50 percent of certain development and sales and marketing costs for fitusiran, which will result in increased expense reimbursement to us.

If we are unable to obtain additional funding on a timely basis, we may be required to significantly delay or curtail one or more of our research or development programs or undergo future reductions in our workforce or other corporate restructuring activities, and our ability to achieve our strategy for 2020 may be delayed or diminished. We also could be required to seek funds through arrangements with collaborators or others that may require us to relinquish rights to some of our technologies, product candidates or products that we would otherwise pursue on our own.

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

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

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

At June 30, 2017, we had $1.10 billion in cash, cash equivalents and fixed income marketable securities, excluding the $150.0 million of restricted investments related to our term loan agreements. We historically have invested these amounts in high–grade corporate notes, commercial paper, securities issued or sponsored by the U.S. government, certificates of deposit and money market funds meeting the criteria of our investment policy, which is focused on the preservation of our capital. Corporate notes may also include foreign bonds denominated in U.S. dollars. These investments are subject to general credit, liquidity, market and interest rate risks. We may realize losses in the fair value of these investments or a complete loss of these investments, which would have a negative effect on our condensed consolidated financial statements. In addition, should our investments cease paying or reduce the amount of interest paid to us, our interest income would suffer. The market risks associated with our investment portfolio may have an adverse effect on our results of operations, liquidity and financial condition.

Risks Related to Our Dependence on Third Parties

We may not be able to execute our business strategy if we are unable to enter into alliances with other companies that can provide business and scientific capabilities and funds for the development and commercialization of our product candidates. If we are unsuccessful in forming or maintaining these alliances on terms favorable to us, our business may not succeed.

We do not currently have any capability for sales or distribution and have early capability for marketing, sales and market access, as well as limited capacity for drug development due to our growing pipeline of RNAi therapeutic opportunities. Accordingly, we have entered into alliances with other companies and collaborators that we believe can provide such capabilities in certain territories, and we intend to enter into additional such alliances in the future. Our collaboration strategy is to form alliances that create significant value for us and our collaborators in the advancement of RNAi therapeutics as a new class of innovative medicines. Specifically, with respect to our Genetic Medicine pipeline, we formed a broad strategic alliance with Sanofi Genzyme in 2014 pursuant to which we retain development and commercial rights for our current and future Genetic Medicine products in the United States, Canada and Western Europe, and Sanofi Genzyme has the right to develop and commercialize our current and future Genetic Medicine products principally in the rest of the world, subject to certain broader rights. With respect to our Cardio-Metabolic and Hepatic Infectious Disease pipelines, we intend to seek future strategic alliances for these programs, under which we may retain certain product development and commercialization rights, or we may structure as global alliances, as we did in our collaboration with MDCO to advance inclisiran.

In such alliances, we expect our current, and may expect our future, collaborators to provide substantial capabilities in clinical development, regulatory affairs, and/or marketing, sales and distribution. Under certain of our alliances, we also may expect our collaborators to develop, market and/or sell certain of our product candidates. We may have limited or no control over the development, sales, marketing and distribution activities of these third parties. Our future revenues may depend heavily on the success of the efforts of these third parties. For example, we will rely entirely on (i) Sanofi Genzyme for the development and commercialization of patisiran, fitusiran and potentially other of our Genetic Medicine programs in territories outside of the United States, Canada and Western Europe, and (ii) MDCO for all future development and commercialization of inclisiran worldwide. If Sanofi Genzyme and/or MDCO are not successful in their commercialization efforts, our future revenues from RNAi therapeutics for these indications may be adversely affected. In addition, Sanofi Genzyme may elect not to opt into one or more of our Genetic Medicine programs. For example, during 2016, Sanofi Genzyme elected not to take a regional license for our givosiran and ALN-CC5 programs. While we intend to advance these programs independently, retaining global development and commercial rights, our ability to advance these programs and successfully develop and commercialize these product candidates may be adversely affected as a result of Sanofi Genzyme's decision.

We may not be successful in entering into future alliances on terms favorable to us due to various factors, including our ability to successfully demonstrate proof of concept for our technology in humans, our ability to demonstrate the safety and efficacy of our specific drug candidates, our ability to manufacture or have third parties manufacture RNAi therapeutics, the strength of our intellectual property and/or concerns around challenges to our intellectual property. For example, our decision in October 2016 to discontinue development of revusiran could make it more difficult for us to attract collaborators due to concerns around the safety

and/or efficacy of our technology platform or product candidates. Even if we do succeed in securing any such alliances, we may not be able to maintain them if, for example, development or approval of a product candidate is delayed, challenges are raised as to the validity or scope of our intellectual property, we are unable to secure adequate reimbursement from payors or sales of an approved drug are lower than we expected.

Furthermore, any delay in entering into collaboration agreements would likely either delay the development and commercialization of certain of our product candidates and reduce their competitiveness even if they reach the market, or prevent the development of certain product candidates. Any such delay related to our collaborations could adversely affect our business.

For certain product candidates that we may develop, we have formed collaborations to fund all or part of the costs of drug development and commercialization, such as our collaborations with Sanofi Genzyme and MDCO. We may not, however, be able to enter into additional collaborations for certain other programs, and the terms of any collaboration agreement we do secure may not be favorable to us. If we are not successful in our efforts to enter into future collaboration arrangements with respect to one or more of our product candidates, we may not have sufficient funds to develop that or other product candidates internally, or to bring our product candidates to market. If we do not have sufficient funds to develop and bring our product candidates to market, we will not be able to generate revenues from these product candidates, and this will substantially harm our business.

If any collaborator terminates or fails to perform its obligations under agreements with us, the development and commercialization of our product candidates could be delayed or terminated.

Our dependence on collaborators for capabilities and funding means that our business could be adversely affected if any collaborator terminates its collaboration agreement with us or fails to perform its obligations under that agreement. Our current or future collaborations, if any, may not be scientifically or commercially successful. Disputes may arise in the future with respect to the ownership of rights to technology or products developed with collaborators, which could have an adverse effect on our ability to develop and commercialize any affected product candidate.

Our current collaborations allow, and we expect that any future collaborations will allow, either party to terminate the collaboration for a material breach by the other party. In addition, our collaborators may have additional termination rights for convenience with respect to the collaboration or a particular program under the collaboration, under certain circumstances. Moreover, our agreement with MDCO relating to the development and commercialization of inclisiran worldwide may be terminated by MDCO at any time upon four months' prior written notice. If we were to lose a commercialization collaborator, we would have to attract a new collaborator or develop expanded sales, distribution and marketing capabilities internally, which would require us to invest significant amounts of financial and management resources.

In addition, if we have a dispute with a collaborator over the ownership of technology or other matters, or if a collaborator terminates its collaboration with us, for breach or otherwise, or determines not to pursue the research, development and/or commercialization of RNAi therapeutics, it could delay our development of product candidates, result in the need for additional company resources to develop product candidates, require us to expend time and resources to develop expanded sales and marketing capabilities outside of the United States and EU on a more expedited timeline, make it more difficult for us to attract new collaborators and could adversely affect how we are perceived in the business and financial communities. For example, in March 2011, Arbutus Biopharma Corporation, or ABC (formerly Tekmira Pharmaceuticals Corporation) and Protiva Biotherapeutics, Inc., a wholly owned subsidiary of ABC, and together with ABC, referred to as Arbutus, filed a civil complaint against us claiming, among other things, misappropriation of its confidential and proprietary information and trade secrets. As a result of the litigation, which was settled in November 2012, we were required to expend resources and management attention that would otherwise have been engaged in other activities. In addition, in August 2013, we initiated binding arbitration proceedings to resolve a disagreement with Arbutus regarding the achievement by Arbutus of a $5.0 million milestone payment under our cross-license agreement relating to the manufacture of ALN-VSP clinical trial material for use in China. The Arbutus arbitration hearing was held in May 2015. In March 2016, the arbitration panel ruled in our favor and as a result, no milestone payment is due to Arbutus at this time. The grounds on which Arbutus could appeal this ruling were limited and Arbutus did not appeal by the deadline.

Moreover, a collaborator, or in the event of a change in control of a collaborator or the assignment of a collaboration agreement to a third party, the successor entity or assignee, could determine that it is in its interests to:

- pursue alternative technologies or develop alternative products, either on its own or jointly with others, that may be competitive with the products on which it is collaborating with us or which could affect its commitment to the collaboration with us;
- pursue higher-priority programs or change the focus of its development programs, which could affect the collaborator's commitment to us; or
- if it has marketing rights, choose to devote fewer resources to the marketing of our product candidates, if any are approved for marketing, than it does for product candidates developed without us.

If any of these occur, the development and commercialization of one or more product candidates could be delayed, curtailed or terminated because we may not have sufficient fi nancial resources or capabilities to continue such development and commercialization on our own.

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

We rely on independent clinical investigators, contract research organizations and other third-party service providers to assist us in managing, monitoring and otherwise carrying out our clinical trials. We have contracted, and we plan to continue to contract with, certain third parties to provide certain services, including site selection, enrollment, monitoring and data management services. Although we depend heavily on these parties, we control only certain aspects of their activity and therefore, we cannot be assured that these third parties will adequately perform all of their contractual obligations to us in compliance with regulatory and other legal requirements and our internal policies and procedures. Nevertheless, we are responsible for ensuring that each of our studies is conducted in accordance with the applicable protocol, legal, regulatory and scientific standards, and our reliance on third parties does not relieve us of our regulatory responsibilities. We and our contract research organizations are required to comply with good clinical practice, or GCP, requirements, which are regulations and guidelines enforced by the FDA and comparable foreign regulatory authorities for all of our product candidates in clinical development. Regulatory authorities enforce these GCP requirements through periodic inspections of trial sponsors, principal investigators and trial sites. If we or any of our contract research organizations fail to comply with applicable GCP requirements, the clinical data generated in our clinical trials may be deemed unreliable and the FDA, the EMA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical trials comply with GCP regulations.

If our third-party service providers cannot adequately and timely fulfill their obligations to us, or if the quality and accuracy of our clinical trial data is compromised due to failure by such third party to adhere to our protocols or regulatory requirements or if such third parties otherwise fail to meet deadlines, our development plans and/or regulatory reviews for marketing approvals may be delayed or terminated. As a result, our results of operations and the commercial prospects for our product candidates would be harmed, our costs could increase and our ability to generate revenues could be delayed.

We have limited manufacturing experience and resources and we must incur significant costs to develop this expertise and/or rely on third parties to manufacture our products.

We have limited manufacturing experience. In order to develop our product candidates, apply for regulatory approvals and commercialize our products, if approved, we will need to develop, contract for, or otherwise arrange for the necessary manufacturing capabilities. Historically, our internal manufacturing capabilities were limited to small-scale production of material for use in *in vitro* and *in vivo* experiments that is not required to be produced under current good manufacturing practices, or cGMP, standards. During 2012, we developed cGMP capabilities and processes for the manufacture of patisiran formulated bulk drug product for late stage clinical trial use and commercial supply. In addition, in April 2016, we completed our purchase of a parcel of land in Norton, Massachusetts, where we have commenced construction of a cGMP manufacturing facility for drug substance, including siRNAs and siRNA conjugates, for clinical and commercial use.

We may manufacture limited quantities of clinical trial materials ourselves, but otherwise we currently rely on third parties to manufacture the drug substance and, with the exception of patisiran, the finished product we will require for any clinical trials that we initiate and to support the commercial launch of our first several products. There are a limited number of manufacturers that supply synthetic siRNAs. We currently rely on a limited number of contract manufacturing organizations, or CMOs, for our supply of synthetic siRNAs. For example, in July 2015, we amended our manufacturing agreement with Agilent, to provide for Agilent to supply, subject to any conflicting obligations under our third-party agreements, a specified percentage of the active pharmaceutical ingredients required for certain of our products in clinical development, as well as other products the parties may agree upon in the future. There are risks inherent in pharmaceutical manufacturing that could affect the ability of our CMOs, including Agilent, to meet our delivery time requirements or provide adequate amounts of material to meet our needs. Included in these risks are potential synthesis and purification failures and/or contamination during the manufacturing process, as well as other issues with the CMO's facility and ability to comply with the applicable manufacturing requirements, which could result in unusable product and cause delays in our manufacturing timelines and ultimately delay our clinical trials, as well as result in additional expense to us. To fulfill our siRNA requirements, we will likely need to secure alternative suppliers of synthetic siRNAs and such alternative suppliers are limited and may not be readily available, or we may be unable to enter into agreements with them on reasonable terms and in a timely manner. As noted above, in order to ensure long-term supply capabilities for our RNAi therapeutics, we are developing our own capabilities to manufacture drug substance, including siRNAs and siRNA conjugates, for clinical and commercial use.

In addition to the manufacture of the synthetic siRNAs, we may have additional manufacturing requirements related to the technology required t o deliver the siRNA to the relevant cell or tissue type, such as lipid nanoparticles or conjugates. In some cases, the delivery technology we utilize is highly specialized or proprietary, and for technical and/or legal reasons, we may have access to only o ne or a limited number of potential manufacturers for such delivery technology. In addition, the scale-up of our delivery technologies could be very difficult and/or take significant time. We also have very limited experience in such scale-up and manufactu ring, requiring us to depend on a limited number of third parties, who might not be able to deliver in a timely manner, or at all. Failure by manufacturers to properly manufacture our delivery technology and/or formulate our siRNAs for delivery could resul t in unusable product. Furthermore, competition for supply from our manufacturers from other companies, a breach by such manufacturers of their contractual obligations or a dispute with such manufacturers would cause delays in our discovery and development efforts, as well as additional expense to us.

Given the limited number of suppliers for our delivery technology and drug substance, we have developed cGMP capabilities and processes for the manufacture of patisiran formulated bulk drug product for late stage clinical use and commercial supply. During 2015, we scaled our cGMP manufacturing capacity for patisiran and believe we should have adequate resources to supply our commercial needs. In addition, as noted above, we are developing our own capabilities to manufacture drug substance, including siRNAs and siRNA conjugates, for clinical and commercial use. In developing these manufacturing capabilities by building our own manufacturing facilities, we have incurred substantial expenditures, and expect to incur significant additional expenditures in the future. In addition, the construction and qualification of our drug substance facility is expected to take several years to complete and there are many risks inherent in the construction of a new facility that could result in delays and additional costs, including the need to obtain access to necessary equipment and third-party technology, if any. Also, we have had to, and will likely need to continue to, hire and train qualified employees to staff our facilities. We do not currently have a second source of supply for patisiran formulated bulk drug product. If we are unable to manufacture sufficient quantities of material or if we encounter problems with our facilities in the future, we may also need to secure alternative suppliers of patisiran formulated bulk drug product and drug substance, and such alternative suppliers may not be available, or we may be unable to enter into agreements with them on reasonable terms and in a timely manner.

The manufacturing process for any products that we may develop is subject to the FDA and foreign regulatory authority approval process and we will need to meet, and will need to contract with CMOs who can meet, all applicable FDA and foreign regulatory authority requirements on an ongoing basis. In addition, if we receive the necessary regulatory approval for any product candidate, we also expect to rely on third parties, including potentially our commercial collaborators, to produce materials required for commercial supply. We may experience difficulty in obtaining adequate manufacturing capacity for our needs and the needs of our collaborators, who we have, in some instances, the obligation to supply. If we are unable to obtain or maintain CMOs for these product candidates, or to do so on commercially reasonable terms, we may not be able to successfully develop and commercialize our products.

To the extent that we have existing, or enter into future, manufacturing arrangements with third parties, we depend, and will depend in the future, on these third parties, including Agilent, to perform their obligations in a timely manner and consistent with contractual and regulatory requirements, including those related to quality control and quality assurance. The failure of Agilent or any other CMO to perform its obligations as expected, or, to the extent we manufacture all or a portion of our product candidates ourselves, our failure to execute on our manufacturing requirements, could adversely affect our business in a number of ways, including:

- we or our current or future collaborators may not be able to initiate or continue clinical trials of product candidates that are under development;
- we or our current or future collaborators may be delayed in submitting regulatory applications, or receiving regulatory approvals, for our product candidates;
- we may lose the cooperation of our collaborators;
- our facilities and those of our CMOs, and our products could be the subject of inspections by regulatory authorities that could have a negative outcome and result in delays in supply;
- we may be required to cease distribution or recall some or all batches of our products or take action to recover clinical trial material from clinical trial sites; and
- ultimately, we may not be able to meet commercial demands for our products.

If any CMO with whom we contract, including Agilent, fails to perform its obligations, we may be forced to manufacture the materials ourselves, for which we may not have the capabilities or resources, or enter into an agreement with a different CMO, which we may not be able to do on reasonable terms, if at all. In either scenario, our clinical trials or commercial distribution could be delayed significantly as we establish alternative supply sources. In some cases, the technical skills required to manufacture our

products or product candidates may be unique or proprietary to the original CMO and we may have difficulty, or there ma y be contractual restrictions prohibiting us from, transferring such skills to a back-up or alternate supplier, or we may be unable to transfer such skills at all. In addition, if we are required to change CMOs for any reason, we will be required to verify that the new CMO maintains facilities and procedures that comply with quality standards and with all applicable regulations and guidelines. We will also need to verify, such as through a manufacturing comparability study, that any new manufacturing proces s will produce our product according to the specifications previously submitted to or approved by the FDA or another regulatory authority. The delays associated with the verification of a new CMO could negatively affect our ability to develop product candi dates in a timely manner or within budget. Furthermore, a CMO may possess technology related to the manufacture of our product candidate that such CMO owns independently. This would increase our reliance on such CMO or require us to obtain a license from s uch CMO in order to have another CMO manufacture our products or product candidates.

We have no sales or distribution experience and only early capabilities for marketing, sales and market access, and expect to invest significant financial and management resources to establish these capabilities and to establish infrastructure in the EU.

We have no sales or distribution experience and only early capabilities for marketing, sales and market access. We currently expect to rely heavily on third parties to launch and market certain of our product candidates in certain geographies, if approved. However, we intend to commercialize the majority of our products on our own in the United States, Canada and the EU, as well as globally in the case of givosiran. Accordingly, we will need to develop internal sales, distribution and marketing capabilities as part of our core product strategy initially in the United States, Canada and the EU, and longer-term on a global basis, which will require significant financial and management resources. For the majority of our Genetic Medicine programs where we will perform sales, marketing and distribution functions ourselves in the United States, Canada and Western Europe, and for future Cardio-Metabolic and Hepatic Infectious Disease products we successfully develop where we may retain certain product development and commercialization rights, we could face a number of additional risks, including:

- we may not be able to attract and build a significant marketing or sales force;
- we may not be able to establish our capabilities and infrastructure in the EU or in other territories in a timely manner;
- the cost of establishing a marketing or sales force may not be justifiable in light of the revenues generated by any particular product; and
- our direct sales and marketing efforts may not be successful.

If we are unable to develop our own sales, marketing and distribution capabilities in the United States, Canada and the EU, as well as globally for certain products, we will not be able to successfully commercialize our products in our sales territories without reliance on third parties.

Credit and financial market conditions may exacerbate certain risks affecting our business from time to time.

Due to tightening of global credit, there may be a disruption or delay in the performance of our third-party contractors, suppliers or collaborators. We rely on third parties for several important aspects of our business, including significant portions of our manufacturing needs, development of product candidates and conduct of clinical trials. If such third parties are unable to satisfy their commitments to us, our business could be adversely affected.

Our ability to secure additional financing in addition to our term loan agreements and to satisfy our financial obligations under indebtedness outstanding from time to time will depend upon our future operating performance, which is subject to then prevailing general economic and credit market conditions, including interest rate levels and the availability of credit generally, and financial, business and other factors, many of which are beyond our control. In light of periodic uncertainty in the capital and credit markets, there can be no assurance that sufficient financing will be available on desirable or even any terms to fund investments, acquisitions, stock repurchases, dividends, debt refinancing or extraordinary actions.

Risks Related to Managing Our Operations

If we are unable to attract and retain qualified key management and scientists, development and commercial staff, consultants and advisors, our ability to implement our business plan may be adversely affected.

We are highly dependent upon our senior management and our scientific, clinical and medical staff. The loss of the service of any of the members of our senior management, including Dr. John Maraganore, our Chief Executive Officer, may significantly delay or prevent the achievement of product development and other business objectives. Our employment arrangements with our key personnel are terminable without notice. We do not carry key person life insurance on any of our employees.

We have grown our workforce significantly over the past year and anticipate continuing to add a significant number of additional employees as we focus on ach ieving our *Alnylam 2020* strategy. We face intense competition for qualified individuals from numerous pharmaceutical and biotechnology companies, universities, governmental entities and other research institutions, many of which have substantially greater resources with which to reward qualified individuals than we do. In addition, due to the risks associated with developing a new class of medicine, we may experience disappointing results in a clinical program and our stock price may decline as a result, as was the case following our decision in October 2016 to discontinue our revusiran program. As a result, we may face additional challenges in attracting and retaining employees. Accordingly, we may be unable to attract and retain suitably qualified individ uals in order to support our growing research, development and commercialization efforts and initiatives, and our failure to do so could have an adverse effect on our ability to implement our future business plan.

We may have difficulty expanding our operations successfully as we evolve from a U.S.-based company primarily involved in discovery, pre-clinical testing and clinical development into a global company that develops and commercializes multiple drugs.

We expect that as we increase the number of product candidates we are developing we will also need to expand our operations in the United States and continue to build operations in the EU and eventually other geographies. As noted above, we grew our workforce significantly during 2016 and during the first six months of 2017 and anticipate continuing to hire additional employees, including employees in the EU, as we focus on achieving our *Alnylam 2020* strategy. This expected growth is placing a strain on our administrative and operational infrastructure, and we will need to develop additional and/or new infrastructure and capabilities to support our growth and obtain additional space to conduct our operations in the United States, the EU and other geographies. If we are unable to develop such additional infrastructure or obtain sufficient space to accommodate our growth in a timely manner and on commercially reasonable terms, our business could be negatively impacted. As product candidates we develop enter and advance through clinical trials, we will need to expand our development, regulatory, manufacturing, quality, compliance, and marketing and sales capabilities in the United States and the EU, as well as other geographies, or contract with other organizations to provide these capabilities for us. In addition, as our operations expand due to our development progress, we expect that we will need to manage additional relationships with various collaborators, suppliers and other organizations. Our ability to manage our operations and future growth will require us to continue to improve our operational, financial and management controls and systems, reporting systems and infrastructure, and policies and procedures. We may not be able to implement improvements to our management information and control systems in an efficient or timely manner and may discover deficiencies in existing systems and controls.

The increasing use of social media platforms presents new risks and challenges.

Social media is increasingly being used to communicate about our clinical development programs and the diseases our investigational RNAi therapeutics are being developed to treat. Social media practices in the biopharmaceutical industry continue to evolve and regulations relating to such use are not always clear. This evolution creates uncertainty and risk of noncompliance with regulations applicable to our business. For example, patients may use social media channels to comment on their experience in an ongoing blinded clinical study or to report an alleged adverse event. When such disclosures occur, there is a risk that we fail to monitor and comply with applicable adverse event reporting obligations or we may not be able to defend the company or the public's legitimate interests in the face of the political and market pressures generated by social media due to restrictions on what we may say about our investigational products. There is also a risk of inappropriate disclosure of sensitive information or negative or inaccurate posts or comments about us on any social networking website. If any of these events were to occur or we otherwise fail to comply with applicable regulations, we could incur liability, face regulatory actions or incur other harm to our business.

Our business and operations could suffer in the event of system failures.

Despite the implementation of security measures, our internal computer systems and those of our contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war, and telecommunication and electrical failures. Such events could cause interruption of our operations. For example, the loss of pre-clinical trial data or data from completed or ongoing clinical trials for our product candidates could result in delays in our regulatory filings and development efforts, as well as delays in the commercialization of our products, and significantly increase our costs. To the extent that any disruption or security breach were to result in a loss of or damage to our data, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the development and potential commercialization of our product candidates could be delayed.

The results of the United Kingdom's referendum on withdrawal from the EU may have a negative effect on global economic conditions, financial markets and our business.

In June 2016, the United Kingdom, or UK, held a referendum in which voters approved an exit from the EU, commonly referred to as "Brexit." This referendum has created political and economic uncertainty, particularly in the UK and the EU, and this uncertainty may persist for years. A withdrawal could, among other outcomes, disrupt the free movement of goods, services and people between the UK and the EU, and result in increased legal and regulatory complexities, as well as potential higher costs of conducting business in Europe. The UK's vote to exit the EU could also result in similar referendums or votes in other European countries in which we do business. Given the lack of comparable precedent, it is unclear what financial, trade and legal implications the withdrawal of the UK from the EU would have and how such withdrawal would affect us.

For example, Brexit could result in the UK or the EU significantly altering its regulations af fecting the clearance or approval of our product candidates that are developed in the UK. Any new regulations could add time and expense to the conduct of our business, as well as the process by which our products receive regulatory approval in the UK, the EU and elsewhere. In addition, the announcement of Brexit and the withdrawal of the UK from the EU have had and may continue to have a material adverse effect on global economic conditions and the stability of global financial markets, and may significant ly reduce global market liquidity and restrict the ability of key market participants to operate in certain financial markets. Any of these effects of Brexit, among others, could adversely affect our business, our results of operations, liquidity and finan cial condition.

Risks Related to Our Industry

Risks Related to Development, Clinical Testing and Regulatory Approval of Our Product Candidates

Any product candidates we develop may fail in development or be delayed to a point where they do not become commercially viable.

Before obtaining regulatory approval for the commercial distribution of our product candidates, we must conduct, at our own expense, extensive nonclinical tests and clinical trials to demonstrate the safety and efficacy in humans of our product candidates. Nonclinical and clinical testing is expensive, difficult to design and implement, can take many years to complete and is uncertain as to outcome, and the historical failure rate for product candidates is high. In October 2016, we discontinued development of one of our product candidates, which included a Phase 3 clinical trial. We currently have multiple other programs in clinical development, including two programs in Phase 3 development, as well as several earlier stage clinical programs. However, we may not be able to further advance these or any other product candidate through clinical trials and regulatory approval.

If we enter into clinical trials, the results from nonclinical testing or early clinical trials of a product candidate may not predict the results that will be obtained in subsequent subjects or in subsequent human clinical trials of that product candidate or any other product candidate. For example, in June 2017, we announced updated results from our Phase 1 clinical trial of givosiran. Although the clinical data from this trial are encouraging, the data are preliminary in nature, based on a limited number of patients with acute intermittent porphyria, or AIP, and the givosiran Phase 1 study is not complete. These data, or other positive data, may not continue for patients with AIP or occur for any future patients in this study, and may not be repeated or observed in any future studies. There can be no assurance that our studies with givosiran will ultimately be successful or support further clinical advancement or regulatory approval of this product candidate. There is a high failure rate for drugs proceeding through clinical studies. A number of companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in clinical development even after achieving promising results in earlier studies, and any such setbacks in our clinical development could have a material adverse effect on our business and operating results. Moreover, patisiran, fitusiran and our other product candidates each employ novel delivery technologies that have yet to be extensively evaluated in human clinical trials and proven safe and effective.

In addition, we, the FDA or other applicable regulatory authorities, or an institutional review board, or IRB, or similar foreign review board or committee, may delay initiation of or suspend clinical trials of a product candidate at any time for various reasons, including if we or they believe the healthy volunteer subjects or patients participating in such trials are being exposed to unacceptable health risks. Among other reasons, adverse side effects of a product candidate or related product on healthy volunteer subjects or patients in a clinical trial could result in our decision, or a decision by the FDA or foreign regulatory authorities, to suspend or terminate the trial, or, in the case of regulatory agencies, a refusal to approve a particular product candidate for any or all indications of use. For example, in October 2016, we announced our decision to discontinue development of revusiran, an investigational RNAi therapeutic that was being developed for the treatment of patients with cardiomyopathy due to hATTR amyloidosis. Our decision followed the recommendation of the revusiran ENDEAVOUR Phase 3 study Data Monitoring Committee, or DMC, to suspend dosing and the observation of an imbalance in mortality in revusiran-treated patients as compared to those on placebo. Separately, the patisiran APOLLO DMC met at our request following our decision to discontinue development of revusiran, and recommended continuation of the APOLLO Phase 3 trial of patisiran, without modification. We conducted a comprehensive evaluation of the revusiran data and reported the results of our evaluation on August 9, 2017. Following our evaluation, we continue to believe that the decision to discontinue development of revusiran does not affect patisiran, which is in development for the treatment of hATTR amyloidosis, or any of our other investigational RNAi therapeutic programs in development.

Clinical trials of a new product candidate require the enrollment of a sufficient number of patients, including patients who are suffering from the disease the product candidate is intended to treat and who meet other eligibility criteria. Rates of patient enrollment are affected by many factors, including the size of the patient population, the age and condition of the patients, the stage and severity of disease, the availability of clinical trials for other investigational drugs for the same disease or condition, the nature of the protocol, the proximity of patients to clinical sites, the availability of effective treatments for the relevant disease, and the eligibility criteria for the clinical trial. For example, we may experience difficulty enrolling our clinical trials, including, but not limited to, our clinical trials for fitusiran, due to the availability of existing approved treatments, as well as other investigational treatments in development. Delays or difficulties in patient enrollment or difficulties retaining trial participants, including as a result of the availability of existing or other investigational treatments, can result in increased costs, longer development times or termination of a clinical trial.

Although our investigational RNAi therapeutics have been generally well tolerated in our clinical trials to date, new safety findings may emerge. For example, as noted above , in October 2016, we made the decision to discontinue our revusiran program. Following reports in the revusiran Phase 2 OLE study of new onset or worsening peripheral neuropathy, the revusiran ENDEAVOUR Phase 3 study DMC assembled in early October 2016 at our request to review these reports and ENDEAVOUR safety data on an unblinded basis. The DMC did not find conclusive evidence for a drug-related neuropathy signal in the ENDEAVOUR trial, but informed us that the benefit-risk profile for revusiran no longe r supported continued dosing. We subsequently reviewed unblinded ENDEAVOUR data which revealed an imbalance of mortality in the revusiran arm as compared to placebo. Further, a review by us in 2017 of the ENDEAVOUR results subsequent to the completion of f ollow-up of the patients post-dosing discontinuation revealed an imbalance in new onset or worsening peripheral neuropathy in the revusiran arm as compared to placebo. We had previously reported, in July 2016, preliminary data from our revusiran Phase 2 OL E study for 12 patients who had reached the 12-month endpoint as of the data transfer date of May 26, 2016. Serious adverse events, or SAEs, were observed in 14 patients, one of which, a case of lactic acidosis, was deemed possibly related to the study dru g and the patient discontinued treatment. There were a total of seven deaths reported at that time in the revusiran OLE study, all of which were unrelated to study drug. The majority of the adverse events, or AEs, were mild or moderate in severity; inject ion site reactions, or ISRs, were reported in 12 patients. In August 2015, we reported that three patients had discontinued from the revusiran Phase 2 OLE study due to recurrent localized reactions at the injection site or a diffuse rash; no further discon tinuations due to ISRs had occurred as of May 26, 2016. In our patisiran Phase 2 OLE study in patients with polyneuropathy due to hATTR amyloidosis, based on final 24-month data reported from 27 patients reported in April 2017, the most common drug-related or possibly drug-related AEs were flushing and infusion-related reactions, all of which were all mild in severity and did not result in any discontinuations. There were ten reports of SAEs in seven patients, all of which were unrelated to study drug, incl uding one discontinuation for gastroesophageal cancer at approximately 20 months in a patient who subsequently died and one death due to myocardial infarction in a 79 year-old patient who died after having completed the full 24 months of treatment. As note d above, t he patisiran APOLLO Phase 3 study DMC met at our request following our decision to discontinue development of revusiran, and recommended continuation of the APOLLO Phase 3 trial without modification. In addition, in our ALN-VSP clinical trial, on e patient with advanced pancreatic neuroendocrine cancer with extensive involvement of the liver developed hepatic failure five days following the second dose of ALN-VSP and subsequently died; this was deemed possibly related to the study drug. As demonstr ated by the discontinuation of our revusiran program in October 2016, the occurrence of AEs can result in the suspension or termination of clinical trials of a product candidate by us or the FDA or a foreign regulatory authority, or refusal to approve a pa rticular product candidate for any or all indications of use.

Clinical trials also require the review, oversight and approval of IRBs or, outside of the United States, an independent ethics committee, which continually review clinical investigations and protect the rights and welfare of human subjects. Inability to obtain or delay in obtaining IRB or ethics committee approval can prevent or delay the initiation and completion of clinical trials, and the FDA or foreign regulatory authorities may decide not to consider any data or information derived from a clinical investigation not subject to initial and continuing IRB or ethics committee review and approval, as the case may be, in support of a marketing application.

Our product candidates that we develop may encounter problems during clinical trials that will cause us, an IRB, ethics committee or regulatory authorities to delay, suspend or terminate these trials, or that will delay or confound the analysis of data from these trials. If we experience any such problems, we may not have the financial resources to continue development of the product candidate that is affected, or development of any of our other product candidates. We may also lose, or be unable to enter into, collaborative arrangements for the affected product candidate and for other product candidates we are developing.

A failure of one or more of our clinical trials can occur at any stage of testing. We may experience numerous unforeseen events during, or as a result of, nonclinical testing and the clinical trial process that could delay or prevent regulatory approval or our ability to commercialize our product candidates, including:

- our nonclinical tests or clinical trials may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional nonclinical testing or clinical trials, or we may abandon projects that we expect to be promising;
- delays in filing investigational new drug, or IND, applications or comparable foreign applications or delays or failure in obtaining the necessary approvals from regulators or IRBs/ethics committees in order to commence a clinical trial at a prospective trial site, or their suspension or termination of a clinical trial once commenced;
- conditions imposed on us by an IRB or ethics committee, or the FDA or comparable foreign authorities regarding the scope or design of our clinical trials;
- problems in engaging IRBs or ethics committees to oversee clinical trials or problems in obtaining or maintaining IRB or ethics committee approval of trials;
- delays in enrolling patients and volunteers into clinical trials, and variability in the number and types of patients and volunteers available for clinical trials;

- high drop-out rates for patients and volunteers in clinic al trials;
- negative or inconclusive results from our clinical trials or the clinical trials of others for product candidates similar to ours;
- inadequate supply or quality of product candidate materials or other materials necessary for the conduct of our clinical trials;
- greater than anticipated clinical trial costs;
- serious and unexpected drug-related side effects experienced by participants in our clinical trials or by individuals using drugs similar to our product candidates;
- poor or disappointing effectiveness of our product candidates during clinical trials;
- unfavorable FDA or other regulatory agency inspection and review of a clinical trial site or records of any clinical or nonclinical investigation;
- failure of our third-party contractors or investigators to comply with regulatory requirements or otherwise meet their contractual obligations in a timely manner, or at all;
- governmental or regulatory delays and changes in regulatory requirements, policy and guidelines, including the imposition of additional regulatory oversight around clinical testing generally or with respect to our technology in particular; or
- varying interpretations of data by the FDA and similar foreign regulatory agencies.

Even if we successfully complete clinical trials of our product candidates, any given product candidate may not prove to be a safe and effective treatment for the disease for which it was being tested.

We may be unable to obtain United States or foreign regulatory approval and, as a result, unable to commercialize our product candidates.

Our product candidates are subject to extensive governmental regulations relating to, among other things, research, testing, development, manufacturing, safety, efficacy, approval, recordkeeping, reporting, labeling, storage, packaging, advertising and promotion, pricing, marketing and distribution of drugs. Rigorous nonclinical testing and clinical trials and an extensive regulatory approval process are required to be successfully completed in the United States and in many foreign jurisdictions before a new drug can be marketed. Satisfaction of these and other regulatory requirements is costly, time consuming, uncertain and subject to unanticipated delays. It is possible that none of the product candidates we may develop will obtain the regulatory approvals necessary for us or our collaborators to begin selling them.

We have limited experience in conducting and managing the clinical trials necessary to obtain regulatory approvals, including approval by the FDA. The time required to obtain FDA and other regulatory approvals is unpredictable but typically takes many years following the commencement of clinical trials, depending upon the type, complexity and novelty of the product candidate. The standards that the FDA and its foreign counterparts use when regulating us are not always applied predictably or uniformly and can change. Any analysis we perform of data from nonclinical and clinical activities is subject to confirmation and interpretation by regulatory authorities, which could delay, limit or prevent regulatory approval. We may also encounter unexpected delays or increased costs due to new government regulations, for example, from future legislation or administrative action, or from changes in FDA policy during the period of product development, clinical trials and FDA regulatory review. It is impossible to predict whether legislative changes will be enacted, or whether FDA or foreign regulations, guidance or interpretations will be changed, or what the impact of such changes, if any, may be.

Because the drugs we are developing may represent a new class of drug, the FDA and its foreign counterparts have not yet established any definitive policies, practices or guidelines in relation to these drugs. The lack of policies, practices or guidelines may hinder or slow review by the FDA of any regulatory filings that we may submit. Moreover, the FDA may respond to these submissions by defining requirements we may not have anticipated. Such responses could lead to significant delays in the clinical development of our product candidates. In addition, because there may be approved treatments for some of the diseases for which we may seek approval, in order to receive regulatory approval, we may need to demonstrate through clinical trials that the product candidates we develop to treat these diseases, if any, are not only safe and effective, but safer or more effective than existing products. Furthermore, in recent years, there has been increased public and political pressure on the FDA with respect to the approval process for new drugs, and the FDA’s standards, especially regarding drug safety, appear to have become more stringent.

Assuming the data from our APOLLO Phase 3 clinical trial is positive, we expect to file our first NDA and MAA for patisiran at the end of 2017. Any delay or failure in obtaining required approvals could have a material adverse effect on our ability to generate revenues from patisiran or any product candidate for which we may seek app roval in the future. Furthermore, any regulatory approval to market patisiran or any other product may be subject to limitations on the approved uses for which we may market the product or the labeling or other restrictions. In addition, the FDA has the au thority to require a Risk Evaluation and Mitigation Strategy, or REMS, plan as part of an NDA, or after approval, which may impose further requirements or restrictions on the distribution or use of an approved drug, such as limiting prescribing to certain physicians or medical centers that have undergone specialized training, limiting treatment to patients who meet certain safe-use criteria and requiring treated patients to enroll in a registry. In the EU, we could be required to adopt a similar plan, known as a risk management plan, and our products could be subject to specific risk minimization measures, such as restrictions on prescription and supply, the conduct of post-marketing safety or efficacy studies, or the distribution of patient and/or prescribe r educational materials. In either instance, these limitations and restrictions may limit the size of the market for the product and affect reimbursement by third-party payors.

We are also subject to numerous foreign regulatory requirements governing, among other things, the conduct of clinical trials, manufacturing and marketing authorization, pricing and third-party reimbursement. The foreign regulatory approval process varies among countries and includes all of the risks associated with FDA approval described above as well as risks attributable to the satisfaction of local regulations in foreign jurisdictions. Approval by the FDA does not ensure approval by regulatory authorities outside the United States and vice versa.

Even if we obtain regulatory approvals, our marketed drugs will be subject to ongoing regulatory oversight. If we fail to comply with continuing U.S. and foreign requirements, our approvals could be limited or withdrawn, we could be subject to other penalties, and our business would be seriously harmed.

Following any initial regulatory approval of any drugs we may develop, we will also be subject to continuing regulatory oversight, including the review of adverse drug experiences and clinical results that are reported after our drug products are made commercially available. This would include results from any post-marketing tests or surveillance to monitor the safety and efficacy of the drug product required as a condition of approval or agreed to by us. Any regulatory approvals that we receive for our product candidates may also be subject to limitations on the approved uses for which the product may be marketed. Other ongoing regulatory requirements include, among other things, submissions of safety and other post-marketing information and reports, registration and listing, as well as continued compliance with cGMP requirements and GCP requirements for any clinical trials that we conduct post-approval. In addition, we are conducting, and intend to continue to conduct, clinical trials for our product candidates, and we intend to seek approval to market our product candidates, in jurisdictions outside of the United States, and therefore will be subject to, and must comply with, regulatory requirements in those jurisdictions.

The FDA has significant post-market authority, including, for example, the authority to require labeling changes based on new safety information and to require post-market studies or clinical trials to evaluate serious safety risks related to the use of a drug and to require withdrawal of the product from the market. The FDA also has the authority to require a REMS plan after approval, which may impose further requirements or restrictions on the distribution or use of an approved drug.

The CMO and manufacturing facilities we use to make our product candidates, including our Cambridge facility, our future Norton facility, and Agilent and other CMOs, will also be subject to periodic review and inspection by the FDA and other regulatory agencies. To date, our Cambridge manufacturing facility has not been subject to an inspection by any regulatory authority. The discovery of any new or previously unknown problems with us or our CMOs, or our or their manufacturing processes or facilities, may result in restrictions on the drug or CMO or facility, including withdrawal of the drug from the market. We have developed cGMP capabilities and processes for the manufacture of patisiran formulated bulk drug product for Phase 3 clinical and commercial use. In addition, in April 2016, we completed our purchase of a parcel of land in Norton, Massachusetts, where we have commenced construction of a cGMP manufacturing facility for drug substance, including siRNAs and siRNA conjugates, for clinical and commercial use. We may not have the ability or capacity to manufacture material at a broader commercial scale in the future. We may manufacture clinical trial materials or we may contract a third party to manufacture these materials for us. Reliance on CMOs entails risks to which we would not be subject if we manufactured products ourselves, including reliance on the CMO for regulatory compliance. Our product promotion and advertising will also be subject to regulatory requirements and continuing regulatory review.

If we or our collaborators, CMOs or service providers fail to comply with applicable continuing regulatory requirements in the United States or foreign jurisdictions in which we may seek to market our products, we or they may be subject to, among other things, fines, warning letters, holds on clinical trials, refusal by the FDA or foreign regulatory authorities to approve pending applications or supplements to approved applications, suspension or withdrawal of regulatory approval, product recalls and seizures, refusal to permit the import or export of products, operating restrictions, injunction, civil penalties and criminal prosecution.

Even if we receive regulatory approval to market our product candidates, the market may not be receptive to our product candidates upon their commercial introduction, which will prevent us from becoming profitable.

The product candidates that we are developing are based upon new technologies or therapeutic approaches. Key participants in pharmaceutical marketplaces, such as physicians, third-party payors and consumers, may not accept a product intended to improve therapeutic results based on RNAi technology. As a result, it may be more difficult for us to convince the medical community and third-party payors to accept and use our product, or to provide favorable reimbursement.

Other factors that we believe will materially affect market acceptance of our product candidates include:

- the timing of our receipt of any marketing approvals, the terms of any approvals and the countries in which approvals are obtained;
- the safety and efficacy of our product candidates, as demonstrated in clinical trials and as compared with alternative treatments, if any;
- relative convenience and ease of administration of our product candidates;
- the willingness of patients to accept potentially new routes of administration or new or different therapeutic approaches and mechanisms of action;
- the success of our physician education programs;
- the availability of adequate government and third-party payor reimbursement;
- the pricing of our products, particularly as compared to alternative treatments; and
- availability of alternative effective treatments for the diseases that product candidates we develop are intended to treat and the relative risks, benefits and costs of those treatments.

For example, patisiran utilizes an intravenous mode of administration that physicians and/or patients may not readily adopt or which may not compete with other potentially available options. In addition, fitusiran represents a new approach to treating hemophilia which may not be readily accepted by patients and their caregivers.

In addition, our estimates regarding the potential market size may be materially different from what we currently expect at the time we commence commercialization, which could result in significant changes in our business plan and may have a material adverse effect on our results of operations and financial condition.

If we or our collaborators, CMOs or service providers fail to comply with healthcare laws and regulations, we or they could be subject to enforcement actions, which could affect our ability to develop, market and sell our products and may harm our reputation.

As a manufacturer of pharmaceuticals, we are subject to federal, state, and comparable foreign healthcare laws and regulations pertaining to fraud and abuse and patients' rights. These laws and regulations include:

- the U.S. federal Anti-Kickback statute, which prohibits, among other things, persons from soliciting, receiving, offering or paying remuneration, directly or indirectly, to induce either the referral of an individual for a healthcare item or service, or the purchasing or ordering of an item or service, for which payment may be made under a federal healthcare program such as Medicare or Medicaid;
- the U.S. federal false claims laws, which prohibit, among other things, individuals or entities from knowingly presenting or causing to be presented, claims for payment by government-funded programs such as Medicare or Medicaid that are false or fraudulent, and which may apply to us by virtue of statements and representations made to customers or third parties;
- the U.S. federal Health Insurance Portability and Accountability Act and Health Information Technology for Economic and Clinical Health Act, which impose requirements relating to the privacy, security, and transmission of individually identifiable health information; and require notification to affected individuals and regulatory authorities of certain breaches of security of individually identifiable health information;
- the U.S. federal Open Payments requirements were implemented by The Centers for Medicare and Medicaid Services, or CMS, pursuant to the Patient Protection and Affordable Care Act, also referred to as the Affordable Care Act or PPACA. Under the Open Payments Program, manufacturers of medical devices, medical supplies, biological products and drugs covered by Medicare, Medicaid and the Children's Health Insurance Programs report all transfers of value, including consulting fees, travel reimbursements, research grants, and other payments or gifts with values over $10 made to physicians and teaching hospitals; and

- state and foreign laws comparable to each of the above federal laws, including in the EU laws prohibiting giving healthcare professionals any gift or benefit in kind as an inducement to prescribe our products, national transparency laws requiring the public disclosure of payments made to healthcare professionals and institutions, and data priv acy laws, in addition to anti-kickback and false claims laws applicable to commercial insurers and other non-federal payors, requirements for mandatory corporate regulatory compliance programs, and laws relating to government reimbursement programs, patie nt data privacy and security.

If our operations are found to be in violation of any such requirements, we may be subject to penalties, including civil or criminal penalties, criminal prosecution, monetary damages, the curtailment or restructuring of our operations, loss of eligibility to obtain approvals from the FDA, or exclusion from participation in government contracting, healthcare reimbursement or other government programs, including Medicare and Medicaid, or the imposition of a corporate integrity agreement with the Office of Inspector General of the Department of Health and Human Services, any of which could adversely affect our financial results. Although effective compliance programs can mitigate the risk of investigation and prosecution for violations of these laws, these risks cannot be entirely eliminated. Any action against us for an alleged or suspected violation could cause us to incur significant legal expenses and could divert our management's attention from the operation of our business, even if our defense is successful. In addition, achieving and sustaining compliance with applicable laws and regulations may be costly to us in terms of money, time and resources.

If we or our collaborators, CMOs or service providers fail to comply with applicable federal, state or foreign laws or regulations, we could be subject to enforcement actions, which could affect our ability to develop, market and sell our products successfully and could harm our reputation and lead to reduced acceptance of our products by the market. These enforcement actions include, among others:

- adverse regulatory inspection findings;
- warning letters;
- voluntary or mandatory product recalls or public notification or medical product safety alerts to healthcare professionals;
- restrictions on, or prohibitions against, marketing our products;
- restrictions on, or prohibitions against, importation or exportation of our products;
- suspension of review or refusal to approve pending applications or supplements to approved applications;
- exclusion from participation in government-funded healthcare programs;
- exclusion from eligibility for the award of government contracts for our products;
- suspension or withdrawal of product approvals;
- product seizures;
- injunctions; and
- civil and criminal penalties, up to and including criminal prosecution resulting in fines, exclusion from healthcare reimbursement programs and imprisonment.

Moreover, federal, state or foreign laws or regulations are subject to change, and while we, our collaborators, CMOs and/or service providers currently may be compliant, that could change due to changes in interpretation, prevailing industry standards or the legal structure.

Any drugs we develop may become subject to unfavorable pricing regulations, third-party reimbursement practices or healthcare reform initiatives, thereby harming our business.

The regulations that govern marketing approvals, pricing and reimbursement for new drugs vary widely from country to country. Some countries require approval of the sale price of a drug before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. We are actively monitoring these regulations as several of our programs move into late stages of development, however, a number of our programs are currently in the earlier stages of development and we will not be able to assess the impact of price regulations for a number of years. As a result, we might obtain regulatory approval for a product in a particular country, but then be subject to price regulations that delay our commercial launch of the product and negatively impact the revenues we are able to generate from the sale of the product in that country and potentially in other countries due to reference pricing.

Our ability to commercialize any products successfully also will depend in part on the e xtent to which reimbursement for these products and related treatments will be available from government health administration authorities, private health insurers and other organizations. Even if we succeed in bringing one or more products to the market, these products may not be considered cost-effective, and the amount reimbursed for any products may be insufficient to allow us to sell our products on a competitive basis. Increasingly, the third-party payors who reimburse patients or healthcare providers , such as government and private insurance plans, are requiring that drug companies provide them with predetermined discounts from list prices, and are seeking to reduce the prices charged or the amounts reimbursed for drug products. If the price we are ab le to charge for any products we develop, or the reimbursement provided for such products, is inadequate in light of our development and other costs, or if reimbursement is denied, our return on investment could be adversely affected.

We currently expect that some of the drugs we develop may need to be administered under the supervision of a physician or other healthcare professional on an outpatient basis. Under currently applicable U.S. law, certain drugs that are not usually self-administered (including injectable drugs) may be eligible for coverage under the Medicare Part B program if:

- they are incident to a physician's services;
- they are reasonable and necessary for the diagnosis or treatment of the illness or injury for which they are administered according to accepted standards of medical practice; and
- they have been approved by the FDA and meet other requirements of the statute.

There may be significant delays in obtaining coverage for newly-approved drugs, and coverage may be more limited than the purposes for which the drug is approved by the FDA or foreign regulatory authorities. Moreover, eligibility for coverage does not imply that any drug will be reimbursed in all cases or at a rate that covers our costs, including research, development, manufacture, sale and distribution or that covers a particular provider's cost of acquiring the drug. Interim payments for new drugs, if applicable, may also not be sufficient to cover our costs and may not be made permanent. Reimbursement may be based on payments allowed for lower-cost drugs that are already reimbursed, may be incorporated into existing payments for other services and may reflect budgetary constraints or imperfections in Medicare data. Net prices for drugs may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of drugs from countries where they may be sold at lower prices than in the United States. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement rates. Our inability to promptly obtain coverage and adequate reimbursement rates from both government-funded and private payors for new drugs that we develop and for which we obtain regulatory approval could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize products, and our overall financial condition.

We believe that the efforts of governments and third-party payors to contain or reduce the cost of healthcare and legislative and regulatory proposals to broaden the availability of healthcare will continue to affect the business and financial condition of pharmaceutical and biopharmaceutical companies. A number of legislative and regulatory changes in the healthcare system in the United States and other major healthcare markets have been proposed in recent years, and such efforts have expanded substantially in recent years. These developments have included prescription drug benefit legislation that was enacted in 2003 and took effect in January 2006, healthcare reform legislation enacted by certain states, and major healthcare reform legislation that was passed by Congress and enacted into law in the United States in 2010. These developments could, directly or indirectly, affect our ability to sell our products, if approved, at a favorable price.

In particular, in March 2010, the PPACA was signed into law. This legislation changed the system of healthcare insurance and benefits intended to broaden coverage and control costs. The law also contains provisions that affect companies in the pharmaceutical industry and other healthcare related industries by imposing additional costs and changes to business practices. Provisions affecting pharmaceutical companies include the following:

- Mandatory rebates for drugs sold into the Medicaid program were increased, and the rebate requirement was extended to drugs used in risk-based Medicaid managed care plans.
- The 340B Drug Pricing Program under the Public Health Service Act was extended to require mandatory discounts for drug products sold to certain critical access hospitals, cancer hospitals and other covered entities.
- Pharmaceutical companies are required to offer discounts on brand-name drugs to patients who fall within the Medicare Part D coverage gap, commonly referred to as the "donut hole."
- Pharmaceutical companies are required to pay an annual non-tax deductible fee to the federal government based on each company's market share of prior year total sales of branded products to certain federal healthcare programs, such as Medicare, Medicaid, Department of Veterans Affairs and Department of Defense. Since we expect our branded pharmaceutical sales to constitute a small portion of the total federal healthcare program pharmaceutical market, we do not expect this annual assessment to have a material impact on our financial condition.

- The law provides that approval of an application for a follow-on biologic product may not become effective until 12 years after the date on which the reference innovator biologic product was first licensed by the F DA, with a possible six-month extension for pediatric products. After this exclusivity ends, it will be easier for generic manufacturers to enter the market, which is likely to reduce the pricing for such products and could affect our profitability.

The full effects of the U.S. healthcare reform legislation cannot be known until the law is fully implemented through regulations or guidance issued by the CMS and other federal and state healthcare agencies. The financial impact of the U.S. healthcare reform legislation over the next few years will depend on a number of factors, including, but not limited, to the policies reflected in implementing regulations and guidance, and changes in sales volumes for products affected by the new system of rebates, discounts and fees. This legislation may also have a positive impact on our future net sales, if any, by increasing the aggregate number of persons with healthcare coverage in the United States.

As a result of the 2016 election in the United States, there is great political uncertainty concerning the fate of the PPACA and other healthcare laws. Members of the United States Congress and the Trump Administration have expressed an intent to pass legislation to fundamentally change or repeal parts of the PPACA, but it is uncertain whether such legislation will be enacted or what the scope of any replacement law (if any) would encompass **.**

We cannot predict what healthcare reform initiatives may be adopted in the future. Further federal and state legislative and regulatory developments are likely, and we expect ongoing initiatives in the United States to increase pressure on drug pricing. Such reforms could have an adverse effect on anticipated revenues from product candidates that we may successfully develop and for which we may obtain regulatory approval and may affect our overall financial condition and ability to develop drug candidates.

Our ability to obtain services, reimbursement or funding from the federal government may be impacted by possible reductions in federal spending.

Under the Budget Control Act of 2011, the failure of Congress to enact deficit reduction measures of at least $1.2 trillion for the years 2013 through 2021 triggered automatic cuts to most federal programs. These cuts included aggregate reductions to Medicare payments to providers of up to 2 percent per fiscal year, starting in 2013. Certain of these automatic cuts have been implemented resulting in reductions in Medicare payments to physicians, hospitals, and other healthcare providers, among other things. The full impact on our business of these automatic cuts is uncertain.

If other federal spending is reduced, any budgetary shortfalls may also impact the ability of relevant agencies, such as the FDA or National Institutes of Health to continue to function. Amounts allocated to federal grants and contracts may be reduced or eliminated. These reductions may also impact the ability of relevant agencies to timely review and approve drug research and development, manufacturing, and marketing activities, which may delay our ability to develop, market and sell any products we may develop.

There is a substantial risk of product liability claims in our business. If we are unable to obtain sufficient insurance, a product liability claim against us could adversely affect our business.

Our business exposes us to significant potential product liability risks that are inherent in the development, testing, manufacturing and marketing of human therapeutic products. Product liability claims could delay or prevent completion of our clinical development programs. Following the decision to discontinue clinical development of revusiran, we conducted a comprehensive evaluation of available revusiran data. We reported the results of this evaluation on August 9, 2017. Notwithstanding the risks undertaken by all persons who participate in clinical trials, and the information on risks provided to study investigators and patients participating in revusiran studies, it is possible that product liability claims will be asserted against us relating to the worsening of a patient's condition alleged to have been caused by revusiran. Such claims might not be fully covered by product liability insurance. If we succeed in marketing products, product liability claims could result in an FDA investigation of the safety and effectiveness of our products, our manufacturing processes and facilities or our marketing programs, and potentially a recall of our products or more serious enforcement action, limitations on the approved indications for which they may be used, or suspension or withdrawal of approvals. Regardless of the merits or eventual outcome, liability claims may also result in decreased demand for our products, injury to our reputation, costs to defend the related litigation, a diversion of management's time and our resources, substantial monetary awards to trial participants or patients and a decline in our stock price. We currently have product liability insurance that we believe is appropriate for our stage of development and may need to obtain higher levels prior to marketing any of our product candidates. Any insurance we have or may obtain may not provide sufficient coverage against potential liabilities. Furthermore, clinical trial and product liability insurance is becoming increasingly expensive. As a result, we may be unable to obtain sufficient insurance at a reasonable cost to protect us against losses caused by product liability claims that could have a material adverse effect on our business.

If we do not comply with laws regulating the protection of the environment and health and human safety, ou r business could be adversely affected.

Our research, development and manufacturing involve the use of hazardous materials, chemicals and various radioactive compounds. We maintain quantities of various flammable and toxic chemicals in our facilities in Cambridge that are required for our research, development and manufacturing activities. We are subject to federal, state and local laws and regulations governing the use, manufacture, storage, handling and disposal of these hazardous materials. We believe our procedures for storing, handling and disposing these materials in our Cambridge facilities comply with the relevant guidelines of the City of Cambridge, the Commonwealth of Massachusetts and the Occupational Safety and Health Administration of the U.S. Department of Labor. Although we believe that our safety procedures for handling and disposing of these materials comply with the standards mandated by applicable regulations, the risk of accidental contamination or injury from these materials cannot be eliminated. If an accident occurs, we could be held liable for resulting damages, which could be substantial. We are also subject to numerous environmental, health and workplace safety laws and regulations, including those governing laboratory procedures, exposure to blood-borne pathogens and the handling of biohazardous materials.

Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of these materials, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological, hazardous or radioactive materials. Additional federal, state and local laws and regulations affecting our operations may be adopted in the future. We may incur substantial costs to comply with, and substantial fines or penalties if we violate, any of these laws or regulations.

Risks Related to Patents, Licenses and Trade Secrets

If we are not able to obtain and enforce patent protection for our discoveries, our ability to develop and commercialize our product candidates will be harmed.

Our success depends, in part, on our ability to protect proprietary methods and technologies that we develop under the patent and other intellectual property laws of the United States and other countries, so that we can prevent others from unlawfully using our inventions and proprietary information. However, we may not hold proprietary rights to some patents required for us to manufacture and commercialize our proposed products. Because certain U.S. patent applications are confidential until the patents issue, such as applications filed prior to November 29, 2000, or applications filed after such date which will not be filed in foreign countries, third parties may have filed patent applications for technology covered by our pending patent applications without our being aware of those applications, and our patent applications may not have priority over those applications. For this and other reasons, we may be unable to secure desired patent rights, thereby losing desired exclusivity. Further, we may be required to obtain licenses under third-party patents to market our proposed products or conduct our research and development or other activities. If licenses are not available to us on acceptable terms, we may not be able to market the affected products or conduct the desired activities.

Our strategy depends on our ability to rapidly identify and seek patent protection for our discoveries. In addition, we may rely on third-party collaborators to file patent applications relating to proprietary technology that we develop jointly during certain collaborations. The process of obtaining patent protection is expensive and time-consuming. If our present or future collaborators fail to file and prosecute all necessary and desirable patent applications at a reasonable cost and in a timely manner, our business may be adversely affected. Despite our efforts and the efforts of our collaborators to protect our proprietary rights, unauthorized parties may be able to obtain and use information that we regard as proprietary. While issued patents are presumed valid, this does not guarantee that the patent will survive a validity challenge or be held enforceable. Any patents we have obtained, or obtain in the future, may be challenged, invalidated, adjudged unenforceable or circumvented by parties attempting to design around our intellectual property. Moreover, third parties or the USPTO may commence interference proceedings involving our patents or patent applications. Any challenge to, finding of unenforceability or invalidation or circumvention of, our patents or patent applications, would be costly, would require significant time and attention of our management and could have a material adverse effect on our business.

Our pending patent applications may not result in issued patents. The patent position of pharmaceutical or biotechnology companies, including ours, is generally uncertain and involves complex legal and factual considerations. The standards that the USPTO and its foreign counterparts use to grant patents are not always applied predictably or uniformly and can change. Similarly, the ultimate degree of protection that will be afforded to biotechnology inventions, including ours, in the United States and foreign countries, remains uncertain and is dependent upon the scope of the protection decided upon by patent offices, courts and lawmakers. Moreover, there are periodic discussions in the Congress of the United States and in international jurisdictions about modifying various aspects of patent law. For example, the America Invents Act included a number of changes to the patent laws of the United States. If any of the enacted changes do not provide adequate protection for discoveries, including our ability to pursue infringers of our patents for substantial damages, our business could be adversely affected. One major provision of the America Invents Act, which took effect in March 2013, changed United States patent practice from a first-to-invent to a first-to-file system. If we fail to file an invention before a competitor files on the same invention, we no longer have the ability to provide proof that we were in possession of

the invention prior to the competitor's filing date, and thus would not be able to obtain patent protection for our invention. There is also no uniform, worldwide policy regard ing the subject matter and scope of claims granted or allowable in pharmaceutical or biotechnology patents.

Accordingly, we do not know the degree of future protection for our proprietary rights or the breadth of claims that will be allowed in any patents issued to us or to others. We also rely to a certain extent on trade secrets, know-how and technology, which are not protected by patents, to maintain our competitive position. If any trade secret, know-how or other technology not protected by a patent were to be disclosed to or independently developed by a competitor, our business and financial condition could be materially adversely affected.

We license patent rights from third-party owners. If such owners do not properly or successfully obtain, maintain or enforce the patents underlying such licenses, our competitive position and business prospects may be harmed.

We are a party to a number of licenses that give us rights to third-party intellectual property that is necessary or useful for our business. In particular, we have obtained licenses from, among others, Cancer Research Technology Limited, Ionis Pharmaceuticals, Inc., or Ionis (formerly Isis Pharmaceuticals, Inc.), the Massachusetts Institute of Technology, or MIT, the Whitehead Institute for Biomedical Research, or Whitehead, Max Planck Innovation and Arbutus. We also intend to enter into additional licenses to third-party intellectual property in the future.

Our success will depend in part on the ability of our licensors to obtain, maintain and enforce patent protection for our licensed intellectual property, in particular, those patents to which we have secured exclusive rights. Our licensors may not successfully prosecute the patent applications to which we are licensed. Even if patents issue in respect of these patent applications, our licensors may fail to maintain these patents, may determine not to pursue litigation against other companies that are infringing these patents, or may pursue such litigation less aggressively than we would. Without protection for the intellectual property we license, other companies might be able to offer substantially identical products for sale, which could adversely affect our competitive business position and harm our business prospects. In addition, we sublicense our rights under various third-party licenses to our collaborators. Any impairment of these sublicensed rights could result in reduced revenues under our collaboration agreements or result in termination of an agreement by one or more of our collaborators.

Other companies or organizations may challenge our patent rights or may assert patent rights that prevent us from developing and commercializing our products.

RNAi is a relatively new scientific field, the commercial exploitation of which has resulted in many different patents and patent applications from organizations and individuals seeking to obtain patent protection in the field. We have obtained grants and issuances of RNAi patents and have licensed many of these patents from third parties on an exclusive basis. The issued patents and pending patent applications in the United States and in key markets around the world that we own or license claim many different methods, compositions and processes relating to the discovery, development, manufacture and commercialization of RNAi therapeutics.

Specifically, we have a portfolio of patents, patent applications and other intellectual property covering: fundamental aspects of the structure and uses of siRNAs, including their use as therapeutics, and RNAi-related mechanisms; chemical modifications to siRNAs that improve their suitability for therapeutic and other uses; siRNAs directed to specific targets as treatments for particular diseases; delivery technologies, such as in the fields of carbohydrate conjugates and cationic liposomes; and all aspects of our specific development candidates.

As the field of RNAi therapeutics is maturing, patent applications are being fully processed by national patent offices around the world. There is uncertainty about which patents will issue, and, if they do, as to when, to whom, and with what claims. It is likely that there will be significant litigation and other proceedings, such as interference, reexamination and opposition proceedings, as well as *inter partes* and post-grant review proceedings introduced by provisions of the America Invents Act, which became available to third party challengers on September 16, 2012, in various patent offices relating to patent rights in the RNAi field. For example, various third parties have initiated oppositions to patents in our McSwiggen, Kreutzer-Limmer and Tuschl II series in the EPO and in other jurisdictions. We expect that additional oppositions will be filed in the EPO and elsewhere, and other challenges will be raised relating to other patents and patent applications in our portfolio. In many cases, the possibility of appeal exists for either us or our opponents, and it may be years before final, unappealable rulings are made with respect to these patents in certain jurisdictions. The timing and outcome of these and other proceedings is uncertain and may adversely affect our business if we are not successful in defending the patentability and scope of our pending and issued patent claims. In addition, third parties may attempt to invalidate our intellectual property rights. Even if our rights are not directly challenged, disputes could lead to the weakening of our intellectual property rights. Our defense against any attempt by third parties to circumvent or invalidate our intellectual property rights could be costly to us, could require significant time and attention of our management and could have a material adverse effect on our business and our ability to successfully compete in the field of RNAi.

There are many issued and pending patents that claim aspects of oligonucleotide chemistry and modifications that we may need for our siRNA therapeutic candidates. There are also many issued patents that claim targeting genes or portions of genes that may be relevant for siRNA drugs we wish to develop. In addition, there may be issued and pending patent applications that may be asserted against us in a court proceeding or otherwise based upon the asserting party's belief that we may need such patents for our siRNA therapeutic ca ndidates. Thus, it is possible that one or more organizations will hold patent rights to which we may need a license, or hold patent rights which could be asserted against us. If those organizations refuse to grant us a license to such patent rights on re asonable terms and/or a court rules that we need such patent rights that have been asserted against us and we are not able to obtain a license on reasonable terms, we may be unable to market products or perform research and development or other activities covered by such patents. For example, Silence Therapeutics plc, or Silence, has publicly stated that in July 2017 it issued (but presently has not yet served), a claim in the English and Welsh High Court of Justice, Chancery Division, Patent Court, naming us, our wholly owned subsidiary Alnylam UK Limited, and The Medicines Company UK Ltd as co-defendants. Silence has stated that the claim seeks a determination that it is entitled to supplementary protection certificates, or SPCs, based on a European patent held by Silence, that Silence alleges covers certain of our product candidates. An SPC is an intellectual property right that could extend the life of the Silence patent in relation to a specified product for a period of up to five additional years bring ing the expiration date to 2028. We have stated in response that we do not believe that any of our products infringe any valid patent held by Silence, and that we will vigorously defend any claim brought against us by Silence.

If we become involved in patent litigation or other proceedings related to a determination of rights, we could incur substantial costs and expenses, substantial liability for damages or be required to stop our product development and commercialization efforts.

Third parties may sue us for infringing their patent rights. Likewise, we may need to resort to litigation to enforce a patent issued or licensed to us or to determine the scope and validity of proprietary rights of others or protect our proprietary information and trade secrets. For example, during the second quarter of 2015, we filed a trade secret misappropriation lawsuit against Dicerna Pharmaceuticals, Inc., or Dicerna, to protect our rights in the RNAi assets we purchased from Merck. A third party may also claim that we have improperly obtained or used its confidential or proprietary information. For example, in March 2011, Arbutus (formerly Tekmira) filed a civil complaint against us alleging, among other things, misappropriation of its confidential and proprietary information and trade secrets. In November 2012, we settled this litigation and restructured our contractual relationship with Arbutus. In connection with this restructuring, we incurred a $65.0 million charge to operating expenses during the quarter ended December 31, 2012.

Furthermore, third parties may challenge the inventorship of our patents or licensed patents. For example, in March 2011, The University of Utah, or Utah, filed a complaint against us, Max Planck Gesellschaft Zur Foerderung Der Wissenschaften e.V. and Max Planck Innovation, together, Max Planck, Whitehead, MIT and UMass, claiming that a professor of Utah was the sole inventor, or in the alternative, a joint inventor of certain of our in-licensed patents. Utah was seeking correction of inventorship of the Tuschl patents, unspecified damages and other relief. After several years of court proceedings and discovery, the Court granted our motions for summary judgment, and dismissed Utah's state law damages claims as well. During the pendency of this litigation, as well as the Arbutus litigation described above, we incurred significant costs, and in each case, the litigation diverted the attention of our management and other resources that would otherwise have been engaged in other activities.

In addition, in connection with certain license and collaboration agreements, we have agreed to indemnify certain third parties for certain costs incurred in connection with litigation relating to intellectual property rights or the subject matter of the agreements. The cost to us of any litigation or other proceeding relating to intellectual property rights, even if resolved in our favor, could be substantial, and litigation would divert our management's efforts. Some of our competitors may be able to sustain the costs of complex patent litigation more effectively than we can because they have substantially greater resources. Uncertainties resulting from the initiation and continuation of any litigation could delay our research and development efforts and limit our ability to continue our operations.

If any parties successfully claim that our creation or use of proprietary technologies infringes upon or otherwise violates their intellectual property rights, we might be forced to pay damages, potentially including treble damages, if we are found to have willfully infringed on such parties' patent rights. In addition to any damages we might have to pay, a court could require us to stop the infringing activity or obtain a license. Any license required under any patent may not be made available on commercially acceptable terms, if at all. In addition, such licenses are likely to be non-exclusive and, therefore, our competitors may have access to the same technology licensed to us. If we fail to obtain a required license and are unable to design around a patent, we may be unable to effectively market some of our technology and products, which could limit our ability to generate revenues or achieve profitability and possibly prevent us from generating revenue sufficient to sustain our operations. Moreover, we expect that a number of our collaborations will provide that royalties payable to us for licenses to our intellectual property may be offset by amounts paid by our collaborators to third parties who have competing or superior intellectual property positions in the relevant fields, which could result in significant reductions in our revenues from products developed through collaborations.

If we fail to comply with our obligations under any licenses or related agreements, we may be required to pay damages and could lose license or other rights that are necessary for developing and protecting our RNAi technology and any related product candidates that we develop, or we could lose certain rights to grant sublicenses.

Our current licenses impose, and any future licenses we enter into are likely to impose, various development, commercialization, funding, milestone, royalty, diligence, sublicensing, insurance, patent prosecution and enforcement, and other obligations on us. If we breach any of these obligations, or use the intellectual property licensed to us in an unauthorized manner, we may be required to pay damages and the licensor may have the right to terminate the license or render the license non-exclusive, which could result in us being unable to develop, manufacture, market and sell products that are covered by the licensed technology or enable a competitor to gain access to the licensed technology. For example, in 2013, Arbutus (formerly Tekmira) notified us that it believed it had achieved a $5.0 million milestone payment under our cross-license agreement relating to the manufacture of ALN-VSP clinical trial material for use in China. We notified Arbutus that we did not believe that the milestone has been achieved under the terms of the cross-license agreement. In August 2013, we initiated binding arbitration proceedings seeking a declaratory judgment that Arbutus had not yet met the conditions of the milestone and was not entitled to payment at the time. The Arbutus arbitration hearing was held in May 2015. On March 9, 2016, the arbitration panel ruled in our favor and as a result, no milestone payment is due to Arbutus at this time. The grounds on which Arbutus could appeal this ruling were limited and Arbutus did not appeal by the deadline.

Moreover, our licensors may own or control intellectual property that has not been licensed to us and, as a result, we may be subject to claims, regardless of their merit, that we are infringing or otherwise violating the licensor's rights. In addition, while we cannot currently determine the amount of the royalty obligations we will be required to pay on sales of future products, if any, the amounts may be significant. The amount of our future royalty obligations will depend on the technology and intellectual property we use in products that we successfully develop and commercialize, if any. Therefore, even if we successfully develop and commercialize products, we may be unable to achieve or maintain profitability.

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

In order to protect our proprietary technology and processes, we rely in part on confidentiality agreements with our collaborators, employees, consultants, outside scientific collaborators and sponsored researchers, and other advisors. These agreements may not effectively prevent disclosure of confidential information and may not provide an adequate remedy in the event of unauthorized disclosure of confidential information. In addition, others may independently discover trade secrets and proprietary information, and in such cases we could not assert any trade secret rights against such party. Costly and time-consuming litigation could be necessary to enforce and determine the scope of our proprietary rights, and failure to obtain or maintain trade secret protection could adversely affect our competitive business position.

Risks Related to Competition

The pharmaceutical market is intensely competitive. If we are unable to compete effectively with existing drugs, new treatment methods and new technologies, we may be unable to commercialize successfully any drugs that we develop.

The pharmaceutical market is intensely competitive and rapidly changing. Many large pharmaceutical and biotechnology companies, academic institutions, governmental agencies and other public and private research organizations are pursuing the development of novel drugs for the same diseases that we are targeting or expect to target. Many of our competitors have:

- much greater financial, technical and human resources than we have at every stage of the discovery, development, manufacture and commercialization of products;
- more extensive experience in pre-clinical testing, conducting clinical trials, obtaining regulatory approvals, and in manufacturing, marketing and selling drug products;
- product candidates that are based on previously tested or accepted technologies;
- products that have been approved or are in late stages of development; and
- collaborative arrangements in our target markets with leading companies and research institutions.

We will face intense competition from drugs that have already been approved and accepted by the medical community for the treatment of the conditions for which we may develop drugs. We also expect to face competition from new drugs that enter the market. We believe a number of drugs are currently under development, and may become commercially available in the future, for the treatment of conditions for which we may try to develop drugs. These drugs may be more effective, safer, less expensive, or marketed and sold more effectively, than any products we develop. For example, we are developing patisiran for the treatment of hATTR amyloidosis. We have completed enrollment in our ongoing APOLLO Phase 3 clinical trial and expect to report top-line data from our Phase 3 clinical trial in mid-2017. We are aware of other approved products used to treat this disease, including tafamidis, marketed

by Pfizer, as well as product candidates in various stages of clinical development, including an investigational drug being developed by Ionis. Ionis has completed enrollment in its ongoing Phase 3 clinical trial in hATTR amyloidosis and in May 2017 reported positive top-line efficacy data and limited safety data, including thrombocytopenia and renal insufficiency SAEs. Patisiran may not compete favorably with these products and product candidates, and even if approved, it may not achieve commercial success.

If we successfully develop product candidates, and obtain approval for them, we will face competition based on many different factors, including:

- the safety and effectiveness of our products relative to alternative therapies, if any;
- the ease with which our products can be administered and the extent to which patients accept relatively new routes of administration;
- the timing and scope of regulatory approvals for these products;
- the availability and cost of manufacturing, marketing and sales capabilities;
- price;
- reimbursement coverage; and
- patent position.

Our competitors may develop or commercialize products with significant advantages over any products we develop based on any of the factors listed above or on other factors. Our competitors may therefore be more successful in commercializing their products than we are, which could adversely affect our competitive position and business. Competitive products may make any products we develop obsolete or noncompetitive before we can recover the expenses of developing and commercializing our product candidates. Such competitors could also recruit our employees, which could negatively impact our level of expertise and the ability to execute on our business plan. Furthermore, we also face competition from existing and new treatment methods that reduce or eliminate the need for drugs, such as the use of advanced medical devices. The development of new medical devices or other treatment methods for the diseases we are targeting could make our product candidates noncompetitive, obsolete or uneconomical.

We face competition from other companies that are working to develop novel drugs and technology platforms using technology similar to ours. If these companies develop drugs more rapidly than we do or their technologies, including delivery technologies, are more effective, our ability to successfully commercialize drugs may be adversely affected.

In addition to the competition we face from competing drugs in general, we also face competition from other companies working to develop novel drugs using technology that competes more directly with our own. We are aware of several other companies that are working to develop RNAi therapeutic products. Some of these companies are seeking, as we are, to develop chemically synthesized siRNAs as drugs. Others are following a gene therapy approach, with the goal of treating patients not with synthetic siRNAs but with synthetic, exogenously-introduced genes designed to produce siRNA-like molecules within cells. Companies working on chemically synthesized siRNAs include Takeda, Marina Biotech, Inc., Arrowhead Research Corporation, or Arrowhead, and its subsidiary, Calando Pharmaceuticals, Inc., or Calando, Quark Pharmaceuticals, Inc., or Quark, Silence, Arbutus, Sylentis S.A.U., or Sylentis, Dicerna, WAVE Life Sciences Ltd. and Arcturus Therapeutics, Inc. In addition, we granted licenses or options for licenses to Ionis, Benitec Ltd., Arrowhead, and its subsidiary, Calando, Arbutus, Quark, Sylentis and others under which these companies may independently develop RNAi therapeutics against a limited number of targets. Any one of these companies may develop its RNAi technology more rapidly and more effectively than us.

In addition, as a result of agreements that we have entered into, Arrowhead, as the assignee of F. Hoffmann-La Roche Ltd, and Takeda have obtained non-exclusive licenses, and Arrowhead, as the assignee of Novartis Pharma AG, has obtained specific exclusive licenses for 30 gene targets, to certain aspects of our technology that give them the right to compete with us in certain circumstances. We also compete with companies working to develop antisense-based drugs. Like RNAi therapeutics, antisense drugs target messenger RNAs, or mRNAs, in order to suppress the activity of specific genes. Ionis (formerly Isis) is currently marketing an antisense drug and has several antisense product candidates in clinical trials, including one for the treatment of hATTR amyloidosis. Ionis is also developing antisense drugs using ligand-conjugated GalNAc technology licensed from us, and these drugs have been shown to have increased potency at lower doses in clinical and pre-clinical studies, compared with antisense drugs that do not use such licensed GalNAc technology. The development of antisense drugs is more advanced than that of RNAi therapeutics, and antisense technology may become the preferred technology for drugs that target mRNAs to silence specific genes.

In addition to competition with respect to RNAi and with respect to specific products, we face substantial competition to discover and develop safe and effective means to deliver siRNAs to the relevant cell and tissue types. Safe and effective means to deliver siRNAs to the relevant cell and tissue types may be developed by our competitors, and our ability to successfully commercialize a competitive product would be adversely affected. In addition, substantial resources are being expended by third

parties i n the effort to discover and develop a safe and effective means of delivering siRNAs into the relevant cell and tissue types, both in academic laboratories and in the corporate sector. Some of our competitors have substantially greater resources than we do , and if our competitors are able to negotiate exclusive access to those delivery solutions developed by third parties, we may be unable to successfully commercialize our product candidates.

Risks Related to Our Common Stock

If our stock price fluctuates, purchasers of our common stock could incur substantial losses.

The market price of our common stock has fluctuated significantly and may continue to fluctuate significantly in response to factors that are beyond our control. The stock market in general has from time to time experienced extreme price and volume fluctuations, and the biotechnology in particular has experienced extreme price and volume fluctuations. The market prices of securities of pharmaceutical and biotechnology companies have been extremely volatile, and have experienced fluctuations that often have been unrelated or disproportionate to the clinical development progress or operating performance of these companies, including as a result of adverse development events. These broad market and sector fluctuations have resulted and could in the future result in extreme fluctuations in the price of our common stock, which could cause purchasers of our common stock to incur substantial losses.

We may incur significant costs from class action litigation due to stock volatility.

Our stock price may fluctuate for many reasons, including as a result of public announcements regarding the progress of our development efforts or the development efforts of our collaborators and/or competitors, the addition or departure of our key personnel, variations in our quarterly operating results and changes in market valuations of pharmaceutical and biotechnology companies. For example, in October 2016, we announced that we were discontinuing the development of revusiran and our stock price declined significantly as a result. When the market price of a stock has been volatile as our stock price has been, holders of that stock have occasionally brought securities class action litigation against the company that issued the stock. If any of our stockholders were to bring a lawsuit of this type against us, even if the lawsuit is without merit, we could incur substantial costs defending the lawsuit. The lawsuit could also divert the time and attention of our management.

Sales of additional shares of our common stock, including by us or our directors and officers, could cause the price of our common stock to decline.

Sales of substantial amounts of our common stock in the public market, or the availability of such shares for sale, by us or others, including the issuance of common stock upon exercise of outstanding options, could adversely affect the price of our common stock.

Sanofi Genzyme's ownership of our common stock could delay or prevent a change in corporate control.

Sanofi Genzyme currently holds approximately 12 percent of our outstanding common stock and has the right to increase its ownership up to 30 percent, as well as the right to maintain its ownership percentage through the term of our collaboration, subject to certain limitations. This concentration of ownership may harm the market price of our common stock by:

- delaying, deferring or preventing a change in control of our company;
- impeding a merger, consolidation, takeover or other business combination involving our company; or
- discouraging a potential acquirer from making a tender offer or otherwise attempting to obtain control of our company.

Anti-takeover provisions in our charter documents and under Delaware law could make an acquisition of us, which may be beneficial to our stockholders, more difficult and may prevent attempts by our stockholders to replace or remove our current management.

Provisions in our certificate of incorporation and our bylaws may delay or prevent an acquisition of us or a change in our management. In addition, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. Because our board of directors is responsible for appointing the members of our management team, these provisions could in turn affect any attempt by our stockholders to replace current members of our management team. These provisions include:

- a classified board of directors;
- a prohibition on actions by our stockholders by written consent;

- limitations on the removal of directors; and
- advance notice requirements for election to our board of directors and for proposing matters that can be acted upon at stockholder meetings.

In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which prohibits a person who owns in excess of 15 percent of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired in excess of 15 percent of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner. These provisions would apply even if the proposed merger or acquisition could be considered beneficial by some stockholders.

ITEM 6. EXHIBITS.

10.1	Second Amended and Restated 2009 Stock Incentive Plan.
10.2	Forms of Incentive Stock Option Agreement, Nonstatutory Stock Option Agreements, Restricted Stock Agreement and Restricted Stock Unit Award Agreement under Second Amended and Restated 2009 Stock Incentive Plan.
10.3	Amended and Restated 2004 Employee Stock Purchase Plan.
10.4	Letter Agreement between the Registrant and Manmeet S. Soni dated April 20, 2017.
31.1	Certification of principal executive officer pursuant to Rule 13a-14(a) promulgated under the Securities Exchange Act of 1934, as amended.
31.2	Certification of principal financial officer pursuant to Rule 13a-14(a) promulgated under the Securities Exchange Act of 1934, as amended.
32.1	Certification of principal executive officer pursuant to Rule 13a-14(b) promulgated under the Securities Exchange Act of 1934, as amended, and Section 1350 of Chapter 63 of Title 18 of the United States Code.
32.2	Certification of principal financial officer pursuant to Rule 13a-14(b) promulgated under the Securities Exchange Act of 1934, as amended, and Section 1350 of Chapter 63 of Title 18 of the United States Code.
101	The following materials from the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2017, formatted in XBRL (Extensible Business Reporting Language): (i) the Condensed Consolidated Balance Sheets, (ii) the Condensed Consolidated Statements of Comprehensive Loss, (iii) the Condensed Consolidated Statements of Cash Flows, and (iv) Notes to Condensed Consolidated Financial Statements.

SIGNAT URES

Pursuant to the requirements of the Securities Exchange Act of 1934, the Registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized.

ALNYLAM PHARMACEUTICALS, INC.

Date: August 9, 2017

/s/ John M. Maraganore

John M. Maraganore, Ph.D.
Chief Executive Officer
(Principal Executive Officer)

Date: August 9, 2017

/s/ Manmeet S. Soni

Manmeet S. Soni
Senior Vice President, Chief Financial Officer
(Principal Financial Officer)

Exhibit 10.1

ALNYLAM PHARMACEUTICALS, INC.

SECOND AMENDED AND RESTATED
2009 STOCK INCENTIVE PLAN

1. Purpose

The purpose of this Second Amended and Restated 2009 Stock Incentive Plan (the " ***Plan*** " or the " ***Second Amended and Restated Plan*** ") of Alnylam Pharmaceuticals, Inc., a Delaware corporation (the " ***Company*** "), is to advance the interests of the Company's stockholders by enhancing the Company's ability to attract, retain and motivate persons who are expected to make important contributions to the Company by providing such persons with equity ownership opportunities and performance-based incentives that are intended to better align the interests of such persons with those of the Company's stockholders. Except where the context otherwise requires, the term " ***Company*** " shall include any of the Company's present or future parent or subsidiary corporations as defined in Sections 424(e) or (f) of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the " ***Code*** ") and any other business venture (including, without limitation, joint venture or limited liability company) in which the Company has a controlling interest, as determined by the Board of Directors of the Company (the " ***Board*** ").

2. Eligibility

All of the Company's employees, officers and directors are eligible to be granted options, stock appreciation rights (" ***SARs*** "), restricted stock, restricted stock units (" ***RSUs*** ") and other stock-based awards (each, an " ***Award*** ") under the Plan. Consultants and advisors to the Company (as such terms are defined and interpreted for purposes of Form S-8 (or any successor form)) are also eligible to be granted Awards. Each person who is granted an Award under the Plan is deemed a " ***Participant*** ."

3. Administration and Delegation

(a) Administration by Board of Directors . The Plan will be administered by the Board. The Board shall have authority to grant Awards and to adopt, amend and repeal such administrative rules, guidelines and practices relating to the Plan as it shall deem advisable. The Board may construe and interpret the terms of the Plan and any Award agreements entered into under the Plan. The Board may correct any defect, supply any omission or reconcile any inconsistency in the Plan or any Award in the manner and to the extent it shall deem expedient to carry the Plan into effect and it shall be the sole and final judge of such expediency. All decisions by the Board shall be made in the Board's sole discretion and shall be final and binding on all persons having or claiming any interest in the Plan or in any Award.

(b) Appointment of Committees . To the extent permitted by applicable law, the Board may delegate any or all of its powers under the Plan to one or more committees or subcommittees of the Board (a " ***Committee*** "). All references in the Plan to the " ***Board*** " shall mean the Board or a Committee of the Board or the officers referred to in Section 3(c) to the extent that the Board's powers or authority under the Plan have been delegated to such Committee or officers.

(c) Delegation to Officers . To the extent permitted by applicable law, the Board may delegate to one or more officers of the Company the power to grant Options and other Awards that constitute rights under Delaware law (subject to any limitations under the Plan) to employees or officers of the Company or any of its present or future subsidiary corporations and to exercise such other powers under the Plan as

the Board may determine, provided that the Board shall fix the terms of the Awards to be granted by such officers (including the exercise price of the Awards, which may include a formula by which the exercise price will be determined) and the maximum number of shares subject to such Awards that the officers may grant; provided further, however, that no officer shall be authorized to grant Awards to any "executive officer" of the Company (as defined by Rule 3b-7 under the Securities Exchange Act of 1934, as amended (the "***Exchange Act***")) or to any "officer" of the Company (as defined by Rule 16a-1 under the Exchange Act, an "***Executive Officer***"). The Board may not delegate authority under this Section 3(c) to grant restricted stock, unless Delaware law then permits such delegation.

(d) Awards to Non-employee Directors. Discretionary Awards to directors who are not employees of the Company at the time of grant ("***Non-employee Directors***") will only be granted and administered by a Committee, all of the members of which are independent as defined by the rules of the NASDAQ Stock Market ("NASDAQ").

4. Stock Available for Awards

(a) Number of Shares; Share Counting.

(1) Authorized Number of Shares. Subject to adjustment under Section 10, Awards may be made under the Plan for up to 15,480,000 shares of common stock, $0.01 par value per share, of the Company (the "***Common Stock***"), any or all of which Awards may be in the form of Incentive Stock Options (as hereinafter defined). Shares issued under the Plan may consist in whole or in part of authorized but unissued shares or treasury shares.

(2) Fungible Share Pool. Subject to adjustment under Section 10, any Award that is not a Full-Value Award shall be counted against the share limits specified in Sections 4(a)(1) and 4(b)(2) as one share for each share of Common Stock subject to such Award and any Award that is a Full-Value Award shall be counted against the share limits specified in Sections 4(a)(1) and 4(b)(2) as 1.5 shares for each one share of Common Stock subject to such Full-Value Award. "***Full-Value Award***" means any Restricted Stock Award or Other Stock-Based Award (each as defined below). To the extent a share that was subject to an Award that counted as one share is returned to the Plan pursuant to Section 4(a)(3), each applicable share reserve will be credited with one share. To the extent that a share that was subject to a Full-Value Award that counted as 1.5 shares is returned to the Plan pursuant to Section 4(a)(3), each applicable share reserve will be credited with 1.5 shares.

(3) Share Counting. For purposes of counting the number of shares available for the grant of Awards under the Plan and under the sub-limits contained in Section 4(b)(2), (i) all shares of Common Stock covered by independent SARs shall be counted against the number of shares available for the grant of Awards; *provided*, *however*, that independent SARs that may be settled only in cash shall not be so counted; (ii) if any Award (A) expires or is terminated, surrendered or canceled without having been fully exercised or is forfeited in whole or in part (including as the result of shares of Common Stock subject to such Award being repurchased by the Company at the original issuance price pursuant to a contractual repurchase right) or (B) results in any Common Stock not being issued (including as a result of an independent SAR that was settleable either in cash or in stock actually being settled in cash), the unused Common Stock covered by such Award shall again be available for the grant of Awards; *provided*, *however*, in the case of Incentive Stock Options (as hereinafter defined), the foregoing shall be subject to any limitations under the Code; and provided further, in the case of independent SARs, that the full number of shares subject to any stock-settled SAR shall be counted against the shares available under the Plan and against the sub-limits listed in the first clause of this Section in proportion to the portion of the SAR actually exercised regardless of the number of shares actually used to settle such SAR upon exercise; (iii) shares of Common Stock delivered (by actual delivery, attestation, or net exercise) to the

Company by a Participant to (A) purchase shares of Common Stock upon the exercise of an Award or (B) satisfy tax withholding obligations (including shares retained from the Award creating the tax obligation) shall not be added back to the number of shares available for the future grant of Awards; and (iv) shares of Common Stock repurchased by the Company on the open market using the proceeds from the exercise of an Award shall not increase the number of shares available for future grant of Awards.

(b) Sub-limits. Subject to adjustment under Section 10, the following sub-limits on the number of shares subject to Awards shall apply:

(1) Section 162(m) Per-Participant Limit. The maximum number of shares of Common Stock with respect to which Awards may be granted to any Participant under the Plan shall be 500,000 per calendar year, except in the calendar year in which the Participant is hired by the Company, in which case the maximum number of shares shall be 1,000,000. For purposes of the foregoing limit, the combination of an Option in tandem with a SAR (as each is hereafter defined) shall be treated as a single Award. The per Participant limit described in this Section 4(b)(1) shall be construed and applied consistently with Section 162(m) of the Code or any successor provision thereto, and the regulations thereunder ("***Section 162(m)***").

(2) Limits on Awards to Non-employee Directors. The maximum number of shares with respect to which Awards may be granted, in the aggregate, to Non-employee Directors shall be 10% of the maximum number of authorized shares set forth in Section 4(a)(1). The maximum number of shares subject to Awards granted to an individual in connection with such individual's initial appointment or election as a Non-employee Director shall be 50,000. The maximum number of shares subject to Awards granted to a Non-employee Director in any calendar year in connection with such individual's service on the Board (excluding for this purpose any shares subject to Awards granted under the preceding sentence) shall be 22,500.

(c) Substitute Awards. In connection with a merger or consolidation of an entity with the Company or the acquisition by the Company of property or stock of an entity, the Board may grant awards in substitution for any options, stock or stock-based awards granted by such entity or an affiliate thereof. Substitute Awards may be granted on such terms as the Board deems appropriate in the circumstances, notwithstanding any limitations on Awards contained in the Plan. Substitute Awards shall not count against the overall share limit set forth in Section 4(a)(1) or any sub-limits contained in the Plan, except as may be required by reason of Section 422 and related provisions of the Code.

(d) Minimum Vesting. Except as provided in the following sentence, and notwithstanding anything in the Plan to the contrary, Awards granted to Participants shall not become exercisable and/or vested (as applicable) prior to the first year anniversary of the date of grant. Notwithstanding the foregoing, (i) the Board may, in its discretion, either at the time of grant or at any time thereafter, impose a faster vesting schedule than the schedule prescribed by the preceding sentence in the following extraordinary circumstances: death or disability of the Participant, or a change in control of the Company, and (ii) the vesting schedule prescribed by the preceding sentence shall not apply to Awards granted, in the aggregate, for up to 5% of the maximum number of authorized shares set forth in Section 4(a)(1).

5. Stock Options

(a) General. The Board may grant options to purchase Common Stock (each, an "***Option***") and determine the number of shares of Common Stock to be covered by each Option, the exercise price of each Option and the conditions and limitations applicable to the exercise of each Option, including conditions relating to applicable federal or state securities laws, as it considers necessary or advisable. An Option that is not intended to be an Incentive Stock Option (as hereinafter defined) shall be designated a "***Nonstatutory Stock Option***".

(b) Incentive Stock Options . An Option that the Board intends to be an "incentive stock option" as defined in Section 422 of the Code (an " ***Incentive Stock Option*** ") shall only be granted to employees of Alnylam Pharmaceuticals, Inc., any of Alnylam Pharmaceuticals, Inc.'s present or future parent or subsidiary corporations as defined in Sections 424(e) or (f) of the Code, and any other entities the employees of which are eligible to receive Incentive Stock Options under the Code, and shall be subject to and shall be construed consistently with the requirements of Section 422 of the Code. The Company shall have no liability to a Participant, or any other party, if an Option (or any part thereof) that is intended to be an Incentive Stock Option is not an Incentive Stock Option or if the Company converts an Incentive Stock Option to a Nonstatutory Stock Option.

(c) Exercise Price . The Board shall establish the exercise price of each Option and specify the exercise price in the applicable option agreement. The exercise price shall be not less than 100% of the Fair Market Value (as defined below) on the date the Option is granted; provided that if the Board approves the grant of an Option with an exercise price to be determined on a future date, the exercise price shall be not less than 100% of the Fair Market Value on such future date. " ***Fair Market Value*** " of a share of Common Stock for purposes of the Plan will be determined as follows:

(1) if the Common Stock trades on a national securities exchange, the closing sale price (for the primary trading session) on the date of grant;

(2) if the Common Stock does not trade on any such exchange, the average of the closing bid and asked prices as reported by an authorized OTCBB market data vendor as listed on the OTCBB website (otcbb.com) on the date of grant; or

(3) if the Common Stock is not publicly traded, the Board will determine the Fair Market Value for purposes of the Plan using any measure of value it determines to be appropriate (including, as it considers appropriate, relying on appraisals) in a manner consistent with the valuation principles under Section 409A of the Code, except as the Board or Committee may expressly determine otherwise.

For any date that is not a trading day, the Fair Market Value of a share of Common Stock for such date will be determined by using the closing sale price or average of the bid and asked prices, as appropriate, for the immediately preceding trading day and with the timing in the formulas above adjusted accordingly. The Board can substitute a particular time of day or other measure of "closing sale price" or "bid and asked prices" if appropriate because of exchange or market procedures or can, in its sole discretion, use weighted averages either on a daily basis or such longer period as complies with Section 409A of the Code. The Board has sole discretion to determine the Fair Market Value for purposes of this Plan, and all Awards are conditioned on the Participants' agreement that the Board's determination is conclusive and binding even though others might make a different determination.

(d) Duration of Options . Each Option shall be exercisable at such times and subject to such terms and conditions as the Board may specify in the applicable option agreement; *provided* , *however* , that no Option will be granted for a term in excess of 10 years.

(e) Exercise of Option . Options may be exercised by delivery to the Company of a written notice of exercise signed by the proper person or by any other form of notice (including electronic notice) approved by the Company, together with payment in full as specified in Section 5(f) for the number of shares for which the Option is exercised. Shares of Common Stock subject to the Option will be delivered by the Company as soon as practicable following exercise.

(f) Payment Upon Exercise . Common Stock purchased upon the exercise of an Option granted under the Plan shall be paid for as follows:

(1) in cash or by check, payable to the order of the Company;

(2) except as may otherwise be provided in the applicable option agreement, by (i) delivery of an irrevocable and unconditional undertaking by a creditworthy broker to deliver promptly to the Company sufficient funds to pay the exercise price and any required tax withholding or (ii) delivery by the Participant to the Company of a copy of irrevocable and unconditional instructions to a creditworthy broker to deliver promptly to the Company cash or a check sufficient to pay the exercise price and any required tax withholding;

(3) except as may otherwise be provided in the applicable option agreement, by delivery (either by actual delivery or attestation) of shares of Common Stock owned by the Participant valued at their Fair Market Value, provided (i) such method of payment is then permitted under applicable law, (ii) such Common Stock, if acquired directly from the Company, was owned by the Participant for such minimum period of time, if any, as may be established by the Board in its discretion; (iii) such Common Stock is not subject to any repurchase, forfeiture, unfulfilled vesting or other similar requirements and (iv) if the Participant is an Executive Officer, prior approval is obtained from the Board;

(4) with respect to Nonstatutory Options, and except as may otherwise be provided in the applicable option agreement, by delivery of a notice of "net exercise" to the Company, as a result of which the Participant would receive the number of shares of Common Stock underlying the Option so exercised reduced by the number of shares of Common Stock equal to the aggregate exercise price of the Option divided by the Fair Market Value on the date of exercise; provided, if the Participant is an Executive Officer, prior approval is obtained from the Board;

(5) to the extent permitted by applicable law and provided for in the applicable Option agreement or approved by the Board, in its sole discretion, by payment of such other lawful consideration as the Board may determine; or

(6) by any combination of the above permitted forms of payment.

(g) Limitation on Repricing . Unless such action is approved by the Company's stockholders: (1) no outstanding Option granted under the Plan may be amended to provide an exercise price per share that is lower than the then-current exercise price per share of such outstanding Option (other than adjustments pursuant to Section 10) and (2) the Board may not cancel any outstanding option (whether or not granted under the Plan) and grant in substitution therefor new Awards under the Plan covering the same or a different number of shares of Common Stock and having an exercise price per share lower than the then-current exercise price per share of the cancelled option or effect repricing by cancellation in exchange for cash.

6. Director Options

(a) Board Discretion . The Board retains the specific authority to, from time to time, determine the number of shares subject to Options granted to Non-employee Directors under this Section 6, subject to the aggregate and individual limitations on the number of shares issuable to Non-employee Directors contained in Section 4(b)(2). All Options granted to Non-employee Directors shall be Nonstatutory Stock Options. The Board also retains the specific authority to issue SARs, Restricted Stock Awards or Other Stock-Based Awards in lieu of Options, subject to the aggregate and individual limitations on the number of shares issuable to Non-employee Directors contained in Section 4(b)(2).

(b) Terms of Director Options . Options granted under this Section 6 shall (i) have an exercise price equal to the Fair Market Value on the date of grant, (ii) subject to Section 4(d) and except as otherwise set forth in an option agreement, vest in full on the first anniversary of the date of grant provided that the individual is serving on the Board on such date (or, in the case of Options granted under Section 6(a) to a newly elected or appointed director, as to one -third of the shares subject to the Option on each of the first, second and third anniversaries of the date of grant); provided that no additional vesting shall take place after the Participant ceases to serve as a director and further provided that the Board may provide for accelerated vesting in the case of death, disability or change in control, (iii) expire on the earlier of 10 years from the date of grant or three months following cessation of service on the Board, provided that such three month period shall be extended to five years following cessation of service on the Board for any director with five or more years of continuous service on the Board, and (iv) contain such other terms and conditions as the Board shall determine.

7. Stock Appreciation Rights

(a) General . The Board may grant Awards consisting of SARs entitling the holder, upon exercise, to receive an amount of Common Stock or cash or a combination thereof (such form to be determined by the Board) determined by reference to appreciation, from and after the date of grant, in the Fair Market Value of a share of Common Stock over the measurement price established pursuant to Section 7(c). The date as of which such appreciation is determined shall be the exercise date.

(b) Grants . SARs may be granted in tandem with, or independently of, Options granted under the Plan.

(1) Tandem Awards . When SARs are expressly granted in tandem with Options, (i) the SAR will be exercisable only at such time or times, and to the extent, that the related Option is exercisable (except to the extent designated by the Board in connection with a Reorganization Event and will be exercisable in accordance with the procedure required for exercise of the related Option; (ii) the SAR will terminate and no longer be exercisable upon the termination or exercise of the related Option, except to the extent designated by the Board in connection with a Reorganization Event and except that a SAR granted with respect to less than the full number of shares covered by an Option will not be reduced until the number of shares as to which the related Option has been exercised or has terminated exceeds the number of shares not covered by the SAR; (iii) the Option will terminate and no longer be exercisable upon the exercise of the related SAR; and (iv) the SAR will be transferable only with the related Option.

(2) Independent SARs . A SAR not expressly granted in tandem with an Option will become exercisable at such time or times, and on such conditions, as the Board may specify in the SAR Award.

(c) Measurement Price . The Board shall establish the measurement price of each SAR and specify it in the applicable SAR agreement. The measurement price shall not be less than 100% of the Fair Market Value on the date the SAR is granted; provided that if the Board approves the grant of a SAR with a measurement price to be determined on a future date, the measurement price shall be not less than 100% of the Fair Market Value on such future date.

(d) Duration of SARs . Each SAR shall be exercisable at such times and subject to such terms and conditions as the Board may specify in the applicable SAR agreement; *provided* , *however* , that no SAR will be granted with a term in excess of 10 years.

(e) Exercise of SARs . SARs may be exercised by delivery to the Company of a written notice of exercise signed by the proper person or by any other form of notice (including electronic notice) approved by the Company, together with any other documents required by the Board.

(f) Limitation on Repricing . Unless such action is approved by the Company's stockholders: (1) no outstanding SAR granted under the Plan may be amended to provide an exercise price per share that is lower than the then-current exercise price per share of such outstanding SAR (other than adjustments pursuant to Section 10) and (2) the Board may not cancel any outstanding SAR (whether or not granted under the Plan) and grant in substitution therefor new Awards under the Plan covering the same or a different number of shares of Common Stock and having an exercise price per share lower than the then-current exercise price per share of the cancelled SAR or effect repricing by cancellation in exchange for cash.

8. Restricted Stock; Restricted Stock Units

(a) General . The Board may grant Awards entitling recipients to acquire shares of Common Stock (" ***Restricted Stock*** "), subject to the right of the Company to repurchase all or part of such shares at their issue price or other stated or formula price (or to require forfeiture of such shares if issued at no cost) from the recipient in the event that conditions specified by the Board in the applicable Award are not satisfied prior to the end of the applicable restriction period or periods established by the Board for such Award. Instead of granting Awards for Restricted Stock, the Board may grant Awards entitling the recipient to receive shares of Common Stock or cash to be delivered at the time such Award vests (" ***Restricted Stock Units*** ") (Restricted Stock and Restricted Stock Units are each referred to herein as a " ***Restricted Stock Award*** ").

(b) Terms and Conditions for All Restricted Stock Awards . Subject to the provisions of the Plan (including, without limitation, Section 4(d)), the Board shall determine the terms and conditions of a Restricted Stock Award, including the conditions for vesting and repurchase (or forfeiture) and the issue price, if any.

(c) Additional Provisions Relating to Restricted Stock .

(1) Dividends . Participants holding shares of Restricted Stock will be entitled to dividends paid with respect to such shares; provided, however, with respect to any unvested share of Restricted Stock, dividends shall accrue during the vesting period but shall not be paid unless and until such share of Restricted Stock has vested. Any such accrued dividends that are attributable to a share of Restricted Stock shall be paid to the Participant in cash or, in the sole discretion of the Board, in shares of Common Stock having a Fair Market Value (on the date of distribution) equal to the amount of such dividends, upon the vesting of such share and, if such share is forfeited, the Participant shall have no right to such dividends.

(2) Stock Certificates . The Company may require that any stock certificates issued in respect of shares of Restricted Stock shall be deposited in escrow by the Participant, together with a stock power endorsed in blank, with the Company (or its designee). At the expiration of the applicable restriction periods, the Company (or such designee) shall deliver the certificates no longer subject to such restrictions to the Participant or if the Participant has died, to the beneficiary designated, in a manner determined by the Board, by a Participant to receive amounts due or exercise rights of the Participant in the event of the Participant's death (the " ***Designated Beneficiary*** "). In the absence of an effective designation by a Participant, " ***Designated Beneficiary*** " shall mean the Participant's estate.

(d) Additional Provisions Relating to Restricted Stock Units .

(1) Settlement . Upon the vesting of and/or lapsing of any other restrictions (i.e., settlement) with respect to each Restricted Stock Unit, the Participant shall be entitled to receive from the Company one share of Common Stock or an amount of cash equal to the Fair Market Value of one share of Common Stock, as provided in the applicable Award agreement. The Board may, in its discretion, provide that settlement of Restricted Stock Units shall be deferred, on a mandatory basis or at the election of the Participant in a manner that complies with Section 409A of the Code.

(2) Voting Rights . A Participant shall have no voting rights with respect to any Restricted Stock Units.

(3) Dividend Equivalents . To the extent provided by the Board, in its sole discretion, a grant of Restricted Stock Units may provide Participants with the right to receive an amount equal to any dividends or other distributions declared and paid on an equal number of outstanding shares of Common Stock (" ***Dividend Equivalents*** "). Dividend Equivalents shall be credited to an account for the Participants, shall be settled in cash and/or shares of Common Stock and may be subject to the same restrictions on transfer and forfeitability as the Restricted Stock Units with respect to which paid, as determined by the Board in its sole discretion, subject in each case to such terms and conditions as the Board shall establish, in each case to be set forth in the applicable Award agreement. Notwithstanding the foregoing, with respect to any unvested Restricted Stock Unit, Dividend Equivalents shall accrue during the vesting period but shall not be paid unless and until such Restricted Stock Unit has vested. Any such Dividend Equivalents that have accrued and are attributable to a Restricted Stock Unit shall be paid to the Participant in cash or, in the sole discretion of the Board, in shares of Common Stock having a Fair Market Value (on the date of distribution) equal to the amount of such Dividend Equivalents, upon the vesting of such Restricted Stock Unit and, if such Restricted Stock Unit is forfeited, the Participant shall have no right to such Dividend Equivalents.

9. Other Stock-Based Awards

(a) General . Other Awards of shares of Common Stock, and other Awards that are valued in whole or in part by reference to, or are otherwise based on, shares of Common Stock or other property, may be granted hereunder to Participants (" ***Other Stock-Based Awards*** "), including without limitation Awards entitling recipients to receive shares of Common Stock to be delivered in the future. Such Other Stock-Based Awards shall also be available as a form of payment in the settlement of other Awards granted under the Plan or as payment in lieu of compensation to which a Participant is otherwise entitled. Other Stock-Based Awards may be paid in shares of Common Stock or cash, as the Board shall determine.

(b) Terms and Conditions . Subject to the provisions of the Plan (including, without limitation, Section 4(d)), the Board shall determine the terms and conditions of each Other Stock-Based Award, including any purchase price applicable thereto.

10. Adjustments for Changes in Common Stock and Certain Other Events

(a) Changes in Capitalization . In the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event, or any dividend or distribution to holders of Common Stock other than an ordinary cash dividend, (i) the number and class of securities available under the Plan, (ii) the sub-limits, fungible pool and share counting rules set forth in Sections 4(a) and 4(b), (iii) the minimum vesting provisions set forth in Section 4(d), (iv) the number and class of securities and exercise price per share of each

outstanding Option and each Option issuable under Section 6, (v) the share - and per -share provisions and the measurement price of each SAR, (vi) the number of shares subject to and the repurchase price per share subject to each outstanding Restricted Stock Award and (vii) the share - and per -share -related provisions and the purchase price, if any, of each outstanding Other Stock -Based Award, shall be equitably adjusted by the Company (or substituted Awards may be made, if applicable) in the manner determined by the Board. Without limiting the generality of the foregoing, in the event the Company effects a split of the Common Stock by means of a stock dividend and the exercise price of and the number of shares subject to an outstanding Option are adjusted as of the date of the distribution of the dividend (rather than as of the record date for such dividend), then an optionee who exercises an Option between the record date and the distribution date for such stock dividend shall be entitled to receive, on the distribution date, the stock dividend with respect to the shares of Common Stock acquired upon such Option exercise, notwithstanding the fact that such shares were not outstanding as of the close of business on the record date for such stock dividend.

(b) Reorganization Events .

(1) Definition . A " ***Reorganization Event*** " shall mean: (a) any merger or consolidation of the Company with or into another entity where the stockholders of the Company immediately before the merger or consolidation would not, immediately after the merger or consolidation, beneficially own, directly or indirectly, shares representing a majority of the outstanding voting shares of the resulting or successor entity (or its ultimate parent, if applicable), (b) any transfer or disposition of all of the Common Stock of the Company for cash, securities or other property pursuant to a share exchange or other transaction or (c) any liquidation or dissolution of the Company.

(2) Consequences of a Reorganization Event on Awards Other than Restricted Stock Awards . In connection with a Reorganization Event, the Board may take any one or more of the following actions as to all or any (or any portion of) outstanding Awards other than Restricted Stock Awards on such terms as the Board determines: (i) provide that Awards shall be assumed, or substantially equivalent Awards shall be substituted, by the acquiring or succeeding corporation (or an affiliate thereof), (ii) upon written notice to a Participant, provide that the Participant's unexercised Awards will terminate immediately prior to the consummation of such Reorganization Event unless exercised by the Participant within a specified period following the date of such notice, (iii) provide that outstanding Awards shall become exercisable, realizable, or deliverable, or restrictions applicable to an Award shall lapse, in whole or in part prior to or upon such Reorganization Event, (iv) in the event of a Reorganization Event under the terms of which holders of Common Stock will receive upon consummation thereof a cash payment for each share surrendered in the Reorganization Event (the " ***Acquisition Price*** "), make or provide for a cash payment to a Participant equal to the excess, if any, of (A) the Acquisition Price times the number of shares of Common Stock subject to the Participant's Awards (to the extent the exercise price does not exceed the Acquisition Price) over (B) the aggregate exercise price of all such outstanding Awards and any applicable tax withholdings, in exchange for the termination of such Awards, (v) provide that, in connection with a liquidation or dissolution of the Company, Awards shall convert into the right to receive liquidation proceeds (if applicable, net of the exercise price thereof and any applicable tax withholdings) and (vi) any combination of the foregoing. In taking any of the actions permitted under this Section 10(b), the Board shall not be obligated by the Plan to treat all Awards, all Awards held by a Participant, or all Awards of the same type, identically.

For purposes of clause (i) above, an Option shall be considered assumed if, following consummation of the Reorganization Event, the Option confers the right to purchase, for each share of Common Stock subject to the Option immediately prior to the consummation of the Reorganization Event, the consideration (whether cash, securities or other property) received as a result of the Reorganization Event by holders of Common Stock for each share of Common Stock held immediately

prior to the consummation of the Reorganization Event (and if holders were offered a choice of consideration, the type of consideration chosen by the holders of a majority of the outstanding shares of Common Stock); provided, however, that if the consideration received as a result of the Reorganization Event is not solely common stock of the acquiring or succeeding corporation (or an affiliate thereof), the Company may, with the consent of the acquiring or succeeding corporation, provide for the consideration to be received upon the exercise of Options to consist solely of common stock of the acquiring or succeeding corporation (or an affiliate thereof) equivalent in value (as determined by the Board) to the per share consideration received by holders of outstanding shares of Common Stock as a result of the Reorganization Event.

(3) Consequences of a Reorganization Event on Restricted Stock Awards . Upon the occurrence of a Reorganization Event other than a liquidation or dissolution of the Company, the repurchase and other rights of the Company under each outstanding Restricted Stock Award shall inure to the benefit of the Company's successor and shall, unless the Board determines otherwise, apply to the cash, securities or other property which the Common Stock was converted into or exchanged for pursuant to such Reorganization Event in the same manner and to the same extent as they applied to the Common Stock subject to such Restricted Stock Award; *provided* , *however* , that the Board may provide for termination or deemed satisfaction of such repurchase or other rights under the instrument evidencing any Restricted Stock Award or any other agreement between a Participant and the Company, either initially or by amendment. Upon the occurrence of a Reorganization Event involving the liquidation or dissolution of the Company, except to the extent specifically provided to the contrary in the instrument evidencing any Restricted Stock Award or any other agreement between a Participant and the Company, all restrictions and conditions on all Restricted Stock Awards then outstanding shall automatically be deemed terminated or satisfied.

11. General Provisions Applicable to Awards

(a) Transferability of Awards . Awards shall not be sold, assigned, transferred, pledged or otherwise encumbered by the person to whom they are granted, either voluntarily or by operation of law, except by will or the laws of descent and distribution or, other than in the case of an Incentive Stock Option, pursuant to a qualified domestic relations order, and, during the life of the Participant, shall be exercisable only by the Participant; *provided* , *however* , that the Board may permit or provide in an Award for the gratuitous transfer of the Award by the Participant to or for the benefit of any immediate family member, family trust or other entity established for the benefit of the Participant and/or an immediate family member thereof if, with respect to such proposed transferee, the Company would be eligible to use a Form S-8 for the registration of the sale of the Common Stock subject to such Award under the Securities Act of 1933, as amended; provided, further, that the Company shall not be required to recognize any such transfer until such time as the Participant and such permitted transferee shall, as a condition to such transfer, deliver to the Company a written instrument in form and substance satisfactory to the Company confirming that such transferee shall be bound by all of the terms and conditions of the Award. References to a Participant, to the extent relevant in the context, shall include references to authorized transferees.

(b) Documentation . Each Award shall be evidenced in such form (written, electronic or otherwise) as the Board shall determine. Each Award may contain terms and conditions in addition to those set forth in the Plan.

(c) Board Discretion . Except as otherwise provided by the Plan, each Award may be made alone or in addition or in relation to any other Award. The terms of each Award need not be identical, and the Board need not treat Participants uniformly.

(d) Termination of Status . The Board shall determine the effect on an Award of the disability, death, termination or other cessation of employment, authorized leave of absence or other change in the employment or other status of a Participant and the extent to which, and the period during which, the Participant, or the Participant's legal representative, conservator, guardian or Designated Beneficiary, may exercise rights under the Award.

(e) Withholding . The Participant must satisfy all applicable federal, state, and local or other income and employment tax withholding obligations before the Company will deliver stock certificates or otherwise recognize ownership of Common Stock under an Award. The Company may decide to satisfy the withholding obligations through additional withholding on salary or wages. If the Company elects not to or cannot withhold from other compensation, the Participant must pay the Company the full amount, if any, required for withholding or have a broker tender to the Company cash equal to the withholding obligations. Payment of withholding obligations is due before the Company will issue any shares on exercise or release from forfeiture of an Award or, if the Company so requires, at the same time as is payment of the exercise price unless the Company determines otherwise. A Participant may satisfy such tax obligations in whole or in part by delivery (either by actual delivery or attestation) of shares of Common Stock, including shares retained from the Award creating the tax obligation, valued at their Fair Market Value; *provided* , *however* , that if the Participant is an Executive Officer, prior approval is obtained from the Board; *provided further* , that where stock is being used to satisfy such tax obligations, the total tax withholding cannot exceed the Company's minimum statutory withholding obligations (based on minimum statutory withholding rates for federal and state tax purposes, including payroll taxes, that are applicable to such supplemental taxable income), unless withholding at a higher rate would not result in adverse accounting treatment (in which case such withholding shall not exceed maximum statutory withholding rates). Shares used to satisfy tax withholding requirements cannot be subject to any repurchase, forfeiture, unfulfilled vesting or other similar requirements.

(f) Amendment of Award . Except as otherwise provided in Section 4(d) with respect to the vesting of Awards, Section 11(i) with respect to Performance Awards or Section 12(d) with respect to actions requiring shareholder approval, the Board may amend, modify or terminate any outstanding Award, including but not limited to, substituting therefor another Award of the same or a different type, changing the date of exercise or realization, and converting an Incentive Stock Option to a Nonstatutory Stock Option. The Participant's consent to such action shall be required unless (i) the Board determines that the action, taking into account any related action, would not materially and adversely affect the Participant's rights under the Plan or (ii) the change is permitted under Section 10 hereof.

(g) Conditions on Delivery of Stock . The Company will not be obligated to deliver any shares of Common Stock pursuant to the Plan or to remove restrictions from shares previously delivered under the Plan until (i) all conditions of the Award have been met or removed to the satisfaction of the Company, (ii) in the opinion of the Company's counsel, all other legal matters in connection with the issuance and delivery of such shares have been satisfied, including any applicable securities laws and any applicable stock exchange or stock market rules and regulations, and (iii) the Participant has executed and delivered to the Company such representations or agreements as the Company may consider appropriate to satisfy the requirements of any applicable laws, rules or regulations.

(h) Acceleration . Except as otherwise provided in Sections 4(d) and 11(i), the Board may at any time provide that any Award shall become immediately exercisable in full or in part, free of some or all restrictions or conditions, or otherwise realizable in full or in part, as the case may be.

(i) Performance Awards .

(1) Grants . Restricted Stock Awards and Other Stock-Based Awards under the Plan may be made subject to the achievement of performance goals pursuant to this Section 11(i) (" ***Performance Awards*** "), subject to the limit in Section 4(b)(1) on shares covered by such grants and the terms of Section 4(d) related to minimum vesting requirements.

(2) Committee . Grants of Performance Awards to any Covered Employee intended to qualify as "performance-based compensation" under Section 162(m) (" ***Performance-Based Compensation*** ") shall be made only by a Committee (or subcommittee of a Committee) comprised solely of two or more directors eligible to serve on a committee making Awards qualifying as "performance-based compensation" under Section 162(m). In the case of such Awards granted to Covered Employees, references to the Board or to a Committee shall be treated as referring to such Committee or subcommittee. " ***Covered Employee*** " shall mean any person who is, or whom the Committee, in its discretion, determines may be, a "covered employee" under Section 162(m)(3) of the Code.

(3) Performance Measures . For any Award that is intended to qualify as Performance-Based Compensation, the Committee shall specify that the degree of granting and vesting shall be subject to the achievement of one or more objective performance measures established by the Committee, which shall be based on the relative or absolute attainment of specified levels of one or any combination of the following: net income, earnings before or after discontinued operations, interest, taxes, depreciation and/or amortization, operating profit before or after discontinued operations and/or taxes, sales, sales growth, earnings growth, cash flow or cash position, gross margins, stock price, market share, return on sales, assets, equity or investment, improvement of financial ratings, achievement of balance sheet or income statement objectives, total shareholder return, market penetration goals, unit volume, geographic business expansion goals, drug discovery or other scientific goals, pre-clinical or clinical goals, organizational goals, regulatory approvals, cost targets and goals relating to acquisitions, divestitures and/or strategic partnerships.

(4) Adjustments . Notwithstanding any provision of the Plan, with respect to any Performance Award that is intended to qualify as Performance-Based Compensation, the Committee may adjust downwards, but not upwards, the cash or number of Shares payable pursuant to such Award, and the Committee may not waive the achievement of the applicable performance measures except in the case of the death or disability of the Participant or a change in control of the Company.

(5) Other . The Committee shall have the power to impose such other restrictions on Performance Awards as it may deem necessary or appropriate to ensure that such Awards satisfy all requirements for Performance-Based Compensation.

12. Miscellaneous

(a) No Right To Employment or Other Status . No person shall have any claim or right to be granted an Award, and the grant of an Award shall not be construed as giving a Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with a Participant free from any liability or claim under the Plan, except as expressly provided in the applicable Award.

(b) No Rights As Stockholder . Subject to the provisions of the applicable Award, no Participant or Designated Beneficiary shall have any rights as a stockholder with respect to any shares of Common Stock to be distributed with respect to an Award until becoming the record holder of such shares.

(c) Effective Date and Term of Second Amended and Restated Plan . The Second Amended and Restated Plan shall become effective on the date the Second Amended and Restated Plan is approved by the Company's stockholders (the " ***Effective Date*** "). No Awards shall be granted under the Second Amended and Restated Plan after the expiration of 10 years from the Effective Date, but Awards previously granted may extend beyond that date.

(d) Amendment of Plan . The Board may amend, suspend or terminate the Plan or any portion thereof at any time provided that (i) to the extent required by Section 162(m), no Award granted to a Participant that is intended to comply with Section 162(m) after the date of such amendment shall become exercisable, realizable or vested, as applicable to such Award, unless and until the Company's stockholders approve such amendment if required by Section 162(m) (including the vote required under Section 162(m)); (ii) no amendment that would require stockholder approval under the NASDAQ rules may be made effective unless and until the Company's stockholders approve such amendment; and (iii) if NASDAQ amends its corporate governance rules so that such rules no longer require stockholder approval of "material amendments" to equity compensation plans, then, from and after the effective date of such amendment to the NASDAQ rules, no amendment to the Plan (A) materially increasing the number of shares authorized under the Plan (other than pursuant to Sections 4(c) or 10), (B) expanding the types of Awards that may be granted under the Plan, or (C) materially expanding the class of participants eligible to participate in the Plan shall be effective unless and until the Company's stockholders approve such amendment. In addition, if at any time the approval of the Company's stockholders is required as to any other modification or amendment under Section 422 of the Code or any successor provision with respect to Incentive Stock Options, the Board may not effect such modification or amendment without such approval. Unless otherwise specified in the amendment, any amendment to the Plan adopted in accordance with this Section 12(d) shall apply to, and be binding on the holders of, all Awards outstanding under the Plan at the time the amendment is adopted, provided the Board determines that such amendment does not materially and adversely affect the rights of Participants under the Plan. Options may be granted that are conditioned upon stockholder approval of any amendment adding shares of Common Stock to the Plan, but no such conditioned Options may be exercised until stockholder approval is obtained. If stockholder approval is not obtained, all such conditioned Option grants shall be cancelled and be of no further force or effect.

(e) Authorization of Sub-Plans . The Board may from time to time establish one or more sub-plans under the Plan for purposes of satisfying applicable securities or tax laws of various jurisdictions. The Board shall establish such sub-plans by adopting supplements to the Plan containing (i) such limitations on the Board's discretion under the Plan as the Board deems necessary or desirable or (ii) such additional terms and conditions not otherwise inconsistent with the Plan as the Board shall deem necessary or desirable. All supplements adopted by the Board shall be deemed to be part of the Plan, but each supplement shall apply only to Participants within the affected jurisdiction and the Company shall not be required to provide copies of any supplement to Participants in any jurisdiction which is not the subject of such supplement.

(f) Non-U.S. Participants . Awards may be granted to Participants who are non-U.S. citizens or residents employed outside the United States, or both, on such terms and conditions different from those applicable to Awards to Participants employed in the United States as may, in the judgment of the Board, be necessary or desirable in order to recognize differences in local law or tax policy. The Board also may impose conditions on the exercise or vesting of Awards in order to minimize the Board's obligation with respect to tax equalization for Participants on assignments outside their home country. The Board may approve such supplements to or amendments, restatements or alternative versions of the Plan as it may consider necessary or appropriate for such purposes, without thereby affecting the terms of this Plan as in effect for any other purpose, and the Secretary or other appropriate officer of the Company may certify any such document as having been approved and adopted in the same manner as this Plan.

(g) Compliance with Section 409A of the Code . Except as provided in individual Award agreements initially or by amendment, if and to the extent any portion of any payment, compensation or other benefit provided to a Participant in connection with his or her employment termination is determined to constitute "nonqualified deferred compensation" within the meaning of Section 409A of the Code and the Participant is a specified employee as defined in Section 409A(a)(2)(B)(i) of the Code, as determined by the Company in accordance with its procedures, by which determination the Participant (through accepting the Award) agrees that he or she is bound, such portion of the payment, compensation or other benefit shall not be paid before the day that is six months plus one day after the date of "separation from service" (as determined under Section 409A of the Code) (the " ***New Payment Date*** "), except as Section 409A of the Code may then permit. The aggregate of any payments that otherwise would have been paid to the Participant during the period between the date of separation from service and the New Payment Date shall be paid to the Participant in a lump sum on such New Payment Date, and any remaining payments will be paid on their original schedule.

The Company makes no representations or warranty and shall have no liability to the Participant or any other person if any provisions of or payments, compensation or other benefits under the Plan are determined to constitute nonqualified deferred compensation subject to Section 409A of the Code but do not to satisfy the conditions of that section. The Company intends that any Award determined to constitute "nonqualified deferred compensation" within the meaning of Section 409A of the Code complies with Section 409A of the Code. To the extent that any provision of the Plan or of any Award agreement is ambiguous as to its compliance with Section 409A of the Code, the provision shall be read in such a manner so that the Plan and such Award complies with Section 409A of the Code. Accordingly, to the extent that any Award is determined to constitute "nonqualified deferred compensation" within the meaning of Section 409A of the Code, the Award shall be subject to such additional rules and requirements as specified by the Board from time to time in order to comply with Section 409A of the Code.

(h) Limitations on Liability . Notwithstanding any other provisions of the Plan, no individual acting as a director, officer, other employee, or agent of the Company will be liable to any Participant, former Participant, spouse, beneficiary, or any other person for any claim, loss, liability, or expense incurred in connection with the Plan, nor will such individual be personally liable with respect to the Plan because of any contract or other instrument he or she executes in his or her capacity as a director, officer, other employee, or agent of the Company. The Company will indemnify and hold harmless each director, officer, other employee, or agent of the Company to whom any duty or power relating to the administration or interpretation of the Plan has been or will be delegated, against any cost or expense (including attorneys' fees) or liability (including any sum paid in settlement of a claim with the Board's approval) arising out of any act or omission to act concerning this Plan unless arising out of such person's own fraud or bad faith.

(i) Governing Law . The provisions of the Plan and all Awards made hereunder shall be governed by and interpreted in accordance with the laws of the State of Delaware, excluding choice-of-law principles of the law of such state that would require the application of the laws of a jurisdiction other than such state.

(j) Clawback . Grants made under this Plan shall be subject to the Company's clawback policies in effect from time to time.

Exhibit 10.2

ALNYLAM PHARMACEUTICALS, INC.

Incentive Stock Option Agreement
Granted Under Second Amended and Restated 2009 Stock Incentive Plan

1. Grant of Option .

This agreement evidences the grant by Alnylam Pharmaceuticals, Inc,, a Delaware corporation (the "Company"), on _____ , 20[ ] (the "Grant Date") to [_____], an employee of the Company (the "Participant"), of an option to purchase, in whole or in part, on the terms provided herein and in the Company's Second Amended and Restated 2009 Stock Incentive Plan (the "Plan"), a total of [_____] shares (the "Shares") of common stock, $.01 par value per share, of the Company ("Common Stock") at $[_____] per Share. Unless earlier terminated, this option shall expire at 5:00 p.m., Eastern time, on [_____] (the "Final Exercise Date").

It is intended that the option evidenced by this agreement shall be an incentive stock option as defined in Section 422 of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the "Code"). Except as otherwise indicated by the context, the term "Participant", as used in this option, shall be deemed to include any person who acquires the right to exercise this option validly under its terms.

2. Vesting Schedule .

This option will become exercisable ("vest") as to 25% of the original number of Shares on the first anniversary of the Grant Date and as to an additional 6.25% of the original number of Shares at the end of each successive three-month period following the first anniversary of the Grant Date until the fourth anniversary of the Grant Date. Notwithstanding the foregoing, this option will become fully exercisable in the event the Participant dies prior to the Final Exercise Date while he or she is an Eligible Participant and the Company has not terminated such relationship for "Cause" as specified in Section 3(e) below.

The right of exercise shall be cumulative so that to the extent the option is not exercised in any period to the maximum extent permissible it shall continue to be exercisable, in whole or in part, with respect to all Shares for which it is vested until the earlier of the Final Exercise Date or the termination of this option under Section 3 hereof or the Plan.

3. Exercise of Option .

(a) Form of Exercise . Each election to exercise this option shall be in writing, signed by the Participant, and received by the Company at its principal office, accompanied by this agreement, and payment in full in the manner provided in the Plan. The Participant may purchase less than the number of shares covered hereby, provided that no partial exercise of this option may be for any fractional share or for fewer than ten whole shares.

(b) Continuous Relationship with the Company Required . Except as otherwise provided in this Section 3, this option may not be exercised unless the Participant, at the time he or she exercises this option, is, and has been at all times since the Grant Date, an employee or officer of, or consultant or advisor to, the Company or any parent or subsidiary of the Company as defined in Section 424(e) or (f) of the Code (an "Eligible Participant").

(c) Termination of Relationship with the Company . If the Participant ceases to be an Eligible Participant for any reason, then, except as provided in paragraphs (d) and (e) below, the right to exercise this option shall terminate three months after such cessation (but in no event after the Final Exercise Date), provided that this option shall be exercisable only to the extent that the Participant was entitled to exercise this option on the date of such cessation. Notwithstanding the foregoing, if the Participant, prior to the Final Exercise Date, violates the non-competition or confidentiality provisions of any employment contract, confidentiality and nondisclosure agreement or other agreement between the Participant and the Company, the right to exercise this option shall terminate immediately upon such violation.

(d) Exercise Period Upon Death or Disability . If the Participant dies or becomes disabled (within the meaning of Section 22(e)(3) of the Code) prior to the Final Exercise Date while he or she is an Eligible Participant and the Company has not terminated such relationship for "cause" as specified in paragraph (e) below, this option shall be exercisable, within the period of one year following the date of death or disability of the Participant, by the Participant (or in the case of death by an authorized transferee), provided that this option shall be exercisable only to the extent that this option was exercisable by the Participant on the date of his or her death or disability (after taking into account any acceleration), and further provided that this option shall not be exercisable after the Final Exercise Date.

(e) Termination for Cause . If, prior to the Final Exercise Date, the Participant's employment or other relationship is terminated by the Company for Cause (as defined below), the right to exercise this option shall terminate immediately upon the effective date of such termination of employment. "Cause" shall mean willful misconduct by the Participant or willful failure by the Participant to perform his or her responsibilities to the Company (including, without limitation, breach by the Participant of any provision of any employment, consulting, advisory, nondisclosure, non-competition or other similar agreement between the Participant and the Company), as determined by the Company, which determination shall be conclusive. The Participant's employment or other relationship shall be considered to have been terminated for Cause if the Company determines, within 30 days after the Participant's resignation, that termination for Cause was warranted.

4. Tax Matters .

(a) Withholding . No Shares will be issued pursuant to the exercise of this option unless and until the Participant pays to the Company, or makes provision satisfactory to the Company for payment of, any federal, state or local withholding taxes required by law to be withheld in respect of this option.

(b) Disqualifying Disposition . If the Participant disposes of Shares acquired upon exercise of this option within two years from the Grant Date or one year after such Shares were acquired pursuant to exercise of this option, the Participant shall notify the Company in writing of such disposition.

5. Transfer Restrictions .

This option may not be sold, assigned, transferred, pledged or otherwise encumbered by the Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the lifetime of the Participant, this option shall be exercisable only by the Participant.

6. Provisions of the Plan .

This option is subject to the provisions of the Plan (including the provisions relating to amendments to the Plan), a copy of which is furnished to the Participant with this option.

7. Data Privacy Consent .

In order to administer the Plan and this Agreement and to implement or structure future equity grants, the Company, its subsidiaries and affiliates and certain agents thereof (together, the "Relevant Companies") may process any and all personal or professional data, including but not limited to Social Security or other identification number, home address and telephone number, date of birth and other information that is necessary or desirable for the administration of the Plan and/or this Agreement (the "Relevant Information"). By entering into this Agreement, the Participant (i) authorizes the Company to collect, process, register and transfer to the Relevant Companies all Relevant Information; (ii) waives any privacy rights the Participant may have with respect to the Relevant Information; (iii) authorizes the Relevant Companies to store and transmit such information in electronic form; and (iv) authorizes the transfer of the Relevant Information to any jurisdiction in which the Relevant Companies consider appropriate. The Participant shall have access to, and the right to change, the Relevant Information. Relevant Information will only be used in accordance with applicable law.

IN WITNESS WHEREOF, the Company has caused this option to be executed under its corporate seal by its duly authorized officer. This option shall take effect as a sealed instrument.

ALNYLAM PHARMACEUTICALS, INC.

By: _____

Name: _____
Title: _____

PARTICIPANT'S ACCEPTANCE

The undersigned hereby accepts the foregoing option and agrees to the terms and conditions thereof. Electronic acceptance of this Agreement pursuant to the Company's instructions for the Participant (including through an online acceptance process) is acceptable. The undersigned hereby acknowledges receipt of a copy of the Company's Second Amended and Restated 2009 Stock Incentive Plan.

PARTICIPANT:

_____

Address: _____

_____

ALNYLAM PHARMACEUTICALS, INC.

Nonstatutory Stock Option Agreement
Granted Under Second Amended and Restated 2009 Stock Incentive Plan

1. Grant of Option .

This agreement evidences the grant by Alnylam Pharmaceuticals, Inc., a Delaware corporation (the "Company"), on _____ , 20[ ] (the "Grant Date") to [_____], an [employee], [consultant], [director] of the Company (the "Participant"), of an option to purchase, in whole or in part, on the terms provided herein and in the Company's Second Amended and Restated 2009 Stock Incentive Plan (the "Plan"), a total of [_____] shares (the "Shares") of common stock, $.01 par value per share, of the Company ("Common Stock") at $[_____] per Share. Unless earlier terminated, this option shall expire at 5:00 p.m., Eastern time, on [_____] (the "Final Exercise Date").

It is intended that the option evidenced by this agreement shall not be an incentive stock option as defined in Section 422 of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the "Code"). Except as otherwise indicated by the context, the term "Participant", as used in this option, shall be deemed to include any person who acquires the right to exercise this option validly under its terms.

2. Vesting Schedule .

This option will become exercisable ("vest") as to 25% of the original number of Shares on the first anniversary of the Grant Date and as to an additional 6.25 % of the original number of Shares at the end of each successive three-month period following the first anniversary of the Grant Date until the fourth anniversary of the Grant Date. Notwithstanding the foregoing, this option will become fully exercisable in the event the Participant dies prior to the Final Exercise Date while he or she is an Eligible Participant and the Company has not terminated such relationship for "Cause" as specified in Section 3(e) below.

The right of exercise shall be cumulative so that to the extent the option is not exercised in any period to the maximum extent permissible it shall continue to be exercisable, in whole or in part, with respect to all Shares for which it is vested until the earlier of the Final Exercise Date or the termination of this option under Section 3 hereof or the Plan.

3. Exercise of Option .

(a) Form of Exercise . Each election to exercise this option shall be in writing, signed by the Participant, and received by the Company at its principal office, accompanied by this agreement, and payment in full in the manner provided in the Plan. The Participant may purchase less than the number of shares covered hereby, provided that no partial exercise of this option may be for any fractional share or for fewer than ten whole shares.

(b) Continuous Relationship with the Company Required . Except as otherwise provided in this Section 3, this option may not be exercised unless the Participant, at the time he or she exercises this option, is, and has been at all times since the Grant Date, an [employee, officer or director of], or consultant or advisor to, the Company or any other entity the employees, officers, directors, consultants, or advisors of which are eligible to receive option grants under the Plan (an "Eligible Participant").

(c) Termination of Relationship with the Company . If the Participant ceases to be an Eligible Participant for any reason, then, except as provided in paragraphs (d) and (e) below, the right to exercise this option shall terminate three months after such cessation (but in no event after the Final Exercise Date), provided that this option shall be exercisable only to the extent that the Participant was entitled to exercise this option on the date of such cessation. Notwithstanding the foregoing, if the Participant, prior to the Final Exercise Date, violates the non-competition or confidentiality provisions of any employment contract, confidentiality and nondisclosure agreement or other agreement between the Participant and the Company, the right to exercise this option shall terminate immediately upon such violation.

(d) Exercise Period Upon Death or Disability . If the Participant dies or becomes disabled (within the meaning of Section 22(e)(3) of the Code) prior to the Final Exercise Date while he or she is an Eligible Participant and the Company has not terminated such relationship for "cause" as specified in paragraph (e) below, this option shall be exercisable, within the period of one year following the date of death or disability of the Participant, by the Participant (or in the case of death by an authorized transferee), provided that this option shall be exercisable only to the extent that this option was exercisable by the Participant on the date of his or her death or disability (after taking into account any acceleration), and further provided that this option shall not be exercisable after the Final Exercise Date.

(e) Termination for Cause . If, prior to the Final Exercise Date, the Participant's employment or other relationship with the Company is terminated by the Company for Cause (as defined below), the right to exercise this option shall terminate immediately upon the effective date of such termination of employment or other relationship. "Cause" shall mean willful misconduct by the Participant or willful failure by the Participant to perform his or her responsibilities to the Company (including, without limitation, breach by the Participant of any provision of any employment, consulting, advisory, nondisclosure, non-competition or other similar agreement between the Participant and the Company), as determined by the Company, which determination shall be conclusive. The Participant's employment or other relationship shall be considered to have been terminated for "Cause" if the Company determines, within 30 days after the Participant's resignation, that termination for Cause was warranted.

4. Withholding .

No Shares will be issued pursuant to the exercise of this option unless and until the Participant pays to the Company, or makes provision satisfactory to the Company for payment of, any federal, state or local withholding taxes required by law to be withheld in respect of this option.

5. Transfer Restrictions. This option may not be sold, assigned, transferred, pledged or otherwise encumbered by the Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the lifetime of the Participant, this option shall be exercisable only by the Participant.

6. Provisions of the Plan.

This option is subject to the provisions of the Plan (including the provisions relating to amendments to the Plan), a copy of which is furnished to the Participant with this option.

7. Data Privacy Consent. In order to administer the Plan and this Agreement and to implement or structure future equity grants, the Company, its subsidiaries and affiliates and certain agents thereof (together, the "Relevant Companies") may process any and all personal or professional data, including but not limited to Social Security or other identification number, home address and telephone number, date of birth and other information that is necessary or desirable for the administration of the Plan and/or this Agreement (the "Relevant Information"). By entering into this Agreement, the Participant (i) authorizes the Company to collect, process, register and transfer to the Relevant Companies all Relevant Information; (ii) waives any privacy rights the Participant may have with respect to the Relevant Information; (iii) authorizes the Relevant Companies to store and transmit such information in electronic form; and (iv) authorizes the transfer of the Relevant Information to any jurisdiction in which the Relevant Companies consider appropriate. The Participant shall have access to, and the right to change, the Relevant Information. Relevant Information will only be used in accordance with applicable law.

IN WITNESS WHEREOF, the Company has caused this option to be executed under its corporate seal by its duly authorized officer. This option shall take effect as a sealed instrument.

ALNYLAM PHARMACEUTICALS, INC.

By: _____

Name: _____
Title: _____

PARTICIPANT'S ACCEPTANCE

The undersigned hereby accepts the foregoing option and agrees to the terms and conditions thereof. Electronic acceptance of this Agreement pursuant to the Company's instructions for the Participant (including through an online acceptance process) is acceptable. The undersigned hereby acknowledges receipt of a copy of the Company's Second Amended and Restated 2009 Stock Incentive Plan.

PARTICIPANT:

_____

Address: _____

_____

ALNYLAM PHARMACEUTICALS, INC.

Nonstatutory Stock Option Agreement
Granted Under Second Amended and Restated 2009 Stock Incentive Plan

1. Grant of Option .

This Nonstatutory Stock Option Agreement ("Agreement") evidences the grant by Alnylam Pharmaceuticals, Inc., a Delaware corporation (the "Company"), on _____, 20[ ] (the "Grant Date") to [_____], an [employee], [consultant], [director] of the Company or one its subsidiaries (the "Participant"), of an option to purchase, in whole or in part, on the terms provided herein and in the Company's Second Amended and Restated 2009 Stock Incentive Plan (the "Plan"), a total of [_____] shares (the "Shares") of common stock, $0.01 par value per share, of the Company ("Common Stock") at $[_____] per Share. Unless earlier terminated, this option shall expire at 5:00 p.m., Eastern time, on [_____] (the "Final Exercise Date").

It is intended that the option evidenced by this agreement shall not be an incentive stock option as defined in Section 422 of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the "Code"). Except as otherwise indicated by the context, the term "Participant", as used in this option, shall be deemed to include any person who acquires the right to exercise this option validly under its terms.

2. Vesting Schedule .

This option will become exercisable ("vest") as to 25% of the original number of Shares on the first anniversary of the Grant Date and as to an additional 6.25 % of the original number of Shares at the end of each successive three-month period following the first anniversary of the Grant Date until the fourth anniversary of the Grant Date. Notwithstanding the foregoing, this option will become fully exercisable in the event the Participant dies prior to the Final Exercise Date while he or she is an Eligible Participant and the Company has not terminated such relationship for "Cause" as specified in Section 3(e) below.

The right of exercise shall be cumulative so that to the extent the option is not exercised in any period to the maximum extent permissible it shall continue to be exercisable, in whole or in part, with respect to all Shares for which it is vested until the earlier of the Final Exercise Date or the termination of this option under Section 3 hereof or the Plan.

3. Exercise of Option .

(a) Form of Exercise . Each election to exercise this option shall be in writing, signed by the Participant, and received by the Company at its principal office, accompanied by this agreement, and payment in full in the manner provided in the Plan. The Participant may purchase less than the number of shares covered hereby, provided that no partial exercise of this option may be for any fractional share or for fewer than ten whole shares.

(b) Continuous Relationship with the Company Required . Except as otherwise provided in this Section 3, this option may not be exercised unless the Participant, at the time he or she exercises this option, is, and has been at all times since the Grant Date, an [employee, officer or director of], or consultant or advisor to, the Company or any other entity the employees, officers, directors, consultants, or advisors of which are eligible to receive option grants under the Plan (an "Eligible Participant").

(c) Termination of Relationship with the Company . If the Participant ceases to be an Eligible Participant for any reason, then, except as provided in paragraphs (d) and (e) below, the right to exercise this option shall terminate three months after such cessation (but in no event after the Final Exercise Date), provided that this option shall be exercisable only to the extent that the Participant was entitled to exercise this option on the date of such cessation. Notwithstanding the foregoing, if the Participant, prior to the Final Exercise Date, violates the non-competition or confidentiality provisions of any employment contract, confidentiality and nondisclosure agreement or other agreement between the Participant and the Company, the right to exercise this option shall terminate immediately upon such violation.

(d) Exercise Period Upon Death or Disability . If the Participant dies or becomes disabled (within the meaning of Section 22(e)(3) of the Code) prior to the Final Exercise Date while he or she is an Eligible Participant and the Company has not terminated such relationship for "cause" as specified in paragraph (e) below, this option shall be exercisable, within the period of one year following the date of death or disability of the Participant, by the Participant (or in the case of death by an authorized transferee), provided that this option shall be exercisable only to the extent that this option was exercisable by the Participant on the date of his or her death or disability (after taking into account any acceleration), and further provided that this option shall not be exercisable after the Final Exercise Date.

(e) Termination for Cause . If, prior to the Final Exercise Date, the Participant's employment or other relationship with the Company is terminated by the Company for Cause (as defined below), the right to exercise this option shall terminate immediately upon the effective date of such termination of employment or other relationship. "Cause" shall mean willful misconduct by the Participant or willful failure by the Participant to perform his or her responsibilities to the Company (including, without limitation, breach by the Participant of any provision of any employment, consulting, advisory, nondisclosure, non-competition or other similar agreement between the Participant and the Company), as determined by the Company, which determination shall be conclusive. The Participant's employment or other relationship shall be considered to have been terminated for "Cause" if the Company determines, within 30 days after the Participant's resignation, that termination for Cause was warranted.

4. Tax Withholding .

The Participant acknowledges that, regardless of any action taken by the Company or any affiliate the ultimate liability for all income tax, social insurance, payroll tax, fringe benefits tax, payment on account or other tax-related items related to the Participant's participation in the Plan and legally applicable to the Participant ("Tax-Related Items"), is and remains the Participant's responsibility and may exceed the amount actually withheld by the Company or any affiliate. The Participant further acknowledges that the Company and/or any affiliate (i) makes no

representations or undertakings regarding the treatment of any Tax-Related Items in connection with any aspect of the option, including, but not limited to, the grant, vesting or exercise of the option, the subsequent sale of shares of Common Stock acquired pursuant to such exercise and the receipt of any dividends; and (ii) do not commit to and are under no obligation to structure the terms of the grant or any aspect of the option to reduce or eliminate the Participant's liability for Tax-Related Items or achieve any particular tax result. Further, if the Participant is subject to Tax-Related Items in more than one jurisdiction between the Grant Date and the date of any relevant taxable or tax withholding event, as applicable, the Participant acknowledges that the Company and/or any affiliate (or former employer, as applicable) may be required to withhold or account for Tax-Related Items in more than one jurisdiction. Prior to the relevant taxable or tax withholding event, as applicable, the Participant agrees to make adequate arrangements satisfactory to the Company and/or any affiliate to satisfy all Tax-Related Items. In this regard, the Participant authorizes the Company and/or any affiliate, or their respective agents, at their discretion, to satisfy the obligations with regard to all Tax-Related Items by withholding from proceeds of the sale of shares of Common Stock acquired at exercise of the option either through a voluntary sale or through a mandatory sale arranged by the Company (on the Participant's behalf pursuant to this authorization) without further consent unless the use of such withholding method is problematic under applicable tax or securities law or has materially adverse accounting consequences, in which case, the Participant agrees that the obligation for Tax-Related Items may be satisfied by withholding in shares of Common Stock to be issued at exercise of the option. The Company may withhold or account for Tax-Related Items by considering applicable minimum statutory withholding amounts or other applicable withholding rates, including maximum applicable rates, in which case the Participant will receive a refund of any over-withheld amount in cash and will have no entitlement to the Common Stock equivalent. If the obligation for Tax-Related Items is satisfied by withholding in shares of Common Stock, for tax purposes, the Participant is deemed to have been issued the full number of shares of Common Stock subject to the exercised options, notwithstanding that a number of the shares of Common Stock are held back solely for the purpose of paying the Tax-Related Items. Finally, the Participant agrees to pay to the Company or any affiliate, including through withholding from the Participant's wages or other cash compensation paid to the Participant by the Company and/or any affiliate, any amount of Tax-Related Items that the Company or any affiliate may be required to withhold or account for as a result of participation in the Plan that cannot be satisfied by the means previously described. The Company may refuse to issue or deliver the shares or the proceeds of the sale of shares of Common Stock, if the Participant fails to comply with his or her obligations in connection with the Tax-Related Items.

5. Transfer Restrictions .

This option may not be sold, assigned, transferred, pledged or otherwise encumbered by the Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the lifetime of the Participant, this option shall be exercisable only by the Participant.

6. Provisions of the Plan .

This option is subject to the provisions of the Plan (including the provisions relating to amendments to the Plan), a copy of which is furnished to the Participant with this option.

7. Nature of Grant . In accepting the grant, the Participant acknowledges, understands and agrees that:

(a) the Plan is established voluntarily by the Company, it is discretionary in nature and it may be modified, amended, suspended or terminated at any time by the Company's Board of Directors, or any Committee of the Board to which the Board may delegate its powers under the Plan ("Committee");

(b) the grant of the options is voluntary and occasional and does not create any contractual or other right to receive future grants of options (whether on the same or different terms), or benefits in lieu of options, even if options have been granted in the past;

(c) all decisions with respect to future grants of options or other grants, if any, will be at the sole discretion of the Board or Committee, including, but not limited to, the form and timing of the grant, the number of Shares subject to the grant, and the vesting and exercise provisions applicable to the grant;

(d) the option grant and the Participant's participation in the Plan shall not create a right to employment or be interpreted as forming an employment or services contract with the Company or any affiliate and shall not interfere with the ability of the Company, or affiliate, as applicable, to terminate Participant's employment or service relationship;

(e) the Participant is voluntarily participating in the Plan;

(f) the options and the shares of Common Stock subject to the options are not intended to replace any pension rights or compensation;

(g) the options and the shares of Common Stock subject to the options, and the income and value thereof, are an extraordinary item of compensation outside the scope of the Participant's employment (and employment contract, if any) and is not part of normal or expected compensation for any purpose, including, without limitation, calculating any severance, resignation, termination, redundancy, dismissal, end-of-service payments, bonuses, long-service awards, pension or retirement or welfare benefits or similar payments;

(h) the future value of the shares of Common Stock underlying the options is unknown, indeterminable and cannot be predicted with certainty;

(i) unless otherwise determined by the Board or Committee in its sole discretion, a termination of employment shall be effective from the date on which active employment or service ends and shall not be extended by any statutory or common law notice of termination period; the Committee shall have the exclusive discretion to determine when a termination of employment occurs for purposes of this grant of options;

(j) no claim or entitlement to compensation or damages shall arise from forfeiture of options resulting from the Participant ceasing to provide employment or other services to the Company or any affiliate (for any reason whatsoever whether or not later found to be invalid or in breach of employment laws in the jurisdiction where the Participant is employed or the terms of the Participant's employment agreement, if any), and in consideration of the grant of the

options to which the Participant is otherwise not entitled, the Participant irrevocably agrees never to institute any claim against the Company or any affiliate, waives his or her ability, if any, to bring any such claim, and releases the Company and affiliates from any such claim; if, notwithstanding the foregoing, any such claim is allowed by a court of competent jurisdiction, then, by participating in the Plan, the Participant shall be deemed irrevocably to have agreed not to pursue such claim and agrees to execute any and all documents necessary to request dismissal or withdrawal of such claim;

(k) unless otherwise provided herein, in the Plan or by the Company in its discretion, the options and the benefits evidenced by this Agreement do not create any entitlement to have the options or any such benefits transferred to, or assumed by, another company nor to be exchanged, cashed out or substituted for, in connection with any corporate transaction affecting the shares of Common Stock of the Company; and

(l) if the Participant resides or is employed outside the United States, the Participant acknowledges and agrees that neither the Company nor any affiliate shall be liable for any exchange rate fluctuation between Participant's local currency and the United States Dollar that may affect the value of the options or of any amounts due to Participant pursuant to the exercise of the options or the subsequent sale of any shares of Common Stock acquired upon exercise.

8. Electronic Delivery and Acceptance .

The Company may, in its sole discretion, decide to deliver any documents related to current or future participation in the Plan by electronic means. The Participant hereby consents to receive such documents by electronic delivery and agrees to participate in the Plan through an on-line or any electronic system established and maintained by the Company or a third party designated by the Company.

9. Governing Law and Venue .

This Agreement and all claims arising out of or based upon this Agreement or relating to the subject matter hereof shall be governed by and construed in accordance with the domestic substantive laws of the State of Delaware without giving effect to any choice or conflict of laws provision or rule that would cause the application of the domestic substantive laws of any other jurisdiction. Any legal proceeding arising out of this Plan or this Agreement shall be brought exclusively in the Federal or State courts located in the State of Delaware. The Participant agrees to submit to personal jurisdiction and to venue in those courts. The Participant further agrees to waive all legal challenges and defenses to the appropriateness of Delaware as the site of any such legal proceeding and to the application of the laws of the State of Delaware and any applicable Federal laws.

10. Language .

If the Participant received this Agreement, or any other document related to the option and/or the Plan translated into a language other than English and if the meaning of the translated version is different than the English version, the English version will control.

11. Severability .

The provisions of this Agreement are severable and if any one or more provisions are determined to be illegal or otherwise unenforceable, in whole or in part, the remaining provisions shall nevertheless be binding and enforceable.

12. Appendix .

Notwithstanding any provisions in this Agreement, the option grant shall be subject to any special terms and conditions set forth in any Appendix to this Agreement for the Participant's country. Moreover, if the Participant relocates to one of the countries included in the Appendix, the special terms and conditions for such country will apply to the Participant, to the extent the Company determines that the application of such terms and conditions is necessary or advisable for legal or administrative reasons. The Appendix constitutes part of this Agreement.

13. Imposition of Other Requirements .

The Company reserves the right to impose other requirements on the Participant's participation in the Plan, on the option and on any shares of Common Stock purchased upon exercise of the option, to the extent the Company determines it is necessary or advisable for legal or administrative reasons, and to require me to sign any additional agreements or undertakings that may be necessary to accomplish the foregoing.

14. Waiver .

The Participant acknowledges that a waiver by the Company of breach of any provision of this Agreement shall not operate or be construed as a waiver of any other provision of this Agreement, or of any subsequent breach by the Participant or any other participant.

15. Data Privacy Consent .

The Participant hereby explicitly and unambiguously consents to the collection, use and transfer, in electronic or other form, of the Participant's personal data as described in this Agreement and any other option grant materials ("Data") by and among, as applicable, the Company and its affiliates for the exclusive purpose of implementing, administering and managing the Participant's participation in the Plan. The Participant understands that the Company and the Company's affiliates may hold certain personal information about the Participant, including, but not limited to, the Participant's name, home address and telephone number, date of birth, social insurance number or other identification number, salary, nationality, job title, any shares of stock or directorships held in the Company, details of all options or any other entitlement to shares of stock awarded, canceled, exercised, vested, unvested or outstanding in the Participant's favor, for the exclusive purpose of implementing, administering and managing the Plan. The Participant understands that Data will be transferred to a designated broker or such other stock plan service provider as may be selected by the Company in the future, which is assisting the Company with the implementation, administration and management of the Plan. The Participant understands that the recipients of the Data may be located in the United States or elsewhere, and that the recipient’s country (e.g., the United States) may have different data privacy laws and protections than the Participant's country. The

Participant understands that if the Participant resides outside the United States, the Participant may request a list with the names and addresses of any potential recipients of the Data by contacting the Participant's local human resources representative. The Participant authorizes the Company, the Company's selected broker and any other possible recipients which may assist the Company (presently or in the future) with implementing, administering and managing the Plan to receive, possess, use, retain and transfer the Data, in electronic or other form, for the sole purposes of implementing, administering and managing the Participant's participation in the Plan. The Participant understands that Data will be held only as long as is necessary to implement, administer and manage the Participant's participation in the Plan. The Participant understands that if the Participant resides outside the United States, the Participant may, at any time, view Data, request additional information about the storage and processing of Data, require any necessary amendments to Data or refuse or withdraw the consents herein, in any case without cost, by contacting in writing the Participant's local human resources representative. Further, the Participant understands that the Participant is providing the consents herein on a purely voluntary basis. If the Participant does not consent, or if the Participant later seeks to revoke the Participant's consent, the Participant's employment status or service and career will not be adversely affected; the only adverse consequence of refusing or withdrawing the Participant's consent is that the Company would not be able to grant the Participant options or other equity awards or administer or maintain such awards. Therefore, the Participant understands that refusing or withdrawing the Participant's consent may affect the Participant's ability to participate in the Plan. For more information on the consequences of the Participant's refusal to consent or withdrawal of consent, the Participant understands that he or she may contact the Participant's local human resources representative.

IN WITNESS WHEREOF, the Company has caused this option to be executed under its corporate seal by its duly authorized officer. This option shall take effect as a sealed instrument.

ALNYLAM PHARMACEUTICALS, INC.

By: _____

Name: _____
Title: _____

PARTICIPANT'S ACCEPTANCE

The undersigned hereby accepts the foregoing option and agrees to the terms and conditions thereof. Electronic acceptance of this Agreement pursuant to the Company's instructions for the Participant (including through an online acceptance process) is acceptable. The undersigned hereby acknowledges receipt of a copy of the Company's Second Amended and Restated 2009 Stock Incentive Plan.

PARTICIPANT:

_____

Address: _____

_____

ALNYLAM PHARMACEUTICALS, INC.

Nonstatutory Stock Option Agreement
Granted Under Second Amended and Restated 2009 Stock Incentive Plan

1. Grant of Option .

This agreement evidences the grant by Alnylam Pharmaceuticals, Inc., a Delaware corporation (the "Company"), on _____ , 20[ ] (the "Grant Date") to [_____], a director of the Company (the "Participant"), of an option to purchase, in whole or in part, on the terms provided herein and in the Company's Second Amended and Restated 2009 Stock Incentive Plan (the "Plan"), a total of [_____] shares (the "Shares") of common stock, $.01 par value per share, of the Company ("Common Stock") at $[_____] per Share. Unless earlier terminated, this option shall expire at 5:00 p.m., Eastern time, on the earlier of [insert 10 years from the date of grant] or three months following cessation of service on the Board, provided that such three- month period shall be extended to five years following cessation of service on the Board of Directors for any director with five or more years of continuous service on the Board of Directors (the "Final Exercise Date").

It is intended that the option evidenced by this agreement shall not be an incentive stock option as defined in Section 422 of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the "Code"). Except as otherwise indicated by the context, the term "Participant", as used in this option, shall be deemed to include any person who acquires the right to exercise this option validly under its terms.

2. Vesting Schedule .

This option will become exercisable ("vest") as to [100% of the original number of Shares on the first anniversary of the Grant Date] [33⅓% of the original number of Shares on the first, second and third anniversary of the Grant Date] subject to continuous service with the Company through each such anniversary.

The right of exercise shall be cumulative so that to the extent the option is not exercised in any period to the maximum extent permissible it shall continue to be exercisable, in whole or in part, with respect to all Shares for which it is vested until the earlier of the Final Exercise Date or the termination of this option under Section 3 hereof or the Plan.

3. Exercise of Option .

(a) Form of Exercise . Each election to exercise this option shall be in writing, signed by the Participant, and received by the Company at its principal office, accompanied by this agreement, and payment in full in the manner provided in the Plan. The Participant may purchase less than the number of shares covered hereby, provided that no partial exercise of this option may be for any fractional share or for fewer than ten whole shares.

(b) Termination of Relationship with the Company . If the Participant ceases to provide services to the Company, the Participant may exercise this option through the Final Exercise Date, but only to the extent that the Participant was entitled to exercise this option on the date of such cessation of services.

4. Transfer Restrictions .

This option may not be sold, assigned, transferred, pledged or otherwise encumbered by the Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the lifetime of the Participant, this option shall be exercisable only by the Participant.

5. Provisions of the Plan .

This option is subject to the provisions of the Plan (including the provisions relating to amendments to the Plan), a copy of which is furnished to the Participant with this option.

6. Data Privacy Consent .

In order to administer the Plan and this Agreement and to implement or structure future equity grants, the Company, its subsidiaries and affiliates and certain agents thereof (together, the "Relevant Companies") may process any and all personal or professional data, including but not limited to Social Security or other identification number, home address and telephone number, date of birth and other information that is necessary or desirable for the administration of the Plan and/or this Agreement (the "Relevant Information"). By entering into this Agreement, the Participant (i) authorizes the Company to collect, process, register and transfer to the Relevant Companies all Relevant Information; (ii) waives any privacy rights the Participant may have with respect to the Relevant Information; (iii) authorizes the Relevant Companies to store and transmit such information in electronic form; and (iv) authorizes the transfer of the Relevant Information to any jurisdiction in which the Relevant Companies consider appropriate. The Participant shall have access to, and the right to change, the Relevant Information. Relevant Information will only be used in accordance with applicable law.

IN WITNESS WHEREOF, the Company has caused this option to be executed under its corporate seal by its duly authorized officer. This option shall take effect as a sealed instrument.

ALNYLAM PHARMACEUTICALS, INC.

By: _____

Name: _____
Title: _____

PARTICIPANT'S ACCEPTANCE

The undersigned hereby accepts the foregoing option and agrees to the terms and conditions thereof. Electronic acceptance of this Agreement pursuant to the Company's instructions for the Participant (including through an online acceptance process) is acceptable. The undersigned hereby acknowledges receipt of a copy of the Company's Second Amended and Restated 2009 Stock Incentive Plan.

PARTICIPANT:

_____

Address: _____

_____

ALNYLAM PHARMACEUTICALS, INC.

Restricted Stock Agreement

Name of Participant: _____

Number of shares of restricted common stock awarded: _____

Grant Date: _____

Alnylam Pharmaceuticals, Inc. (the "Company") has selected you to receive the restricted stock award described above, which is subject to the provisions of the Company's Second Amended and Restated 2009 Stock Incentive Plan (the "Plan") and the terms and conditions contained in this Restricted Stock Agreement. Electronic acceptance of this Agreement pursuant to the Company's instructions (including through an online acceptance process) is acceptable. Please confirm your acceptance of this restricted stock award and of the terms and conditions of this Agreement by signing a copy of this Agreement where indicated below.

ALNYLAM PHARMACEUTICALS, INC.

By:_____
[insert name and title **]**

Accepted and Agreed:

_____
[insert name of Participant **]**

ALNYLAM PHARMACEUTICALS, INC.

Restricted Stock Agreement

The terms and conditions of the award of shares of restricted common stock of the Company (the "Restricted Shares") made to the Participant, as set forth on the cover page of this Agreement, are as follows:

1. Issuance of Restricted Shares .

(a) The Restricted Shares are issued to the Participant, effective as of the Grant Date (as set forth on the cover page of this Agreement), in consideration of employment or other services rendered and to be rendered by the Participant to the Company.

(b) The Restricted Shares will initially be issued by the Company in book entry form only, in the name of the Participant. Following the vesting of any Restricted Shares pursuant to Section 2 below, the Company shall, if requested by the Participant, issue and deliver to the Participant a certificate representing the vested Restricted Shares. The Participant agrees that the Restricted Shares shall be subject to the forfeiture provisions set forth in Section 3 of this Agreement and the restrictions on transfer set forth in Section 4 of this Agreement.

2. Vesting .

(a) Vesting Schedule . Unless otherwise provided in this Agreement or the Plan, the Restricted Shares shall vest in accordance with the following vesting schedule: [ ]% of the total number of Restricted Shares shall vest on the first anniversary of the Grant Date and [ ]% of the total number of Restricted Shares shall vest at the end of each successive [ ] period following the first anniversary of the Grant Date, through and including the [ ] anniversary of the Grant Date. Any fractional number of Restricted Shares resulting from the application of the foregoing percentages shall be rounded down to the nearest whole number of Restricted Shares.

(b) Acceleration of Vesting . Notwithstanding the foregoing vesting schedule, all unvested Restricted Shares shall vest effective (i) immediately prior to a Reorganization Event involving the liquidation or dissolution of the Company (as defined in the Plan), and (ii) immediately upon the Participant's death if the Participant dies while he or she is an employee or officer of, or consultant or advisor to, the Company or any Subsidiary (an "Eligible Participant").

3. Forfeiture of Unvested Restricted Shares Upon Termination of Relationship with the Company .

In the event that the Participant ceases to be an Eligible Participant for any reason or no reason, with or without cause, all of the Restricted Shares that are unvested as of the time of such termination from the Company, as well as any Accrued Dividends (as defined below) declared by the Company with respect to such unvested Restricted Shares, shall be forfeited immediately and automatically to the Company, without the payment of any consideration to the Participant, effective as of such termination of service. The Participant hereby authorizes the Company to take any actions necessary or appropriate to cancel any certificate(s) representing forfeited

Restricted Shares and transfer ownership of such forfeited Restricted Shares to the Company; and if the Company or its transfer agent requires an executed stock power or similar confirmatory instrument in connection with such cancellation and transfer, the Participant shall promptly execute and deliver the same to the Company. The Participant shall have no further rights with respect to any Restricted Shares, or any Accrued Dividends with respect to such Restricted Shares, that are so forfeited. If the Participant is employed by or provides services to a subsidiary of the Company, any references in this Agreement to employment or services with the Company shall instead be deemed to refer to employment or service with such subsidiary.

4. Restrictions on Transfer .

The Participant shall not sell, assign, transfer, pledge, hypothecate or otherwise dispose of, by operation of law or otherwise (collectively "transfer") any Restricted Shares, or any interest therein, until such Restricted Shares have vested, except that the Participant may transfer such Restricted Shares: (a) to or for the benefit of any spouse, children, parents, uncles, aunts, siblings, grandchildren and any other relatives approved by the Compensation Committee (collectively, "Approved Relatives") or to a trust established solely for the benefit of the Participant and/or Approved Relatives, provided that such Restricted Shares shall remain subject to this Agreement (including without limitation the forfeiture provisions set forth in Section 3 and the restrictions on transfer set forth in this Section 4) and such permitted transferee shall, as a condition to such transfer, deliver to the Company a written instrument confirming that such transferee shall be bound by all of the terms and conditions of this Agreement; or (b) as part of the sale of all or substantially all of the shares of capital stock of the Company (including pursuant to a merger or consolidation). The Company shall not be required (i) to transfer on its books any of the Restricted Shares which have been transferred in violation of any of the provisions of this Agreement or (ii) to treat as owner of such Restricted Shares or to pay dividends to any transferee to whom such Restricted Shares have been transferred in violation of any of the provisions of this Agreement.

5. Restrictive Legends .

The book entry account reflecting the issuance of the Restricted Shares in the name of the Participant shall bear a legend or other notation upon substantially the following terms:

"These shares of stock are subject to forfeiture provisions and restrictions on transfer set forth in a certain Restricted Stock Agreement between the corporation and the registered owner of these shares (or his or her predecessor in interest), and such Agreement is available for inspection without charge at the office of the Secretary of the corporation."

6. Rights as a Shareholder .

Except as otherwise provided in this Agreement, for so long as the Participant is the registered owner of the Restricted Shares, the Participant shall have all rights as a shareholder with respect to the Restricted Shares, whether vested or unvested, including, without limitation, any rights to receive dividends and distributions with respect to the Restricted Shares and to vote the Restricted Shares and act in respect of the Restricted Shares at any meeting of shareholders. Notwithstanding the foregoing, any dividends, whether in cash, stock or property, declared and paid by the Company with respect to unvested Restricted Shares ("Accrued Dividends") shall be paid to the Participant, without interest, only if and when such Restricted Shares vest.

7. Provisions of the Plan .

This Agreement is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this Agreement.

8. Tax Matters .

(a) Acknowledgments; Section 83(b) Election . The Participant acknowledges that he or she is responsible for obtaining the advice of the Participant's own tax advisors with respect to the acquisition of the Restricted Shares and the Participant is relying solely on such advisors and not on any statements or representations of the Company or any of its agents with respect to the tax consequences relating to the Restricted Shares. The Participant understands that the Participant (and not the Company) shall be responsible for the Participant's tax liability that may arise in connection with the acquisition, vesting and/or disposition of the Restricted Shares and any Accrued Dividends with respect to such Restricted Shares. The Participant acknowledges that he or she has been informed of the availability of making an election under Section 83(b) of the Internal Revenue Code, as amended, with respect to the issuance of the Restricted Shares and that the Participant has decided not to file a Section 83(b) election.

(b) Withholding . The Participant acknowledges and agrees that the Company has the right to deduct from payments of any kind otherwise due to the Participant any federal, state, local or other taxes of any kind required by law to be withheld with respect to the vesting of the Restricted Shares. On each date on which Restricted Shares vest, the Company shall deliver written notice to the Participant of the amount of withholding taxes due with respect to the vesting of the Restricted Shares that vest on such date; provided, however, that the total tax withholding cannot exceed the Company's minimum statutory withholding obligations (based on minimum statutory withholding rates for federal and state tax purposes, including payroll taxes, that are applicable to such supplemental taxable income), unless withholding at a higher rate would not result in adverse accounting treatment (in which case such withholding shall not exceed maximum statutory withholding rates). The Participant shall satisfy such tax withholding obligations by transferring to the Company, on each date on which Restricted Shares vest under this Agreement, such number of Restricted Shares that vest on such date as have a fair market value (calculated using the last reported sale price of the common stock of the Company on the NASDAQ National Market on the trading date immediately prior to such vesting date) equal to the amount of the Company's tax withholding obligation in connection with the vesting of such Restricted Shares. Such delivery of Restricted Shares to the Company shall be deemed to happen automatically, without any action required on the part of the Participant, and the Company is hereby authorized to take such actions as are necessary to effect such delivery.

9. Data Privacy Consent .

In order to administer the Plan and this Agreement and to implement or structure future equity grants, the Company, its subsidiaries and affiliates and certain agents thereof (together, the "Relevant Companies") may process any and all personal or professional data, including but not limited to Social Security or other identification number, home address and telephone number, date of birth and other information that is necessary or desirable for the administration of the Plan and/or this Agreement (the "Relevant Information"). By entering into this

Agreement, the Participant (i) authorizes the Company to collect, process, register and transfer to the Relevant Companies all Relevant Information; (ii) waives any privacy rights the Participant may have with respect to the Relevant Information; (iii) authorizes the Relevant Companies to store and transmit such information in electronic form; and (iv) authorizes the transfer of the Relevant Information to any jurisdiction in which the Relevant Companies consider appropriate. The Participant shall have access to, and the right to change, the Relevant Information. Relevant Information will only be used in accordance with applicable law.

10. Miscellaneous .

(a) Authority of Compensation Committee . In making any decisions or taking any actions with respect to the matters covered by this Agreement, the Compensation Committee shall have all of the authority and discretion, and shall be subject to all of the protections, provided for in the Plan. All decisions and actions by the Compensation Committee with respect to this Agreement shall be made in the Compensation Committee's discretion and shall be final and binding on the Participant.

(b) No Right to Continued Service Relationship . The Participant acknowledges and agrees that, notwithstanding the fact that the vesting of the Restricted Shares is contingent upon his or her continued employment by or service to the Company, this Agreement does not constitute an express or implied promise of continued employment or service or confer upon the Participant any rights with respect to continued employment by or service to the Company.

(c) Governing Law . This Agreement shall be construed, interpreted and enforced in accordance with the internal laws of the State of Delaware without regard to any applicable conflicts of laws provisions.

(d) Participant's Acknowledgments . The Participant acknowledges that he or she has read this Agreement, has received and read the Plan, and understands the terms and conditions of this Agreement and the Plan.

ALNYLAM PHARMACEUTICALS, INC.

Restricted Stock Unit Award Agreement
Granted Under Second Amended And Restated 2009 Stock Incentive Plan

Name of Grantee: _____

No. of Restricted Stock Units _____

Grant Date: _____

Pursuant to the Alnylam Pharmaceuticals, Inc. Second Amended and Restated 2009 Stock Incentive Plan as amended through the date hereof (the "Plan"), Alnylam Pharmaceuticals, Inc (the "Company") hereby grants an award of the number of Restricted Stock Units listed above (an "Award") to the Grantee named above. Each Restricted Stock Unit shall relate to one share of Common Stock, par value $0.01 per share (the "Stock") of the Company.

1. Restrictions on Transfer of Award . This Award may not be sold, transferred, pledged, assigned or otherwise encumbered or disposed of by the Grantee, and any shares of Stock issuable with respect to the Award may not be sold, transferred, pledged, assigned or otherwise encumbered or disposed of until (i) the Restricted Stock Units have vested as provided in Paragraph 2 of this Agreement and (ii) shares of Stock have been issued to the Grantee in accordance with the terms of the Plan and this Agreement.

2. Vesting of Restricted Stock Units . The restrictions and conditions of Paragraph 1 of this Agreement shall lapse on the Vesting Date or Dates specified in the following schedule so long as the Grantee remains an employee or officer of, or consultant or advisor to, the Company or a Subsidiary (an "Eligible Participant") on such Dates. If a series of Vesting Dates is specified, then the restrictions and conditions in Paragraph 1 shall lapse only with respect to the number of Restricted Stock Units specified as vested on such date.

Incremental Number of Restricted Stock Units Vested	Vesting Date
_____ (____%)	_____
_____ (____%)	_____
_____ (____%)	_____
_____ (____%)	_____

Notwithstanding the foregoing, this award will become fully vested in the event the Grantee dies while he or she is an Eligible Participant prior to the Final Vesting Date.

The Administrator may at any time accelerate the vesting schedule specified in this Paragraph 2.

3. Termination of Relationship with the Company . If the Grantee ceases to be an Eligible Participant for any reason other than death prior to the satisfaction of the vesting conditions set forth in Paragraph 2 above, any Restricted Stock Units that have not vested as of such date shall automatically and without notice terminate and be forfeited, and neither the Grantee nor any of his or her successors, heirs, assigns, or personal representatives will thereafter have any further rights or interests in such unvested Restricted Stock Units.

4. Issuance of Shares of Stock . As soon as practicable following each Vesting Date (but in no event later than two and one-half months after the end of the year in which the Vesting Date occurs), the Company shall issue to the Grantee the number of shares of Stock equal to the aggregate number of Restricted Stock Units that have vested pursuant to Paragraph 2 of this Agreement on such date and the Grantee shall thereafter have all the rights of a stockholder of the Company with respect to such shares.

5. Incorporation of Plan . Notwithstanding anything herein to the contrary, this Agreement shall be subject to and governed by all the terms and conditions of the Plan, including the powers of the Administrator set forth in Section 2(b) of the Plan. Capitalized terms in this Agreement shall have the meaning specified in the Plan, unless a different meaning is specified herein.

6. Tax Withholding . The Grantee shall, not later than the date as of which the receipt of this Award becomes a taxable event for Federal income tax purposes, pay to the Company or make arrangements satisfactory to the Administrator for payment of any Federal, state, and local taxes required by law to be withheld on account of such taxable event. The Company shall have the authority to cause the required tax withholding obligation to be satisfied, in whole or in part, by (i) withholding from shares of Stock to be issued to the Grantee a number of shares of Stock with an aggregate Fair Market Value that would satisfy the withholding amount due or (ii) requiring the Grantee to sell sufficient shares to cover the withholding amount.

7. Section 409A of the Code. This Agreement shall be interpreted in such a manner that all provisions relating to the settlement of the Award are exempt from the requirements of Section 409A of the Code as "short-term deferrals" as described in Section 409A of the Code.

8. No Obligation to Continue Service Relationship . Neither the Company nor any Subsidiary is obligated by or as a result of the Plan or this Agreement to continue the Grantee in employment or other service relationship and neither the Plan nor this Agreement shall interfere in any way with the right of the Company or any Subsidiary to terminate the employment or other service relationship of the Grantee at any time.

9. Integration . This Agreement constitutes the entire agreement between the parties with respect to this Award and supersedes all prior agreements and discussions between the parties concerning such subject matter.

10. Data Privacy Consent . In order to administer the Plan and this Agreement and to implement or structure future equity grants, the Company, its subsidiaries and affiliates and certain agents thereof (together, the "Relevant Companies") may process any and all personal or professional data, including but not limited to Social Security or other identification number,

home address and telephone number, date of birth and other information that is necessary or desirable for the administration of the Plan and/or this Agreement (the "Relevant Information"). By entering into this Agreement, the Grantee (i) authorizes the Company to collect, process, register and transfer to the Relevant Companies all Relevant Information; (ii) waives any privacy rights the Grantee may have with respect to the Relevant Information; (iii) authorizes the Relevant Companies to store and transmit such information in electronic form; and (iv) authorizes the transfer of the Relevant Information to any jurisdiction in which the Relevant Companies consider appropriate. The Grantee shall have access to, and the right to change, the Relevant Information. Relevant Information will only be used in accordance with applicable law.

11. Notices . Notices hereunder shall be mailed or delivered to the Company at its principal place of business and shall be mailed or delivered to the Grantee at the address on file with the Company or, in either case, at such other address as one party may subsequently furnish to the other party in writing.

ALNYLAM PHARMACEUTICALS, INC

By: _____

Title:

The foregoing Agreement is hereby accepted and the terms and conditions thereof hereby agreed to by the undersigned. Electronic acceptance of this Agreement pursuant to the Company's instructions to the Grantee (including through an online acceptance process) is acceptable.

Dated: _____ _____

Grantee's Signature

Grantee's name and address:

Exhibit 10.3

ALNYLAM PHARMACEUTICALS, INC.

AMENDED AND RESTATED 2004 EMPLOYEE STOCK PURCHASE PLAN

The purpose of this Plan is to provide eligible employees of Alnylam Pharmaceuticals, Inc., a Delaware corporation (the "Company"), and certain of its subsidiaries with opportunities to purchase shares of the Company's common stock, $0.01 par value (the "Common Stock"). An aggregate of 1,215,789 shares of Common Stock have been approved for this purpose. This Plan is intended to qualify as an "employee stock purchase plan" as defined in Section 423 of the Internal Revenue Code of 1986, as amended (the "Code"), and the regulations promulgated thereunder, and shall be interpreted consistent therewith.

1. Administration . The Plan will be administered by the Company's Board of Directors (the "Board") or by a Committee appointed by the Board (the "Committee"). The Board or the Committee has authority to make rules and regulations for the administration of the Plan and its interpretation and decisions with regard thereto shall be final and conclusive.

2. Eligibility . All employees of the Company and all employees of any subsidiary of the Company (as defined in Section 424(f) of the Code) designated by the Board or the Committee from time to time (a "Designated Subsidiary"), are eligible to participate in any one or more of the offerings of Options (as defined in Section 9) to purchase Common Stock under the Plan provided that:

(a) are customarily employed by the Company or a Designated Subsidiary for more than twenty (20) hours a week and for more than five (5) months in a calendar year; and

(b) they have been employed by the Company or a Designated Subsidiary for at least thirty (30) days prior to enrolling in the Plan;

(c) they are employees of the Company or a Designated Subsidiary on the first day of the applicable Plan Period (as defined below); and

(d) in the case of an executive officer of the Company or a Designated Subsidiary, they are not considered a "highly compensated individual" within the meaning of Section 414(q) of the Code.

No employee may be granted an option hereunder if such employee, immediately after the option is granted, owns 5% or more of the total combined voting power or value of the stock of the Company or any subsidiary. For purposes of the preceding sentence, the attribution rules of Section 424(d) of the Code shall apply in determining the stock ownership of an employee, and all stock which the employee has a contractual right to purchase shall be treated as stock owned by the employee.

3. Offerings . The Company will make one or more offerings ("Offerings") to employees to purchase stock under this Plan. Offerings will begin each November 1 or the first business day thereafter (the "Offering Commencement Dates"). Each Offering Commencement Date will begin a twelve-month period (a "Plan Period") during which payroll deductions will be made and held for the purchase of Common Stock at the end of the Plan Period. The Board or the Committee may, at its discretion, choose a different Plan Period of twelve (12) months or less for subsequent Offerings. Notwithstanding anything to the contrary, the first Plan Period shall begin on the later of November 1, 2004 or the first date that the Common Stock is publicly traded following the Company's IPO (the "IPO Date"), and shall end on October 31, 2005.

4. Participation . An employee eligible on the Offering Commencement Date of any Offering may participate in such Offering by completing and forwarding a payroll deduction authorization form to the employee's appropriate payroll office at least five (5) business days prior to the applicable Offering Commencement Date. The form will authorize a regular payroll deduction from the Compensation received by the employee during the Plan Period. Unless an employee files a new form or withdraws from the Plan, his deductions and purchases will continue at the same rate for future Offerings under the Plan as long as the Plan remains in effect. The term "Compensation" means the amount of money reportable on the employee's Federal Income Tax Withholding Statement, excluding overtime, shift premium, incentive or bonus awards, allowances and reimbursements for expenses such as relocation allowances for travel expenses, income or gains on the exercise of Company stock options or stock appreciation rights, amounts imputed in respect of benefit programs and similar items, whether or not shown on the employee's Federal Income Tax Withholding Statement, but including, in the case of salespersons, sales commissions to the extent determined by the Board or the Committee.

5. Deductions . The Company will maintain payroll deduction accounts for all participating employees. With respect to any Offering made under this Plan, an employee may authorize a payroll deduction in any dollar amount up to a maximum of 15% of the Compensation he or she receives during the Plan Period or such shorter period during which deductions from payroll are made. Payroll deductions may be at the rate of 1%, 2%, 3%, 4%, 5%, 6%, 7%, 8%, 9%, 10%, 11%, 12%, 13%, 14% or 15% of Compensation with any change in compensation during the Plan Period to result in an automatic corresponding change in the dollar amount withheld. The minimum payroll deduction is such percentage of compensation as may be established from time to time by the Board or the Committee.

6. Deduction Changes . An employee may decrease or discontinue his payroll deduction once during any Plan Period, by filing a new payroll deduction authorization form. However, an employee may not increase his payroll deduction during a Plan Period. If an employee elects to discontinue his payroll deductions during a Plan Period, but does not elect to withdraw his funds pursuant to Section 8 hereof, funds deducted prior to his election to discontinue will be applied to the purchase of Common Stock on the Exercise Date (as defined below).

7. Interest . Interest will not be paid on any employee accounts.

8. Withdrawal of Funds . An employee may at any time prior to the close of business on the last business day in a Plan Period and for any reason permanently draw out the balance accumulated in the employee's account and thereby withdraw from participation in an Offering. Partial withdrawals are not permitted. The employee may not begin participation again during the remainder of the Plan Period. The employee may participate in any subsequent Offering in accordance with terms and conditions established by the Board or the Committee.

9. Purchase of Shares . On the Offering Commencement Date of each Plan Period, the Company will grant to each eligible employee who is then a participant in the Plan an option ("Option") to purchase on the last business day of such Plan Period (the "Exercise Date"), at the Option Price hereinafter provided for, the largest number of whole shares of Common Stock of the Company as does not exceed the number of shares determined by dividing $25,000 by the closing price (as defined below) on the Offering Commencement Date of such Plan Period.

Notwithstanding the above, no employee may be granted an Option which permits his rights to purchase Common Stock under this Plan and any other employee stock purchase plan (as defined in Section 423(b) of the Code) of the Company and its subsidiaries, to accrue at a rate which exceeds $25,000 of the fair market value of such Common Stock (determined at the Offering Commencement Date of the Plan Period) for each calendar year in which the Option is outstanding at any time.

The purchase price for each share purchased will be 85% of the closing price of the Common Stock on (i) the Offering Commencement Date of such Plan Period or (ii) the Exercise Date, whichever closing price shall be less. Such closing price shall be (a) the closing price on any national securities exchange on which the Common Stock is listed, (b) the closing price of the Common Stock on the NASDAQ Stock Market or (c) the average of the closing bid and asked prices in the over-the-counter-market, whichever is applicable, as published in The Wall Street Journal ; provided that, with respect to the first Plan Period, if the first day of such Plan Period is the IPO Date, the closing price of the Common Stock on the first business day of such Plan Period shall be deemed to be the initial public offering price for the Common Stock, as set forth in the final prospectus relating to the IPO. If no sales of Common Stock were made on such a day, the price of the Common Stock for purposes of clauses (a) and (b) above shall be the reported price for the next preceding day on which sales were made.

Each employee who continues to be a participant in the Plan on the Exercise Date shall be deemed to have exercised his Option at the Option Price on such date and shall be deemed to have purchased from the Company the number of full shares of Common Stock reserved for the purpose of the Plan that his accumulated payroll deductions on such date will pay for, but not in excess of the maximum number determined in the manner set forth above.

Any balance remaining in an employee's payroll deduction account at the end of a Plan Period will be automatically refunded to the employee, except that any balance which is less than the purchase price of one share of Common Stock will be carried forward into the employee's payroll deduction account for the following Offering, unless the employee elects not to participate in the following Offering under the Plan, in which case the balance in the employee's account shall be refunded.

10. Issuance of Certificates . Certificates representing shares of Common Stock purchased under the Plan may be issued only in the name of the employee, in the name of the employee and another person of legal age as joint tenants with rights of survivorship, or (in the Company's sole discretion) in the name of a brokerage firm, bank or other nominee holder designated by the employee. The Company may, in its sole discretion and in compliance with applicable laws, authorize the use of book entry registration of shares in lieu of issuing stock certificates.

11. Rights on Retirement, Death or Termination of Employment . In the event of a participating employee's termination of employment prior to the last business day of a Plan Period, no payroll deduction shall be taken from any pay due and owing to an employee and the balance in the employee's account shall be paid to the employee or, in the event of the employee's death, (a) to a beneficiary previously designated in a revocable notice signed by the employee (with any spousal consent required under state law) or (b) in the absence of such a designated beneficiary, to the executor or administrator of the employee's estate or (c) if no such executor or administrator has been appointed to the knowledge of the Company, to such other person(s) as the Company may, in its discretion, designate. If, prior to the last business day of the Plan Period, the Designated Subsidiary by which an employee is employed shall cease to be a subsidiary of the Company, or if the employee is transferred to a subsidiary of the Company that is not a Designated Subsidiary, the employee shall be deemed to have terminated employment for the purposes of this Plan.

12. Optionees Not Stockholders . Neither the granting of an Option to an employee nor the deductions from his pay shall constitute such employee a stockholder of the shares of Common Stock covered by an Option under this Plan until such shares have been purchased by and issued to him.

13. Rights Not Transferable . Rights under this Plan are not transferable by a participating employee other than by will or the laws of descent and distribution, and are exercisable during the employee's lifetime only by the employee.

14. Application of Funds . All funds received or held by the Company under this Plan may be combined with other corporate funds and may be used for any corporate purpose.

15. Adjustment in Case of Changes Affecting Common Stock . In the event of a subdivision of outstanding shares of Common Stock, or the payment of a dividend in Common Stock, the number of shares approved for this Plan, and the share limitation set forth in Section 9, shall be increased proportionately, and such other adjustment shall be made as may be deemed equitable by the Board or the Committee. In the event of any other change affecting the Common Stock, such adjustment shall be made as may be deemed equitable by the Board or the Committee to give proper effect to such event.

16. Merger . If the Company shall at any time merge or consolidate with another corporation and the holders of the capital stock of the Company immediately prior to such merger or consolidation continue to hold at least a majority by voting power of the capital stock of the surviving corporation ("Continuity of Control"), the holder of each Option then outstanding will thereafter be entitled to receive at the next Exercise Date upon the exercise of such Option for each share as to which such Option shall be exercised the securities or property which a holder of one share of the Common Stock was entitled to upon and at the time of such merger or consolidation, and the Board or the Committee shall take such steps in connection with such merger or consolidation as the Board or the Committee shall deem necessary to assure that the provisions of Section 15 shall thereafter be applicable, as nearly as reasonably may be, in relation to the said securities or property as to which such holder of such Option might thereafter be entitled to receive thereunder.

In the event of a merger or consolidation of the Company with or into another corporation which does not involve Continuity of Control, or of a sale of all or substantially all of the assets of the Company while unexercised Options remain outstanding under the Plan,

(a) subject to the provisions of clauses (b) and (c), after the effective date of such transaction, each holder of an outstanding Option shall be entitled, upon exercise of such Option, to receive in lieu of shares of Common Stock, shares of such stock or other securities as the holders of shares of Common Stock received pursuant to the terms of such transaction; or (b) all outstanding Options may be cancelled by the Board or the Committee as of a date prior to the effective date of any such transaction and all payroll deductions shall be paid out to the participating employees; or (c) all outstanding Options may be cancelled by the Board or the Committee as of the effective date of any such transaction, provided that notice of such cancellation shall be given to each holder of an Option, and each holder of an Option shall have the right to exercise such Option in full based on payroll deductions then credited to his account as of a date determined by the Board or the Committee, which date shall not be less than ten (10) days preceding the effective date of such transaction.

17. Amendment of the Plan . The Board may at any time, and from time to time, amend this Plan in any respect, except that (a) if the approval of any such amendment by the shareholders of the Company is required by Section 423 of the Code, such amendment shall not be effected without such approval, and (b) in no event may any amendment be made which would cause the Plan to fail to comply with Section 423 of the Code.

18. Insufficient Shares . In the event that the total number of shares of Common Stock specified in elections to be purchased under any Offering plus the number of shares purchased under previous Offerings under this Plan exceeds the maximum number of shares issuable under this Plan, the Board or the Committee will allot the shares then available on a pro rata basis.

19. Termination of the Plan . This Plan may be terminated at any time by the Board. Upon termination of this Plan all amounts in the accounts of participating employees shall be promptly refunded.

20. Governmental Regulations . The Company's obligation to sell and deliver Common Stock under this Plan is subject to listing on a national stock exchange or quotation on the NASDAQ (to the extent the

Common Stock is then so listed or quoted) and the approval of all governmental authorities required in connection with the authorization, issuance or sale of such stock.

21. Governing Law . The Plan shall be governed by Delaware law except to the extent that such law is preempted by federal law.

22. Issuance of Shares . Shares may be issued upon exercise of an Option from authorized but unissued Common Stock, from shares held in the treasury of the Company, or from any other proper source.

23. Notification upon Sale of Shares . Each employee agrees, by entering the Plan, to promptly give the Company notice of any disposition of shares purchased under the Plan where such disposition occurs within two (2) years after the date of grant of the Option pursuant to which such shares were purchased.

24. Special Provisions for First Plan Period . If the first day of the first Plan Period is the IPO Date, the following provisions of this Section 24 shall apply with respect to the first Plan Period notwithstanding any provision of the Plan to the contrary:

(a) Every eligible employee shall automatically become a participant in the Plan for the first Plan Period at the highest percentage of Compensation permitted under Section 5. No payroll deductions shall be required for the first Plan Period; however, a participant may, at any time after the effectiveness of the Plan's Registration Statement on Form S-8, elect to have payroll deductions up to the aggregate amount which would have been credited to his or her account if a deduction of fifteen percent (15%) of the Compensation which he or she received on each pay day during the first Plan Period had been made (the "Maximum Amount") or decline to participate by filing an appropriate subscription agreement.

(b) Upon the automatic exercise of a participant's option on the Exercise Date for the first Plan Period, a participant shall be permitted to purchase shares with (i) the accumulated payroll deductions in his or her account, if any, (ii) a direct payment from the participant, or (iii) a combination thereof; provided, however that the total amount applied to the purchase may not exceed the Maximum Amount.

25. Withholding . Each employee shall, no later than the date of the event creating the tax liability, make provision satisfactory to the Board for payment of any taxes required by law to be withheld in connection with any transaction related to Options granted to or shares acquired by such employee pursuant to the Plan. The Company may, to the extent permitted by law, deduct any such taxes from any payment of any kind otherwise due to an employee.

26. Effective Date and Approval of Shareholders . The Plan originally took effect on the IPO Date. The Board amended and restated the Plan on March 6, 2017. The amended and restated Plan shall, in accordance with applicable law, the Company's by-laws and certificate of incorporation, become effective upon approval by the shareholders of the Company as required by Section 423 of the Code, which approval must occur within twelve months of the amendment and restatement of the Plan by the Board.

April 18, 2017

Manmeet Soni
90 Wayne Road
Newton, MA 02459

Dear Manmeet:

I am pleased to offer you the position of Senior Vice President, Chief Financial Officer with Alnylam Pharmaceuticals, Inc. reporting to John M. Maraganore, Chief Executive Officer.

Base Salary

You will receive a bi-weekly salary of $18,846.16, equivalent to $490,000.16 annually. Alnylam currently has 26 pay periods annually with payments on Fridays or on the preceding day in the event of a holiday. This position is exempt, and thus not eligible for overtime pay.

Alnylam conducts an annual performance and merit review process. You will be eligible for a performance and a pro-rated merit review next year if your employment begins on or before October 1 st of this year. If your employment date falls between October 2 nd and December 31 st , you will become eligible for review in January of the following calendar year. Notwithstanding the foregoing, the Executive Compensation review will occur in the fourth quarter of 2017 or the first quarter of 2018 to ensure competitive compensation positioning.

Discretionary Sign-On Bonus

You will receive an initial sign-on bonus of $100,000.00 (the "Initial Bonus") on the first regularly scheduled pay period following your first 30 days of employment and an additional $50,000.00 bonus (the "Subsequent Bonus") on the first regularly scheduled pay period following the one-year anniversary of your employment start date. In the event you voluntarily terminate your employment with Alnylam or you are terminated by Alnylam for Cause, within twelve (12) months of the (i) the Intial Bonus or (ii) the Subsequent Bonus, you will be required to repay the full gross amount of either the Intial Bonus (if you leave within the first twelve (12) months), or the Subsequent Bonus, if you leave within months twelve (12) through twenty-four (24). Any such repayment will be required within 30 days following your last day of employment with Alnylam and you agree that any such repayment amount may be deducted from monies owed to you by the Company, including your last regular paycheck or any discretionary bonus payments due.

For purposes of this agreement "Cause" shall mean your substantial and continuing failure to perform your assigned duties (other than any such failure resulting from incapacity due to injury or physical or mental illness), which failure is not cured within 30 days after a written demand for substantial performance is delivered to you by the Company and you have had a reasonable opportunity, after receipt of such written

demand, to be heard, or your conviction of a felony (other than unintentional motor vehicle felonies), or your engaging in gross misconduct which is materially and demonstrably injurious to the Company.

Annual Incentive Program

You will be eligible to participate in Alnylam's Annual Incentive Program consistent with incentive plan guidelines adopted by the Compensation Committee for 2017. Your incentive target will be 40% of your annual base salary and is subject to achievement of Company and individual performance goals. You will be eligible for a pro-rated bonus if your employment date occurs on or before October 1 st of this year.

Equity Awards

You will be granted a non-qualified stock option to purchase 125,000 shares of the Company's common stock on your first day of employment. The stock option will be made as inducement grant under NASDAQ Stock Market Rule 5635(c)(4). The exercise price shall be equal to the closing price of the common stock on the date of grant. The option will vest over four years at the rate of 25% after twelve months of full time active employment and then an additional 6.25% for each additional quarter of full time active employment until the fourth anniversary of the grant date, when the option will be fully vested.

You will also be granted an additional non-qualified stock option to purchase 25,000 shares of the Company's common stock on your first day of employment, subject to the same terms as the option described above, with the exception of vesting, which shall be performance-based rather than time-based. The additional option shall vest upon the later of the one year anniversary of the date of grant and the launch of the Company's first internally developed product; provided that any determination as to whether or not such vesting event has been met shall be made in the sole discretion of the Company's Compensation Committee and such date of vesting shall be the date so determined by the Committee.

Benefits

As a regular full time employee, you will be eligible to participate in the Company's comprehensive benefits program upon hire. Please see the enclosed Benefit Highlights and 2017 Benefit Guide summary for details. Alnylam retains the right to modify or cancel any benefits programs.

Business expenses

All reasonable business-related expenses are reimbursed (including phone, Internet, car service, IPad and business-related travel) in accordance with the Company's travel and expense policy in effect from time to time.

Termination

While we do not have a formal severance plan nor a Change of Control plan, we would however follow past practice of providing severance, subject to Compensation Committee approval, provided any such termination is not for Cause.

Relocation

In addition, you will be reimbursed for reasonable relocation expenses as follows:

• **Temporary housing** . Temporary housing, if needed, will be reimbursed for up to three (3) months at $7,500 per month. You will be reimbursed on a monthly basis per receipt of a monthly invoice.

• **Reimbursement of Customary, Non-Recurring Home Purchase Closing Costs** . Alnylam will cover the closing costs related to home purchase, including mortgage origination fees up to 1% mortgage loan amount. Total costs shall not exceed 3% of the new mortgage loan amount. Points related to the mortgage interest rate are not covered.

• **Movement of house hold goods** . Our relocation provider MoveTrek, will provide the services related to the movement of household goods from your home rental to your permanent residence. This cost will be covered by Alnylam.

Any relocation expenses listed above that are subject to individual federal and/or state taxation will be adjusted so that any additional tax will be paid by Alnylam on your behalf.

Contingencies

This offer of employment is contingent upon completion of Alnylam's standard employment application, a satisfactory background screening and drug screening, reference check and your signed agreement to abide by all the terms and conditions of the Company's standard Employee Nondisclosure, Noncompetition and Assignment of Intellectual Property Agreement (copy attached). Until you have received confirmation from Alnylam that all the contingencies described have been met, we advise you not to resign from your current position.

Additionally, in accordance with US Immigration and Naturalization laws, our offer of employment is contingent upon your ability to provide proof of your identity and legal authorization to work in the United States. Please refer to the enclosed pre-approved document list and bring the appropriate documents with you on your first day of employment.

We are very excited about having you join our team and look forward to your many contributions to Alnylam's continued success!

Sincerely,

/s/ Karen Anderson

Karen Anderson
Chief Human Resources Officer

By signing below, the undersigned understands that this offer does not create an express or implied contract of employment for any definite period of time and further agrees that there have been no express or implied representations by Alnylam (or any individual speaking on behalf of Alnylam) regarding the employment offered, other than as set forth expressly herein or, to the extent applicable, as set forth expressly in Alnylam's employment application. By signing below, the undersigned also understands that the employment offered is "at will," meaning that it can be terminated by Alnylam or the employee at any time for any reason.

By signing below, the undersigned represents that his acceptance of employment with Alnylam does not conflict with any obligations of the undersigned to any third party, and the undersigned will not disclose or make available to Alnylam or use for Alnylam's benefit, any trade secrets or confidential information that is the property of any third party, including without limitation, any former employer, partner, client, customer or supplier. The undersigned represents that he has provided Alnylam with a copy of every agreement that may bear on the undersigned's employment with Alnylam, including any noncompetition or employment agreements, and that the undersigned will continue to honor any such agreements.

This offer will expire April 20, 2017.

Accepted By: **/s/ Manmeet Soni** **Date:** **APR 20, 2017**

Start Date: **Target: May 9, 2017**

EXHIBIT 31.1

CERTIFICATION

I, John M. Maraganore, Ph.D., certify that:

1) I have reviewed this Quarterly Report on Form 10-Q of Alnylam 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 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 and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 9, 2017

/s/ John M. Maraganore
John M. Maraganore, Ph.D.
Chief Executive Officer

EXHIBIT 31.2

CERTIFICATION

I, Manmeet S. Soni , certify that:

1) I have reviewed this Quarterly Report on Form 10-Q of Alnylam 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 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 and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 9, 2017

/s/ Manmeet S. Soni
Manmeet S. Soni
Senior Vice President, Chief Financial Officer

EXHIBIT 32.1

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report on Form 10-Q of Alnylam Pharmaceuticals, Inc. (the "Company") for the quarter ended June 30, 2017 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, John M. Maraganore, Ph.D., Chief Executive Officer of the Company, hereby certifies, pursuant to Section 1350 of Chapter 63 of Title 18, United States Code, that to his knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: August 9, 2017

/s/ John M. Maraganore
John M. Maraganore, Ph.D.
Chief Executive Officer

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

EXHIBIT 32.2

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report on Form 10-Q of Alnylam Pharmaceuticals, Inc. (the "Company") for the quarter ended June 30, 2017 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, Manmeet S. Soni , Senior Vice President, Chief Financial Officer , hereby certifies, pursuant to Section 1350 of Chapter 63 of Title 18, United States Code, that to his knowledge:

(1) the Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: August 9, 2017

/s/ Manmeet S. Soni
Manmeet S. Soni
Senior Vice President, Chief Financial Officer

A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.