

**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 September 30, 2020

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
(State or Other Jurisdiction of
Incorporation or Organization)

77-0602661
(I.R.S. Employer
Identification No.)

675 West Kendall Street,
Henri A. Termeer Square
Cambridge, MA
(Address of Principal Executive Offices)

02142
(Zip Code)

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

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

<u>Title of Each Class</u>	<u>Trading Symbol(s)</u>	<u>Name of Each Exchange on Which Registered</u>
Common Stock, \$0.01 par value per share	ALNY	The Nasdaq Stock Market LLC

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

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

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

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

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

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

At October 30, 2020, the registrant had 116,180,768 shares of Common Stock, \$0.01 par value per share, outstanding.

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“Alnylam,” ONPATTRO®, GIVLAARI®, Alnylam Act® and Alnylam Assist® are registered trademarks of Alnylam Pharmaceuticals, Inc. Our logo, trademarks and service marks are property of Alnylam. All other trademarks or service marks appearing in this Quarterly Report on Form 10-Q are the property of their respective holders.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Quarterly Report on Form 10-Q contains forward-looking statements within the meaning of the federal securities laws, Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. We intend these forward-looking statements to be covered by the safe harbor provisions for forward-looking statements contained in the Private Securities Litigation Reform Act of 1995 and are including this statement for purposes of complying with those safe harbor provisions. All statements other than statements of historical facts contained in this Quarterly Report on Form 10-Q are forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as “may,” “will,” “should,” “could,” “expects,” “plans,” “intends,” “anticipates,” “believes,” “estimates,” “predicts,” “potential,” “continue,” or the negative of these terms or other comparable terminology. These forward-looking statements include, but are not limited to, statements about:

- risks related to the direct or indirect impact of the COVID-19 global pandemic or any future pandemic, such as the scope and duration of the pandemic, government actions and restrictive measures implemented in response, material delays in diagnoses of rare diseases, initiation or continuation of treatment for diseases addressed by our products, or in patient enrollment in clinical trials, potential clinical trial, regulatory review and inspection or supply chain disruptions, and other potential impacts to our business, the effectiveness or timeliness of steps taken by us to mitigate the impact of this pandemic, and our ability to execute business continuity plans to address disruptions caused by the COVID-19 or any future pandemic;
- our views with respect to the potential for RNAi therapeutics, including ONPATTRO, GIVLAARI, lumasiran, patisiran, inclisiran, vutrisiran and fitusiran;
- our plans for additional global regulatory filings and the continuing product launches of ONPATTRO and GIVLAARI;
- our expectations regarding the advancement of lumasiran and inclisiran through regulatory review and toward the market;
- the progress of our research and development programs;
- our current and anticipated clinical trials and expectations regarding the reporting of data from these trials;
- our expectations regarding potential market size for, and the successful commercialization of, ONPATTRO, GIVLAARI or any future products, including lumasiran and inclisiran;
- the timing of regulatory filings and interactions with or actions or advice of regulatory authorities, which may affect the design, initiation, timing, continuation and/or progress of clinical trials or result in the need for additional pre-clinical and/or clinical testing or the timing or likelihood of regulatory approvals;
- our ability or, with respect to inclisiran, our partner’s ability, to obtain and maintain regulatory approval, pricing and reimbursement for ONPATTRO, GIVLAARI or any future products, including lumasiran and inclisiran;
- the status of our manufacturing operations and the construction of our manufacturing facility and any delays, interruptions or failures in the manufacture and supply of ONPATTRO, GIVLAARI, lumasiran, inclisiran, or any of our other product candidates by our contract manufacturers or by us;
- our progress continuing to build and leverage global commercial infrastructure;
- successfully launching, marketing and selling our approved products globally;
- our ability to successfully expand the indication for ONPATTRO in the future;
- the possible impact of any competing products on the commercial success of ONPATTRO and GIVLAARI and our product candidates, including lumasiran and inclisiran, and, our, or with respect to inclisiran, our partner's, ability to compete against such products;
- our ability to manage our growth and operating expenses;
- our expectations regarding our STAr pipeline growth strategy and our ability to meet or exceed our *Alnylam 2020* guidance for the advancement and commercialization of RNAi therapeutics;
- our belief that the funding provided by our strategic financing collaboration with The Blackstone Group Inc. and certain of its affiliates should enable us to achieve a self-sustainable profile without the need for future equity financing;
- our expectations regarding the length of time our current cash, cash equivalents and marketable securities will support our operations based on our current operating plan;
- our dependence on third parties for development, manufacture and distribution of products;

- our expectations regarding our corporate collaborations, including potential future licensing fees and milestone and royalty payments under existing or future agreements;
- obtaining, maintaining and protecting our intellectual property;
- our ability to attract and retain qualified key management and scientists, development, medical and commercial staff, consultants and advisors;
- the outcome of litigation or other legal proceedings;
- the risk of government investigations;
- regulatory developments in the United States, or U.S., and foreign countries;
- the impact of laws and regulations;
- developments relating to our competitors and our industry; and
- other risks and uncertainties, including those listed under the caption Part II, Item 1A, "Risk Factors" of this Quarterly Report on Form 10-Q.

The risks set forth above are not exhaustive. Other sections of this Quarterly Report on Form 10-Q may include additional factors that could adversely affect our business and financial performance. Moreover, we operate in a very competitive and rapidly changing environment. New risk factors emerge from time to time and it is not possible for management to predict all risk factors, nor can we assess the impact of all risk factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements. Any forward-looking statements in this Quarterly Report on Form 10-Q reflect our current views with respect to future events and with respect to our business and future financial performance, and involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by these forward-looking statements. Factors that may cause actual results to differ materially from current expectations include, among other things, those described under Part II, Item 1A, "Risk Factors" and elsewhere in this Quarterly Report on Form 10-Q. Given these uncertainties, you should not place undue reliance on these forward-looking statements. Except as required by law, we assume no obligation to update or revise these forward-looking statements for any reason, even if new information becomes available in the future. You are advised, however, to consult any further disclosure we make in our reports filed with the SEC.

This Quarterly Report on Form 10-Q may include data that we obtained from industry publications and third-party research, surveys and studies. Industry publications and third-party research, surveys and studies generally indicate that their information has been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. This Quarterly Report on Form 10-Q also may include data based on our own internal estimates and research, including estimates regarding the impact of the COVID-19 pandemic on our financial statements and business operations. Our internal estimates have not been verified by any independent source and, while we believe any data obtained from industry publications and third-party research, surveys and studies are reliable, we have not independently verified such data. Such third-party data, as well as our internal estimates and research, are subject to a high degree of uncertainty and risk due to a variety of factors, including those described in Part II, Item 1A, "Risk Factors" and elsewhere in this Quarterly Report on Form 10-Q. These and other factors could cause our results to differ materially from those expressed in this Quarterly Report on Form 10-Q.

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

	September 30, 2020	December 31, 2019
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 496,704	\$ 547,178
Marketable debt securities	1,279,955	975,017
Marketable equity securities	57,217	13,967
Accounts receivable, net	79,118	43,011
Inventory	66,942	56,348
Prepaid expenses and other current assets	74,766	80,343
Receivable related to the sale of future royalties	500,000	—
Total current assets	2,554,702	1,715,864
Property, plant and equipment, net	444,690	425,179
Operating lease right-of-use assets	245,234	221,197
Restricted investments	24,725	14,825
Other assets	37,932	18,069
Total assets	\$ 3,307,283	\$ 2,395,134
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 27,872	\$ 49,884
Accrued expenses	295,260	197,201
Operating lease liability	32,192	27,688
Deferred revenue	114,601	77,821
Liability related to the sale of future royalties	10,316	—
Total current liabilities	480,241	352,594
Operating lease liability, net of current portion	297,262	276,135
Deferred revenue, net of current portion	265,708	318,383
Liability related to the sale of future royalties, net of current portion	1,032,708	—
Other liabilities	16,341	9,330
Total liabilities	2,092,260	956,442
Commitments and contingencies (Note 14)		
Stockholders' equity:		
Preferred stock, \$0.01 par value per share, 5,000 shares authorized and no shares issued and outstanding as of September 30, 2020 and December 31, 2019	—	—
Common stock, \$0.01 par value per share, 250,000 shares authorized; 116,143 shares issued and outstanding as of September 30, 2020; 112,188 shares issued and outstanding as of December 31, 2019	1,161	1,122
Additional paid-in capital	5,592,884	5,201,176
Accumulated other comprehensive loss	(37,193)	(36,518)
Accumulated deficit	(4,341,829)	(3,727,088)
Total stockholders' equity	1,215,023	1,438,692
Total liabilities and stockholders' equity	\$ 3,307,283	\$ 2,395,134

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

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

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
Statements of Operations				
Revenues:				
Net product revenues	\$ 99,206	\$ 46,066	\$ 248,677	\$ 110,588
Net revenues from collaborations	26,647	23,995	80,614	37,481
Total revenues	125,853	70,061	329,291	148,069
Operating costs and expenses:				
Cost of goods sold	21,797	5,213	55,028	12,886
Research and development	161,783	160,796	486,350	453,813
Selling, general and administrative	167,472	120,351	422,129	322,728
Total operating costs and expenses	351,052	286,360	963,507	789,427
Loss from operations	(225,199)	(216,299)	(634,216)	(641,358)
Other (expense) income:				
Interest expense	(28,731)	—	(55,979)	—
Interest income	2,072	9,889	10,717	26,195
Other (expense) income	(594)	(2,519)	67,477	(2,929)
Change in fair value of liability obligation	—	—	—	9,422
Total other (expense) income	(27,253)	7,370	22,215	32,688
Loss before income taxes	(252,452)	(208,929)	(612,001)	(608,670)
(Provision) benefit for income taxes	(839)	394	(2,740)	(1,261)
Net loss	\$ (253,291)	\$ (208,535)	\$ (614,741)	\$ (609,931)
Net loss per common share - basic and diluted	\$ (2.18)	\$ (1.92)	\$ (5.37)	\$ (5.63)
Weighted-average common shares used to compute basic and diluted net loss per common share	115,986	108,701	114,554	108,427
Statements of Comprehensive Loss				
Net loss	\$ (253,291)	\$ (208,535)	\$ (614,741)	\$ (609,931)
Other comprehensive (loss) income:				
Unrealized (loss) gain on marketable debt securities	(1,481)	(50)	768	772
Foreign currency translation (losses) gains	(2,576)	1,439	(1,665)	2,281
Defined benefit pension plans, net of tax	76	71	222	(4,211)
Total other comprehensive (loss) income	(3,981)	1,460	(675)	(1,158)
Comprehensive loss	\$ (257,272)	\$ (207,075)	\$ (615,416)	\$ (611,089)

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

ALNYLAM PHARMACEUTICALS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(In thousands)
(Unaudited)

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount				
Balance as of December 31, 2019	112,188	\$ 1,122	\$ 5,201,176	\$ (36,518)	\$ (3,727,088)	\$ 1,438,692
Exercise of common stock options, net of tax withholdings	976	9	54,212	—	—	54,221
Issuance of common stock under equity plans	4	—	—	—	—	—
Stock-based compensation expense related to equity-classified awards	—	—	34,578	—	—	34,578
Other comprehensive income	—	—	—	4,459	—	4,459
Net loss	—	—	—	—	(182,221)	(182,221)
Balance as of March 31, 2020	113,168	1,131	5,289,966	(32,059)	(3,909,309)	1,349,729
Exercise of common stock options, net of tax withholdings	1,233	12	91,861	—	—	91,873
Issuance of common stock under equity plans	283	3	5,298	—	—	5,301
Issuance of common stock to strategic partners, net of closing costs	963	10	99,488	—	—	99,498
Stock-based compensation expense related to equity-classified awards	—	—	33,707	—	—	33,707
Other comprehensive loss	—	—	—	(1,153)	—	(1,153)
Net loss	—	—	—	—	(179,229)	(179,229)
Balance as of June 30, 2020	115,647	1,156	5,520,320	(33,212)	(4,088,538)	1,399,726
Exercise of common stock options, net of tax withholdings	494	5	32,207	—	—	32,212
Issuance of common stock under equity plans	2	—	129	—	—	129
Stock-based compensation expense related to equity-classified awards	—	—	40,228	—	—	40,228
Other comprehensive loss	—	—	—	(3,981)	—	(3,981)
Net loss	—	—	—	—	(253,291)	(253,291)
Balance as of September 30, 2020	116,143	\$ 1,161	\$ 5,592,884	\$ (37,193)	\$ (4,341,829)	\$ 1,215,023

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

ALNYLAM PHARMACEUTICALS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(In thousands)
(Unaudited)

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount				
Balance as of December 31, 2018	101,177	\$ 1,011	\$ 4,175,139	\$ (33,213)	\$ (2,840,972)	\$ 1,301,965
Exercise of common stock options, net of tax withholdings	207	3	11,406	—	—	11,409
Issuance of common stock under equity plans	4	—	(58)	—	—	(58)
Issuance of common stock under benefit plans	12	—	784	—	—	784
Issuance of common stock, net of costs	5,000	50	381,850	—	—	381,900
Stock-based compensation expense related to equity-classified awards	—	—	32,541	—	—	32,541
Other comprehensive income, net of tax	—	—	—	360	—	360
Net loss	—	—	—	—	(181,915)	(181,915)
Balance as of March 31, 2019	106,400	1,064	4,601,662	(32,853)	(3,022,887)	1,546,986
Exercise of common stock options, net of tax withholdings	203	2	6,180	—	—	6,182
Issuance of common stock under equity plans	55	—	4,022	—	—	4,022
Issuance of common stock under benefit plans	12	—	1,089	—	—	1,089
Issuance of common stock to strategic partners, net of closing costs	4,444	44	390,533	—	—	390,577
Stock-based compensation expense related to equity-classified awards	—	—	30,798	—	—	30,798
Other comprehensive loss, net of tax	—	—	—	(2,978)	—	(2,978)
Net loss	—	—	—	—	(219,481)	(219,481)
Balance as of June 30, 2019	111,114	1,110	5,034,284	(35,831)	(3,242,368)	1,757,195
Exercise of common stock options, net of tax withholdings	191	2	9,298	—	—	9,300
Issuance of common stock under equity plans	6	—	—	—	—	—
Issuance of common stock under benefit plans	14	1	1,001	—	—	1,002
Stock-based compensation expense related to equity-classified awards	—	—	46,665	—	—	46,665
Other comprehensive income, net of tax	—	—	—	1,460	—	1,460
Net loss	—	—	—	—	(208,535)	(208,535)
Balance as of September 30, 2019	111,325	\$ 1,113	\$ 5,091,248	\$ (34,371)	\$ (3,450,903)	\$ 1,607,087

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)

	Nine Months Ended September 30,	
	2020	2019
Cash flows from operating activities:		
Net loss	\$ (614,741)	\$ (609,931)
Non-cash adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	24,386	11,733
Amortization and interest accretion related to operating leases	29,169	27,873
Non-cash interest expense on liability related to the sale of future royalties	55,979	—
Stock-based compensation	105,597	108,644
Realized and unrealized gain on marketable equity securities	(66,626)	—
Change in fair value of liability obligation	—	(9,422)
Other	1,628	(2,061)
Changes in operating assets and liabilities:		
Accounts receivable, net	(35,070)	(29,717)
Proceeds from landlord lease incentive for tenant improvements	2,690	29,064
Inventory	(26,962)	(28,095)
Prepaid expenses and other assets	3,765	(12,748)
Accounts payable, accrued expenses and other liabilities	75,564	57,368
Deferred revenue	(15,924)	399,584
Operating lease liability	(31,272)	(24,739)
Net cash used in operating activities	(491,817)	(82,447)
Cash flows from investing activities:		
Purchases of property, plant and equipment	(48,693)	(101,351)
Purchases of marketable debt securities	(1,469,451)	(1,445,632)
Purchases of restricted investments	(9,900)	—
Proceeds from maturity of restricted investments	—	30,000
Sales and maturities of marketable securities	1,190,714	1,320,156
Other investing activities	(300)	—
Net cash used in investing activities	(337,630)	(196,827)
Cash flows from financing activities:		
Proceeds from exercise of stock options and other types of equity, net	181,459	30,942
Proceeds from the sale of future royalties	500,000	—
Proceeds from development derivative	4,200	—
Repayment of term loan	—	(30,000)
Proceeds from issuance of common stock to strategic partners, net of closing costs	99,498	400,000
Proceeds from public offering, net of costs	—	381,900
Payment of transaction costs related to sale of future royalties and term loan facility	(8,128)	—
Net cash provided by financing activities	777,029	782,842
Effect of exchange rate changes on cash, cash equivalents and restricted cash	1,946	(449)
Net (decrease) increase in cash, cash equivalents and restricted cash	(50,472)	503,119
Cash, cash equivalents and restricted cash, beginning of period	549,628	422,631
Cash, cash equivalents and restricted cash, end of period	\$ 499,156	\$ 925,750
Supplemental disclosure of noncash investing and financing activities:		
Capital expenditures included in accounts payable and accrued expenses	\$ 7,048	\$ 18,923
Lease liabilities arising from obtaining right-of-use assets	\$ 34,363	\$ 2,546
Receivable and liability related to the sale of future royalties	\$ 500,000	\$ —

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

ALNYLAM PHARMACEUTICALS, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

1. NATURE OF BUSINESS

Alnylam Pharmaceuticals, Inc. (also referred to as Alnylam, we, our or us) commenced operations on June 14, 2002 as a biopharmaceutical company seeking to develop and commercialize novel therapeutics based on RNA interference, or RNAi. We are committed to the advancement of our company strategy of building a multi-product, global, commercial biopharmaceutical company with a deep and sustainable clinical pipeline of RNAi therapeutics for future growth and a robust, organic research engine for sustainable innovation and great potential for patient impact. Since inception, we have focused on discovering, developing and commercializing RNAi therapeutics by establishing and maintaining a strong intellectual property position in the RNAi field, establishing strategic alliances with leading pharmaceutical and life sciences companies, generating revenues through licensing agreements, and ultimately developing and commercializing RNAi therapeutics globally, either independently or with our strategic partners. We have devoted substantially all of our efforts to business planning, research, development, manufacturing and early commercial efforts, acquiring, filing and expanding intellectual property rights, recruiting management and technical staff, and raising capital.

In August 2018, we received approval for ONPATTRO from the United States Food and Drug Administration, or FDA, and began commercializing and generating product revenues in the U.S., and also received marketing authorization for ONPATTRO from the European Commission, or EC. As of September 30, 2020, we have launched ONPATTRO in the U.S., Europe, Japan and in several additional countries. In November 2019, we received approval for GIVLAARI from the FDA and began commercializing and generating product revenues in the U.S. in December 2019. In March 2020, we received marketing authorization for GIVLAARI from the EC, and as of September 30, 2020, we have launched GIVLAARI in several countries in Europe. Regulatory filings in additional markets are pending or planned for the remainder of 2020 and beyond for both products.

In 2020, we entered into a broad strategic financing collaboration with The Blackstone Group Inc. and certain of its affiliates which includes a purchase and sale agreement, a credit agreement, a stock purchase agreement, and a funding agreement for the clinical development of vutrisiran and ALN-AGT, under which The Blackstone Group Inc. and certain of its affiliates will provide up to \$2.00 billion to support our advancement of innovative RNAi therapeutics. Each executed agreement is a separate unit of account and was recorded at fair value. Please read Note 5, Note 9, Note 10 and Note 11, respectively, for additional information regarding each executed agreement set forth above.

2. BASIS OF PRESENTATION AND PRINCIPLES OF CONSOLIDATION

The accompanying condensed consolidated financial statements of Alnylam 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 state 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, 2019, which were included in our Annual Report on Form 10-K that was filed with the Securities and Exchange Commission on February 13, 2020. 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.

Our significant accounting policies are described in Note 2 of the Notes to Consolidated Financial Statements included in our Annual Report on Form 10-K for the year ended December 31, 2019. Updates to our significant accounting policies, including the liability related to the sale of future royalties accounting policy and development derivative liability, resulting from the execution of a purchase and sale agreement and a funding agreement, respectively, with certain affiliates of The Blackstone Group Inc., are discussed below.

Reclassification

Certain prior period amounts in the condensed consolidated financial statements have been reclassified to conform to the current period presentation.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America, or 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. The full extent to which the COVID-19

ALNYLAM PHARMACEUTICALS, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

pandemic will directly or indirectly impact our business, results of operations and financial condition, including sales, expenses, reserves and allowances, the supply of our products and product candidates, clinical trials and research and development costs, will depend on future developments that are highly uncertain, including as a result of new information that may emerge concerning COVID-19 and the actions taken to contain or treat it, as well as the economic impact on local, regional, national and international customers and markets. We have made estimates of the impact of COVID-19 within our financial statements and there may be changes to those estimates in future periods. Actual results may differ from these estimates.

Liquidity

Based on our current operating plan, we believe that our cash, cash equivalents and marketable securities as of September 30, 2020, together with the cash we expect to generate from product sales and under our alliances and strategic financing collaboration, will be sufficient to enable us to advance our long-term strategic goals for multiple years from the filing of this Quarterly Report on Form 10-Q.

Liability Related to the Sale of Future Royalties

We account for the liability related to the sale of future royalties as a debt financing, as we have significant continuing involvement in the generation of the cash flows. Interest on the liability related to the sale of future royalties will be recognized using the effective interest rate method over the life of the related royalty stream.

The liability related to the sale of future royalties and the related interest expense are based on our current estimates of future royalties and commercial milestones expected to be paid over the life of the arrangement. We will periodically assess the expected payments and to the extent the amount or timing of our future estimated payments is materially different than our previous estimates, we will account for any such change by adjusting the liability related to the sale of future royalties and prospectively recognizing the related non-cash interest expense.

Development Derivative Liability

The development derivative liability is recorded at fair value based on the probability weighted present value of the estimated cash flows pursuant to contractual terms of the funding agreement with certain affiliates of The Blackstone Group Inc. The liability is remeasured quarterly with any change in fair value recorded in other income (expense) on the condensed consolidated statements of operations and comprehensive loss.

Recently Adopted Accounting Pronouncements

In June 2016, the Financial Accounting Standards Board, or FASB, issued new accounting guidance which requires entities to record expected credit losses for certain financial instruments, including trade receivables, as an allowance that reflects the entity's current estimate of credit losses expected to be incurred. For available-for-sale debt securities in unrealized loss positions, the new standard requires allowances to be recorded instead of reducing the amortized cost of the investment. The new standard became effective for us on January 1, 2020 and did not have a significant impact on our condensed consolidated financial statements and related disclosures.

In August 2018, the FASB issued amendments to accounting guidance that eliminate, add and modify certain disclosure requirements on fair value measurements. The new standard became effective for us on January 1, 2020 and did not have a significant impact on our condensed consolidated financial statements and related disclosures.

In August 2018, the FASB issued new accounting guidance to clarify the accounting for implementation costs in cloud computing arrangements (hosting arrangements). The new standard requires a customer in a cloud computing arrangement to determine which implementation costs to capitalize as assets or expense as incurred. Capitalized implementation costs related to a hosting arrangement that is a service contract will be amortized over the term of the hosting arrangement, beginning when the module or component of the hosting arrangement is ready for its intended use. The new standard became effective for us on January 1, 2020 and did not have a significant impact on our condensed consolidated financial statements and related disclosures.

In November 2018, the FASB issued new accounting guidance to clarify the interaction between the accounting guidance for collaborative arrangements and revenue from contracts with customers. The new standard became effective for us on January 1, 2020 using a retrospective transition method. This standard did not have a significant impact on our condensed consolidated financial statements and related disclosures.

In December 2019, the FASB issued amendments to accounting guidance that simplify the accounting for income taxes, as part of its initiative to reduce complexity in the accounting standards. The amendments eliminate certain exceptions related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period and the recognition of deferred tax liabilities for outside basis differences. The amendments also clarify and simplify other aspects of the accounting for income taxes. We early adopted the amendments as of January 1, 2020, on a prospective basis. The amendments did not have a significant impact on our condensed consolidated financial statements and related disclosures.

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3. NET PRODUCT REVENUES

Net product revenues consist of the following:

(In thousands)	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
ONPATTRO				
United States	\$ 39,027	\$ 33,591	\$ 108,491	\$ 80,543
Europe	30,478	10,857	74,664	28,311
Rest of World (primarily Japan)	13,011	1,618	32,560	1,734
Total	\$ 82,516	\$ 46,066	\$ 215,715	\$ 110,588
GIVLAARI				
United States	\$ 12,108	\$ —	\$ 26,043	\$ —
Europe	4,582	—	6,919	—
Total	\$ 16,690	\$ —	\$ 32,962	\$ —
Total net product revenues	\$ 99,206	\$ 46,066	\$ 248,677	\$ 110,588

The following table presents the balance of our receivables related to our net product revenues:

(In thousands)	As of September 30, 2020	As of December 31, 2019
Receivables included in “Accounts receivable, net”	\$ 60,787	\$ 28,082

4. NET REVENUES FROM COLLABORATIONS

Net revenues from collaborations consist of the following:

(In thousands)	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
Regeneron Pharmaceuticals (Regeneron)	\$ 14,874	\$ 15,261	\$ 49,790	\$ 15,961
Vir Biotechnology (Vir)	8,512	5,869	21,476	7,888
The Medicines Company (MDCO)	1,091	528	6,029	2,273
Sanofi Genzyme (Sanofi)	420	1,882	793	10,382
Other	1,750	455	2,526	977
Total	\$ 26,647	\$ 23,995	\$ 80,614	\$ 37,481

The following table presents the balance of our receivables and contract liabilities related to our collaboration agreements:

(In thousands)	As of September 30, 2020	As of December 31, 2019
Receivables included in “Accounts receivable, net”	\$ 18,331	\$ 14,929
Contract liabilities included in “Deferred revenue”	\$ 145,692	\$ 153,117

The following table presents revenue recognized as a result of changes in contract liability related to our collaboration agreements:

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(In thousands)	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
Amounts included in contract liability at the beginning of the period	\$ 19,212	\$ 12,333	\$ 50,716	\$ 3,954

In order to determine revenue recognized in the period from contract liabilities, we first allocate revenue to the individual contract liability balance outstanding at the beginning of the period until the revenue exceeds that balance. If additional consideration is received on those contracts in subsequent periods, we assume all revenue recognized in the reporting period first applies to the beginning contract liability as opposed to a portion applying to the new consideration for the period.

The following table provides research and development expenses incurred by type, for which we recognize net revenue, that are directly attributable to our collaboration agreements, by collaboration partner:

(In thousands)	Three Months Ended September 30,					
	2020			2019		
	Clinical Trial and Manufacturing	External Services	Other	Clinical Trial and Manufacturing	External Services	Other
Regeneron	\$ 3,355	\$ 43	\$ 9,167	\$ 637	\$ 959	\$ 9,518
Vir	1,379	277	3,247	4,843	20	2,393
MDCO	—	—	67	347	5,992	398
Sanofi	513	17	479	3,262	110	1,588
Total	\$ 5,247	\$ 337	\$ 12,960	\$ 9,089	\$ 7,081	\$ 13,897

(In thousands)	Nine Months Ended September 30,					
	2020			2019		
	Clinical Trial and Manufacturing	External Services	Other	Clinical Trial and Manufacturing	External Services	Other
Regeneron	\$ 10,751	\$ 67	\$ 33,290	\$ 1,152	\$ 1,010	\$ 9,943
Vir	2,757	486	8,539	5,385	268	2,733
MDCO	998	—	611	2,024	6,002	458
Sanofi	712	46	875	11,033	326	1,681
Total	\$ 15,218	\$ 599	\$ 43,315	\$ 19,594	\$ 7,606	\$ 14,815

The research and development expenses incurred for each agreement listed in the table above consist of costs incurred for (i) clinical and manufacturing expenses, (ii) external services including consulting services and lab supplies and services, and (iii) other expenses, including professional services, facilities and overhead allocations, and a reasonable estimate of compensation and related costs as billed to our counterparties, for which we recognize net revenue from collaborations. For the three and nine months ended September 30, 2020 and 2019, we did not incur material selling, general and administrative expenses related to our collaboration agreements.

Product Alliances

Vir Biotechnology, Inc.

In October 2017, we and Vir Biotechnology, Inc., or Vir, entered into a collaboration and license agreement, or the Vir Agreement, for the development and commercialization of RNAi therapeutics for infectious diseases, including chronic hepatitis B virus, or HBV, infection.

Pursuant to the Vir Agreement, we granted to Vir an exclusive license to develop, manufacture and commercialize ALN-HBV02 (VIR-2218), for all uses and purposes other than certain excluded fields, as set forth in the Vir Agreement. In addition, we granted Vir an exclusive option for up to four additional RNAi therapeutic programs for the treatment of infectious diseases. Under the terms of the Vir Agreement, for each product arising from the HBV program, including ALN-HBV02, we retain the right to opt into a profit-sharing arrangement prior to the start of a Phase 3 clinical trial. In addition, we have the right on a product-by-product basis with respect to each additional infectious disease program that Vir elects to pursue, to opt into a

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profit-sharing arrangement for each such product at any time during a specified period prior to the achievement of clinical proof of concept for each such product.

Pursuant to the Vir Agreement, Vir paid us an upfront fee of \$10.0 million and issued to us 1,111,111 shares of its common stock. Under the Vir Agreement, we may also receive milestone payments upon the achievement of certain development, regulatory and commercial milestones, as well as royalties on the net sales of licensed products, if any, ranging from high-single-digit to sub-teen double-digit percentages. In March 2020, we achieved a development milestone relating to ALN-HBV02 and earned a \$15.0 million cash milestone and 1,111,111 shares of Vir's common stock, which were received in the second quarter of 2020. In June 2020, we earned and received a \$10.0 million payment from Vir related to Vir's sublicense for ALN-HBV02 in China. 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 under the Vir Agreement.

In March and April 2020, we entered into amendments to the Vir Agreement to expand our collaboration to include the development and commercialization of RNAi therapeutics targeting SARS-CoV-2, the virus that causes the disease COVID-19, along with three additional targets focused on human host factors for SARS-CoV-2, including angiotensin converting enzyme-2, or ACE2 and transmembrane protease, serine 2, or TMPRSS2, and potentially a third mutually selected host factor target. Under the Vir amendments, we and Vir will each be responsible for pre-clinical development costs incurred by each such party in performing its allocated responsibilities under an agreed-upon initial pre-clinical development plan. We and Vir will equally share certain costs incurred in connection with the manufacture of non-GMP drug product required for pre-clinical development prior to filing an IND for the first product in the coronavirus program. Vir will lead all development and commercialization of any selected development candidates. At clinical proof of concept, we will have an option to share equally in the profits and losses associated with the development and commercialization of the coronavirus program. Alternatively, we may elect to earn development and commercialization milestones and royalties on net sales of products resulting from the collaboration in amounts agreed upon for the coronavirus program.

Unless terminated earlier in accordance with the terms of the agreement, the Vir Agreement expires on a licensed product-by-product and country-by-country basis upon expiration of all royalty payment obligations under the agreement. If Vir does not exercise its option for an infectious disease program, the Vir Agreement will expire upon the expiration of the applicable option period with respect to such program. However, if we exercise our profit-sharing option for any product, the term of the agreement will continue until the expiration of the profit-sharing arrangement for such product.

Either party may terminate the agreement in the event the other party fails to cure a material breach, or upon patent-related challenges by the other party. In addition, Vir has the right to terminate the agreement on a program-by-program basis or in its entirety for any reason on 90 days' written notice.

We identified one performance obligation under the Vir Agreement, as amended, comprised of: i) the exclusive license to develop, manufacture and commercialize RNAi therapeutics (including ALN-HBV02 and other infectious diseases); ii) the obligation to deliver four additional development candidates and supply product for each of the RNAi therapeutic programs for the treatment of infectious diseases; and iii) the obligation to deliver up to four development candidates and supply product for RNAi therapeutic programs targeting SARS-CoV-2. The license is not distinct from the services, including the obligation to deliver development candidates and supply product, as Vir cannot benefit on its own from the value of the license without receipt of such services and supply.

We measure proportional performance over time using an input method based on cost incurred relative to the total estimated costs for the identified performance obligation, on a quarterly basis, by determining the proportion of effort incurred as a percentage of total effort we expect to expend. This ratio is applied to the total transaction price. Management has applied significant judgment in the process of developing our estimates. Any changes to these estimates will be recognized in the period in which they change as a cumulative catch up. We re-evaluate the transaction price as of the end of each reporting period and as of September 30, 2020, the total transaction price was determined to be \$145.2 million. As of September 30, 2020, the transaction price is comprised of the upfront payment, fair value of non-cash equity consideration at contract inception, milestones achieved and variable consideration related to development, manufacture and supply activities. The total transaction price is allocated entirely to the single performance obligation. We utilized the expected value method to determine the amount of reimbursement for these activities. We determined any variable consideration related to sales-based royalties and milestones related to the exclusive license to be constrained and therefore excluded such consideration from the transaction price.

As of September 30, 2020, the aggregate amount of the transaction price allocated to the performance obligation that was unsatisfied was \$96.8 million, which is expected to be recognized through the term of the Vir Agreement as the services are performed.

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Regeneron Pharmaceuticals, Inc.

On April 8, 2019, we entered into a global, strategic collaboration with Regeneron Pharmaceuticals, Inc., or Regeneron, to discover, develop and commercialize RNAi therapeutics for a broad range of diseases by addressing therapeutic targets expressed in the eye and central nervous system, or CNS, in addition to a select number of targets expressed in the liver, which we refer to as the Regeneron Collaboration. The Regeneron Collaboration is governed by a Master Agreement, referred to as the Regeneron Master Agreement, which became effective on May 21, 2019, or the Effective Date. In connection with the Regeneron Master Agreement, we and Regeneron entered into (i) a binding co-co collaboration term sheet covering the continued development of cemdisiran, our C5 small interfering RNA, or siRNA, currently in Phase 2 development for C5 complement-mediated diseases, as a monotherapy and (ii) a binding license term sheet to evaluate anti-C5 antibody-siRNA combinations for C5 complement-mediated diseases including evaluating the combination of Regeneron's pozelimab (REGN3918), currently in Phase 1 development, and cemdisiran. The C5 co-co collaboration and license agreements were executed in August 2019.

Under the terms of the Regeneron Collaboration, we are working exclusively with Regeneron to discover RNAi therapeutics for eye and CNS diseases for an initial five-year research period, which we refer to as the Initial Research Term. Regeneron has an option to extend the Initial Research Term (referred to as the Research Term Extension Period, and together with the Initial Research Term, the Research Term) for up to an additional two years, for a research term extension fee of up to \$400.0 million. The Regeneron Collaboration also covers a select number of RNAi therapeutic programs designed to target genes expressed in the liver, including our previously announced collaboration with Regeneron to identify RNAi therapeutics for the chronic liver disease nonalcoholic steatohepatitis. We retain broad global rights to all of our other unpartnered liver-directed clinical and pre-clinical pipeline programs. The Regeneron Collaboration is governed by a joint steering committee that is comprised of an equal number of representatives from each party.

Regeneron will lead development and commercialization for all programs targeting eye diseases (subject to limited exceptions), entitling us to certain potential milestone and royalty payments pursuant to the terms of a license agreement, the form of which has been agreed upon by the parties. We and Regeneron will alternate leadership on CNS and liver programs, with the lead party retaining global development and commercial responsibility. For CNS and liver programs, both we and Regeneron will have the option at lead candidate selection to enter into a co-co collaboration agreement, the form of which has been agreed upon by the parties, whereby both companies will share equally all costs of, and profits from, all development and commercialization activities under the program. If the non-lead party elects to not enter into a co-co collaboration agreement with respect to a given CNS or liver program, we and Regeneron will enter into a license agreement with respect to such program and the lead party will be the "Licensee" for the purposes of the license agreement. If the lead party for a CNS or liver program elects to not enter into the co-co collaboration agreement, then we and Regeneron will enter into a license agreement with respect to such program and leadership of the program will transfer to the other party and the former non-lead party will be the "Licensee" for the purposes of the license agreement.

With respect to the programs directed to C5 complement-mediated diseases, we retain control of cemdisiran monotherapy development, and Regeneron is leading combination product development. Under the C5 co-co collaboration agreement, we and Regeneron equally share costs and potential future profits on any monotherapy program. Under the C5 license agreement, for cemdisiran to be used as part of a combination product, Regeneron is solely responsible for all development and commercialization costs and we will receive low double-digit royalties and commercial milestones of up to \$325.0 million on any potential combination product sales. The C5 co-co collaboration agreement, the C5 license agreement, and the Master Agreement have been combined for accounting purposes and treated as a single agreement.

In connection with the Regeneron Master Agreement, Regeneron made an upfront payment of \$400.0 million. We are also eligible to receive up to an additional \$200.0 million in milestone payments upon achievement of certain criteria during early clinical development for eye and CNS programs. We and Regeneron plan to advance programs directed to up to 30 targets under the Regeneron Collaboration during the Initial Research Term. For each program, Regeneron will provide us with \$2.5 million in funding at program initiation and an additional \$2.5 million at lead candidate identification, with the potential for approximately \$30.0 million in annual discovery funding to us as the Regeneron Collaboration reaches steady state.

Regeneron has the right to terminate the Regeneron Master Agreement for convenience upon ninety days' notice. The termination of the Regeneron Master Agreement does not affect the term of any license agreement or co-co collaboration agreement then in effect. In addition, either party may terminate the Regeneron Master Agreement for a material breach by, or insolvency of, the other party. Unless earlier terminated pursuant to its terms, the Regeneron Master Agreement will remain in effect with respect to each program until (a) such program becomes a terminated program or (b) the parties enter into a license agreement or co-co collaboration agreement with respect to such program. The Regeneron Master Agreement includes various representations, warranties, covenants, dispute escalation and resolution mechanisms, indemnities and other provisions customary for transactions of this nature.

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For any license agreement subsequently entered into, the licensee will generally be responsible for its own costs and expenses incurred in connection with the development and commercialization of the collaboration products. The licensee will pay to the licensor certain development and/or commercialization milestone payments totaling up to \$150.0 million for each collaboration product. In addition, following the first commercial sale of the applicable collaboration product under a license agreement, the licensee is required to make certain tiered royalty payments, ranging from low double-digits up to 20%, to the licensor based on the aggregate annual net sales of the collaboration product, subject to customary reductions.

For any co-co collaboration agreement subsequently entered into, we and Regeneron will share equally all costs of, and profits from, development and commercialization activities. Reimbursement of our share of development costs will be recognized as a reduction to research and development expense in the consolidated statements of operations and comprehensive loss. In the event that a party exercises its opt-out right, the lead party will be responsible for all costs and expenses incurred in connection with the development and commercialization of the collaboration products under the applicable co-co collaboration agreement, subject to continued sharing of costs through defined points. If a party exercises its opt-out right, following the first commercial sale of the applicable collaboration product under a co-co collaboration agreement, the lead party is required to make certain tiered royalty payments, ranging from low double-digits up to 20%, to the other party based on the aggregate annual net sales of the collaboration product and the timing of the exercise of the opt-out right, subject to customary reductions and a reduction for opt-out transition costs.

Due to the uncertainty of pharmaceutical development and the high historical failure rates generally associated with drug development, we may not receive any milestone or royalty payments from Regeneron under the Regeneron Master Agreement, the C5 license agreement, or any future license agreement, or under any co-co collaboration agreement in the event we exercise our opt-out right.

Our obligations under the Regeneron Collaboration include: (i) a research license and research services, collectively referred to as the Research Services Obligation; (ii) a worldwide license to cemdisiran for combination therapies, and manufacturing and supply, and development service obligations, collectively referred to as the C5 License Obligation; and (iii) development, manufacturing and commercialization activities for cemdisiran monotherapies, referred to as the C5 Co-Co Obligation.

The research license is not distinct from the research services primarily as a result of Regeneron being unable to benefit on its own or with other resources reasonably available, as the license is providing access to specialized expertise, particularly as it relates to RNAi technology that is not available in the marketplace. Similarly, the worldwide license to cemdisiran for combination therapies is not distinct from the manufacturing and supply, and development service obligations, as Regeneron cannot benefit on its own from the value of the license without receipt of supply.

Separately, the cemdisiran monotherapy co-co collaboration agreement is under the scope of ASC 808 as we and Regeneron are both active participants in the development and manufacturing activities and are exposed to significant risks and rewards that are dependent on commercial success of the activities of the arrangement. The development and manufacturing activities are a combined unit of account under the scope of ASC 808 and are not deliverables under ASC 606.

The total transaction price is comprised of the \$400.0 million upfront payment and additional variable consideration related to research, development, manufacturing and supply activities related to the Research Services Obligation and the C5 License Obligation. We utilized the expected value method to determine the amount of reimbursement for these activities. We determined that any variable consideration related to sales-based royalties and milestones related to the worldwide license to cemdisiran for combination therapies is deemed to be constrained and therefore has been excluded from the transaction price. In addition, we are eligible to receive future milestones upon the achievement of certain criteria during early clinical development for the eye and CNS programs. We are also eligible to receive royalties on future commercial sales for certain eye, CNS or liver targets, if any; however, these amounts are excluded from variable consideration under the Regeneron Collaboration as we are only eligible to receive such amounts if, after a drug candidate is identified, the form of license agreement is subsequently executed resulting in a license that is granted to Regeneron. Any such subsequently granted license would represent a separate transaction under ASC 606.

We allocated the initial transaction price to each unit of account based on the applicable accounting guidance as follows, in thousands:

Performance Obligations	Standalone Selling Price	Transaction Price Allocated	Accounting Guidance
Research Services Obligation	\$ 130,700	\$ 183,100	ASC 606
C5 License Obligation	97,600	92,500	ASC 606
C5 Co-Co Obligation	364,600	246,000	ASC 808
		<u>\$ 521,600</u>	

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The transaction price was allocated to the obligations based on the relative estimated standalone selling prices of each obligation, over which management has applied significant judgment. We developed the estimated standalone selling price for the licenses included in the Research Services Obligation and the C5 License Obligation primarily based on the probability-weighted present value of expected future cash flows associated with each license related to each specific program. In developing such estimate, we applied judgment in the determination of the forecasted revenues, taking into consideration the applicable market conditions and relevant entity-specific factors, the expected number of targets or indications expected to be pursued under each license, the probability of success, the time needed to develop a product candidate pursuant to the associated license and the discount rate. We developed the estimated standalone selling price for the services and/or manufacturing and supply included in each of the obligations, as applicable, primarily based on the nature of the services to be performed and/or goods to be manufactured and estimates of the associated costs. The estimated standalone selling price of the C5 Co-Co Obligation was developed by estimating the present value of expected future cash flows that Regeneron is entitled to receive. In developing such estimate, we applied judgment in determining the indications that will be pursued, the forecasted revenues for such indications, the probability of success and the discount rate.

For the Research Services Obligation and the C5 License Obligation accounted for under ASC 606, we measure proportional performance over time using an input method based on cost incurred relative to the total estimated costs for each of the identified obligations, on a quarterly basis, by determining the proportion of effort incurred as a percentage of total effort we expect to expend. This ratio is applied to the transaction price allocated to each obligation. Management has applied significant judgment in the process of developing our estimates. Any changes to these estimates will be recognized in the period in which they change as a cumulative catch up. We re-evaluate the transaction price as of the end of each reporting period and during the quarter ended September 30, 2020, there was no change to the transaction price calculated at December 31, 2019. For the C5 Co-Co Obligation accounted for under ASC 808, the transaction price allocated to this obligation is recognized using a proportional performance method. Revenue recognized under this agreement, inclusive of the amount allocated to the C5 Co-Co Obligation and future cost reimbursements, is accounted for as collaboration revenue.

The following table provides a summary of the transaction price allocated to each unit of account based on the applicable accounting guidance, in addition to revenue activity during the period, in thousands:

Performance Obligations	Transaction Price Allocated		Deferred Revenue		Accounting Guidance
	As of September 30, 2020	As of September 30, 2020	As of September 30, 2020	As of December 31, 2019	
Research Services Obligation	\$ 200,600	\$ 64,000	\$ 84,800		ASC 606
C5 License Obligation	108,500	65,800	65,800		ASC 606
C5 Co-Co Obligation	246,000	233,500	243,000		ASC 808
	<u>\$ 555,100</u>	<u>\$ 363,300</u>	<u>\$ 393,600</u>		

Performance Obligations	Revenue Recognized During				Accounting Guidance
	Three Months Ended September 30,		Nine Months Ended September 30,		
	2020	2019	2020	2019	
Research Services Obligation	\$ 10,700	\$ 11,100	\$ 33,300	\$ 11,800	ASC 606
C5 License Obligation	—	—	—	—	ASC 606
C5 Co-Co Obligation	2,400	3,600	9,500	3,600	ASC 808
	<u>\$ 13,100</u>	<u>\$ 14,700</u>	<u>\$ 42,800</u>	<u>\$ 15,400</u>	

As of September 30, 2020, the aggregate amount of the transaction price allocated to the remaining Research Services Obligation and C5 License Obligation that was unsatisfied is \$254.8 million, which is expected to be recognized through the term of the Regeneron Collaboration as the services are performed. This amount excludes the transaction price allocated to the C5 Co-Co Obligation accounted for under ASC 808. Deferred revenue related to the Regeneron Collaboration is classified as either current or non-current in the condensed consolidated balance sheets based on the period the revenue is expected to be recognized.

The Medicines Company

In February 2013, we and The Medicines Company, or MDCO, entered into a license and collaboration agreement pursuant to which we granted to MDCO an exclusive, worldwide license to develop, manufacture and commercialize RNAi therapeutics targeting proprotein convertase subtilisin/kexin type 9, or PCSK9, for the treatment of hypercholesterolemia and other human diseases, including inclisiran. We refer to this agreement, as amended through the date hereof, as the MDCO

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License Agreement. Under the MDCO License Agreement, MDCO paid us an upfront cash payment of \$25.0 million. As of September 30, 2020, we have earned \$30.0 million of development milestones and upon achievement of certain events, we will be entitled to receive additional milestone payments, up to an aggregate of \$150.0 million, \$50.0 million in specified regulatory milestones and \$100.0 million in specified commercialization milestones. In addition, we will be entitled to royalties ranging from 10% up to 20% based on annual worldwide net sales, if any, of licensed products by MDCO, its affiliates and sublicensees, subject to reduction under specified circumstances. 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 under the MDCO License Agreement.

The collaboration between us and MDCO is governed by a joint steering committee comprised of an equal number of representatives from each party.

In April 2016, we and MDCO entered into a supply and technical transfer agreement to provide for our supply of inclisiran to MDCO, in accordance with the terms of the MDCO agreement. MDCO now has the sole right and responsibility to manufacture and supply inclisiran for development and commercialization under the MDCO development plan, subject to the terms of the MDCO agreement and the supply and technical transfer agreement.

Unless terminated earlier in accordance with the terms of the agreement, the MDCO License Agreement expires on a licensed product-by-licensed product and country-by-country basis upon expiration of the last royalty term for any licensed product in any country, where a royalty term is defined as the latest to occur of (1) the expiration of the last valid claim of patent rights covering a licensed product, (2) the expiration of the Regulatory Exclusivity, as defined in the MDCO License Agreement, and (3) the twelfth anniversary of the first commercial sale of the licensed product in such country. We estimate that our fundamental RNAi patents covering licensed products under the MDCO License Agreement will expire both in and outside of the U.S. generally between 2016 and 2028. We also estimate that our inclisiran product-specific patents covering licensed products under the MDCO License Agreement will expire in the U.S., Europe, China and Japan in 2036 and elsewhere at the end of 2033. These patent rights are subject to potential patent term extensions and/or supplemental protection certificates extending such terms in countries where such extensions may become available due to regulatory delay. In addition, more patent filings relating to the collaboration may be made in the future.

We evaluated the MDCO License Agreement and concluded that MDCO meets the definition of a customer and that the MDCO License Agreement is a contract. We determined the transaction price, identified the performance obligations and allocated the transaction price to each performance obligation. We also determined that substantially all of our performance obligations are within the scope of the revenue standard as they relate to the delivery of goods and services to a customer for that customer's use in monetizing an asset. Specifically, we concluded that MDCO meets the definition of a customer as we are delivering intellectual property and know-how rights as well as research and development activities. In addition, we determined that the MDCO License Agreement met the requirements to be accounted for as a contract, including that it is probable that we will collect the consideration to which we are entitled in exchange for the goods or services that will be delivered to MDCO. We determined that, pursuant to the revenue standard, the performance obligations were not separately identifiable and were not distinct (and did not have standalone value) due to the specialized nature of the services to be provided by us and the dependent relationship between the performance obligations. Given this fact pattern, we have concluded the MDCO License Agreement has a single identified or combined performance obligation.

None of the unearned milestones are included in the transaction price, as all unearned milestone amounts are not considered likely of achievement and therefore constrained. We considered several factors, including that achievement of the milestones is outside our control and contingent upon success in clinical trials and regulatory decisions and the licensee's efforts. Any consideration related to sales-based royalties (including milestones) will be recognized when the related sales occur as they were determined to relate predominantly to the license granted to MDCO and as a result have also been excluded from the transaction price. During 2018, we completed the performance obligations identified in the MDCO License Agreement, including the supply and technical transfer agreement, however, we continue to receive additional orders for supply. We consider such orders as promised goods to be distinct from the other performance obligations since MDCO now has the ability to begin manufacturing on its own through its own vendors. Such option orders will be treated as separate agreements and any associated revenue will be recognized upon transfer of control.

On January 6, 2020, Novartis AG completed its acquisition of MDCO and all rights and obligations under the MDCO License Agreement.

Sanofi Genzyme

On April 8, 2019, we and Sanofi Genzyme entered into an amendment to our 2014 Sanofi Genzyme collaboration, which we refer to as the Collaboration Amendment. Under the Collaboration Amendment, we and Sanofi Genzyme agreed to conclude the research and option phase under our collaboration agreement. In connection and simultaneously with entering into the Collaboration Amendment, we and Sanofi Genzyme also entered into the Amended and Restated ALN-AT3 Global License

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Terms with respect to ALN-AT3 (fitusiran) and certain back-up products, which we refer to as the A&R AT3 License Terms. The A&R AT3 License Terms amend and restate the ALN-AT3 Global License Terms entered into by us and Sanofi Genzyme in January 2018 to modify certain of the business terms. The material collaboration terms for fitusiran, as previously announced, will continue unchanged.

In connection with entering into the Collaboration Amendment and the A&R AT3 License Terms, we agreed to advance, at our cost, a selected investigational asset in an undisclosed rare genetic disease through the end of IND-enabling studies. Following completion of such studies, we will transition, at our cost, such asset to Sanofi Genzyme. Thereafter, Sanofi Genzyme will fund all potential future development and commercialization costs for such asset. If this asset is developed and approved, we will be eligible to receive tiered double-digit royalties on global net sales.

No changes were made to our Exclusive License Agreement with Sanofi Genzyme, referred to as the Exclusive TTR License, pursuant to which we have global rights for the development and commercialization of ONPATTRO, together with vutrisiran and all back-up products, which remains in full force and effect.

5. LIABILITY RELATED TO THE SALE OF FUTURE ROYALTIES

On April 10, 2020, we entered into a purchase and sale agreement, or Purchase Agreement, with BX Bodyguard Royalties L.P. (an affiliate of The Blackstone Group Inc.), or Blackstone Royalties, under which Blackstone Royalties acquired 50% of royalties payable, or Royalty Interest, with respect to net sales by MDCO, its affiliates or sublicensees of inclisiran and any other licensed products under the MDCO License Agreement, and 75% of the commercial milestone payments payable under the MDCO License Agreement, together with the Royalty Interest, the Purchased Interest. If Blackstone Royalties does not receive payments in respect of the Royalty Interest by December 31, 2029, equaling at least \$1.00 billion, Blackstone Royalties will receive 55% of the Royalty Interest beginning on January 1, 2030. In consideration for the sale of the Purchased Interest, Blackstone Royalties paid us \$500.0 million in April 2020 and has an unconditional obligation to pay us an additional \$500.0 million on September 30, 2021, which was recorded as a receivable upon execution of the Purchase Agreement.

We continue to own or control all inclisiran intellectual property rights and are responsible for certain ongoing manufacturing and supply obligations related to the generation of the Purchased Interest. Due to our continuing involvement, we will continue to account for any royalties and commercial milestones due to us under the MDCO License Agreement as revenue on our condensed consolidated statement of operations and comprehensive loss and record the proceeds from this transaction as a liability, net of closing costs, on our condensed consolidated balance sheet.

In order to determine the amortization of the liability related to the sale of future royalties, we are required to estimate the total amount of future payments to Blackstone Royalties over the life of the Purchase Agreement. The \$1.00 billion liability, recorded at execution of the agreement, will be accreted to the total of these royalty and commercial milestone payments as interest expense over the life of the Purchase Agreement. At execution, our estimate of this total interest expense resulted in an effective annual interest rate of 11%. This estimate contains assumptions that impact both the amount recorded at execution and the interest expense that will be recognized in future periods.

As payments are made to Blackstone Royalties, the balance of the liability will be effectively repaid over the life of the Purchase Agreement. As inclisiran is not yet approved for sale, the exact timing and amount of repayment is likely to change each reporting period. A significant increase or decrease in net sales of inclisiran will materially impact the liability related to the sale of future royalties, interest expense and the time period for repayment. We will periodically assess the expected payments to Blackstone Royalties and to the extent the amount or timing of such payments is materially different than our initial estimates, we will prospectively adjust the amortization of the liability related to the sale of future royalties and the related interest expense.

As of September 30, 2020, the carrying value of the liability related to the sale of future royalties was \$1.04 billion, net of closing costs of \$13.0 million. The carrying value of the liability related to the sale of future royalties approximates fair value as of September 30, 2020 and is based on our current estimates of future royalties and commercial milestones expected to be paid to Blackstone Royalties over the life of the arrangement, which are considered Level 3 inputs. For the three and nine months ended September 30, 2020, we recognized interest expense of \$28.7 million and \$56.0 million, respectively.

The following table shows the activity with respect to the liability related to the sale of future royalties, in thousands:

Liability related to the sale of future royalties as of April 10, 2020	\$ 1,000,000
Capitalized closing costs	(12,955)
Interest expense recognized	55,979
Carrying value of liability related to sale of future royalties as of September 30, 2020	<u>\$ 1,043,024</u>

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6. FAIR VALUE MEASUREMENTS

The following tables present information about our financial assets and liabilities that are measured at fair value on a recurring basis and indicate the fair value hierarchy of the valuation techniques we utilized to determine such fair value:

(In thousands)	As of September 30, 2020	Quoted Prices in Active Markets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Financial assets				
Cash equivalents:				
U.S. treasury securities	\$ 15,000	\$ —	\$ 15,000	\$ —
Money market funds	294,770	294,770	—	—
Marketable debt securities:				
Corporate notes	32,087	—	32,087	—
U.S. government-sponsored enterprise securities	252,944	—	252,944	—
U.S. treasury securities	994,924	—	994,924	—
Marketable equity securities	57,217	57,217	—	—
Restricted cash (money market funds)	1,483	1,483	—	—
Total financial assets	<u>\$ 1,648,425</u>	<u>\$ 353,470</u>	<u>\$ 1,294,955</u>	<u>\$ —</u>
Financial liabilities				
Development derivative liability	<u>\$ 5,430</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$ 5,430</u>

(In thousands)	As of December 31, 2019	Quoted Prices in Active Markets (Level 1)	Significant Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Financial assets				
Cash equivalents:				
Commercial paper	\$ 3,439	\$ —	\$ 3,439	\$ —
U.S. treasury securities	336,693	—	336,693	—
Money market funds	119,882	119,882	—	—
Marketable debt securities:				
Certificates of deposit	4,301	—	4,301	—
Commercial paper	36,474	—	36,474	—
Corporate notes	146,040	—	146,040	—
U.S. government-sponsored enterprise securities	32,488	—	32,488	—
U.S. treasury securities	755,714	—	755,714	—
Marketable equity securities	13,967	13,967	—	—
Restricted cash (money market funds)	1,482	1,482	—	—
Total financial assets	<u>\$ 1,450,480</u>	<u>\$ 135,331</u>	<u>\$ 1,315,149</u>	<u>\$ —</u>

During the nine months ended September 30, 2019 there were no transfers between Level 1 and Level 2 financial assets or liabilities. During the nine months ended September 30, 2020, we transferred one financial asset from Level 2 to Level 1 as a result of the expiration on the securities holding period restriction. There were no other transfers between Level 1 and Level 2 financial assets or liabilities during the nine months ended September 30, 2020. The carrying amounts reflected on our condensed consolidated balance sheets for cash, accounts receivable, net, other current assets, accounts payable and accrued expenses approximate fair value due to their short-term maturities.

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In March 2020, pursuant to the Vir Agreement, we achieved a development milestone relating to ALN-HBV02 and earned a \$15.0 million cash milestone and 1,111,111 shares of Vir's common stock, which were received in the second quarter of 2020. As a result of certain securities law restrictions, our Vir common stock was subject to a 180-day holding period, which expired in September 2020. As of June 30, 2020, we recorded the investment at fair value, with the effect of the holding period restriction estimated using an option pricing valuation model, which was considered a Level 2 input. As a result of the expiration of holding period restriction as of September 30, 2020, the securities investment was transferred from a Level 2 to a Level 1 financial asset.

7. MARKETABLE DEBT SECURITIES

We invest our excess cash balances in marketable debt securities and at each balance sheet date presented, we classify all of our investments in debt securities as available-for-sale and as current assets as they represent the investment of funds available for current operations. We did not record any impairment charges related to our marketable debt securities during the three and nine months ended September 30, 2020 or 2019.

The following tables summarize our marketable debt securities:

(In thousands)	As of September 30, 2020			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Corporate notes	\$ 32,064	\$ 23	\$ —	\$ 32,087
U.S. government-sponsored enterprise securities	253,014	171	(241)	252,944
U.S. treasury securities	1,008,972	1,011	(59)	1,009,924
Total	<u>\$ 1,294,050</u>	<u>\$ 1,205</u>	<u>\$ (300)</u>	<u>\$ 1,294,955</u>

(In thousands)	As of December 31, 2019			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Certificates of deposit	\$ 4,303	\$ —	\$ (2)	\$ 4,301
Commercial paper	39,913	—	—	39,913
Corporate notes	146,016	58	(34)	146,040
U.S. government-sponsored enterprise securities	32,487	3	(2)	32,488
U.S. treasury securities	1,092,293	185	(71)	1,092,407
Total	<u>\$ 1,315,012</u>	<u>\$ 246</u>	<u>\$ (109)</u>	<u>\$ 1,315,149</u>

The fair values of our marketable debt securities by classification in the condensed consolidated balance sheets were as follows:

(In thousands)	As of September 30, 2020		As of December 31, 2019	
Cash and cash equivalents	\$	15,000	\$	340,132
Marketable debt securities		1,279,955		975,017
Total	<u>\$</u>	<u>1,294,955</u>	<u>\$</u>	<u>1,315,149</u>

8. OTHER BALANCE SHEET DETAILS

The components of inventory are summarized as follows:

(In thousands)	As of September 30, 2020		As of December 31, 2019	
Raw materials	\$	54,354	\$	15,418
Work in progress		22,425		38,275
Finished goods		7,261		2,655
Total	<u>\$</u>	<u>84,040</u>	<u>\$</u>	<u>56,348</u>

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As of September 30, 2020, we capitalized \$19.2 million of inventory produced for commercial sale for products awaiting regulatory approval and had long-term inventory of \$17.1 million in other assets in our condensed consolidated balance sheet as we anticipate it being consumed beyond our normal operating cycle. As of December 31, 2019, there was no capitalized inventory for products awaiting regulatory approval or long-term inventory.

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within our condensed consolidated balance sheets that sum to the total of these amounts shown in the condensed consolidated statements of cash flows:

(In thousands)	As of September 30,	
	2020	2019
Cash and cash equivalents	\$ 496,704	\$ 923,304
Restricted cash included in prepaid expenses and other current assets	5	4
Restricted cash included in long-term other assets	2,447	2,442
Total cash, cash equivalents, and restricted cash shown in the condensed consolidated statements of cash flows	\$ 499,156	\$ 925,750

The following tables summarize the changes in accumulated other comprehensive loss, by component:

(In thousands)	Loss on Investment in Joint Venture	Defined Benefit Pension Plans	Unrealized Gains from Debt Securities	Foreign Currency Translation Adjustment	Total Accumulated Other Comprehensive Loss
Balance as of December 31, 2019	\$ (32,792)	\$ (3,520)	\$ 137	\$ (343)	\$ (36,518)
Other comprehensive income (loss) before reclassifications	—	—	7	(1,665)	(1,658)
Amounts reclassified from other comprehensive income	—	222	761	—	983
Net other comprehensive income (loss)	—	222	768	(1,665)	(675)
Balance as of September 30, 2020	\$ (32,792)	\$ (3,298)	\$ 905	\$ (2,008)	\$ (37,193)

(In thousands)	Loss on Investment in Joint Venture	Defined Benefit Pension Plans	Unrealized (Losses) Gains from Debt Securities	Foreign Currency Translation Adjustment	Total Accumulated Other Comprehensive Loss
Balance as of December 31, 2018	\$ (32,792)	\$ —	\$ (421)	\$ —	\$ (33,213)
Other comprehensive (loss) income before reclassifications	—	(4,282)	359	2,281	(1,642)
Amounts reclassified from other comprehensive income	—	71	413	—	484
Net other comprehensive (loss) income	—	(4,211)	772	2,281	(1,158)
Balance as of September 30, 2019	\$ (32,792)	\$ (4,211)	\$ 351	\$ 2,281	\$ (34,371)

Amounts reclassified out of accumulated other comprehensive loss relate to settlements of marketable debt securities and amortization of our pension obligation which are recorded as interest income and other income, respectively, in the condensed consolidated statements of operations and comprehensive loss.

9. CREDIT AGREEMENT

On April 10, 2020, we entered into a credit agreement, or Credit Agreement, among us, certain of our subsidiaries (such subsidiaries, together with us, the Loan Parties), funds or accounts managed or advised by GSO Capital Partners LP and certain other affiliates of The Blackstone Group Inc., and the other lenders from time to time parties thereto, collectively, the Lenders, and Wilmington Trust, National Association, as the administrative agent for the Lenders. The Credit Agreement provides for a

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senior secured delayed draw term loan facility of up to \$700.0 million to be funded in three tranches, collectively referred to as the Term Loans, as follows:

Tranche	Requested No Later Than	Aggregate Principal Amount, up to (in thousands)
Tranche 1 Loan	December 31, 2020	\$ 200,000
Tranche 2 Loan	June 30, 2021	250,000
Tranche 3 Loan	December 31, 2021	250,000
Total		<u>\$ 700,000</u>

In addition, we may (a) at any time following April 10, 2021, request an increase in respect of the unfunded commitments in an amount not to exceed \$50.0 million on terms to be agreed and subject to the consent of the Lenders providing such increase and/or (b) at any time prior to April 10, 2021, cancel the unfunded commitments or reallocate the unfunded commitments in respect of the Tranche 2 Loan or Tranche 3 Loan to the Tranche 1 Loan and/or the Tranche 2 Loan in an amount not to exceed \$100.0 million in the aggregate for all such cancellations or reallocations.

The Tranche 1 Loan will be requested no later than December 31, 2020, the Tranche 2 Loan will be requested no later than June 30, 2021 and the Tranche 3 Loan will be requested no later than December 31, 2021, in each case, subject to customary terms and conditions, including, in the case of the Tranche 2 Loan and Tranche 3 Loan, either (a) the first sale of inclisiran in the U.S. for end use or consumption after FDA regulatory approval thereof or (b) revenue attributable to ONPATTRO and GIVLAARI equal to or greater than \$300.0 million as of the last day of the most recently ended twelve month period, referred to as the Subsequent Borrowing Conditions. In the event the Subsequent Borrowing Conditions are not satisfied as of the dates set forth in the table above, the Tranche 2 Loan and Tranche 3 Loan will be funded if such Subsequent Borrowing Conditions are satisfied on or prior to December 31, 2022. The Term Loans mature seven years from the date the Tranche 1 Loan is funded, referred to as the Tranche 1 Funding Date. We can elect an interest rate of either LIBOR plus 7%, subject to a floor of 1%, or a base rate plus 6%, subject to a floor of 2%. We may, at our option, pay interest in kind on interest due within a three-year period beginning on the Tranche 1 Funding Date at a rate that is 1% higher than the interest rate otherwise applicable to such Term Loan. On the date any Tranche 1 Loan, Tranche 2 Loan or Tranche 3 Loan is funded, we will pay a funding fee equal to 2.5% of the principal amount of the Term Loans funded on such date. In addition, we will pay an exit fee equal to 1% of the commitments in respect of the Term Loans, payable upon any repayment of the Term Loans or termination of the unfunded Term Loan commitments.

We are obligated to pay interest due on the Term Loans for a two-year period beginning on the Tranche 1 Funding Date which will be calculated without regard to the Term Loans being prepaid or an unfunded tranche being terminated during this period (in whole or in part). Any prepayments of Term Loans or terminations of unfunded tranches that occur between 2 to 5 years from the Tranche 1 Funding Date are subject to a fee of up to 5% of the loan principal that is prepaid or the amount of the unfunded tranche that is terminated.

All obligations under the Credit Agreement are secured, subject to certain exceptions, by security interests in the following assets: (1) intellectual property owned by us relating to ONPATTRO, GIVLAARI and vutrisiran, (2) the equity interests held by the Loan Parties in their subsidiaries, (3) all of our ownership of the inclisiran royalty remaining after the royalty purchase under the Purchase Agreement, and (4) material real property, and certain personal property, including, without limitation, cash held in certain deposit accounts of the Loan Parties and equipment.

The Credit Agreement contains negative covenants that, among other things and subject to certain exceptions, could restrict our ability to, incur additional liens, incur additional indebtedness, make investments, including acquisitions, engage in fundamental changes, sell or dispose of assets that constitute collateral, including certain intellectual property, pay dividends or make any distribution or payment on or redeem, retire or purchase any equity interests, amend, modify or waive certain material agreements or organizational documents and make payments of certain subordinated indebtedness. Additionally, the Credit Agreement contains certain customary representations and warranties, affirmative covenants and provisions relating to events of default, including nonpayment of principal, interest and other amounts; failure to comply with covenants; the rendering of judgments or orders or default by us in respect of other material indebtedness; and certain insolvency and ERISA events. The Credit Agreement also requires us to have consolidated liquidity of at least \$100.0 million as of the last day of each fiscal quarter. As of September 30, 2020, we were in compliance with the applicable terms and conditions of the covenants under the Credit Agreement. No later than December 31, 2020, we will draw the Tranche 1 Loan based on the terms of the Credit Agreement. As of September 30, 2020, we had not yet drawn down on the Term Loans.

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10. DEVELOPMENT DERIVATIVE LIABILITY

In August 2020, we entered into a co-development agreement, referred to as the Funding Agreement, with BXLS V Bodyguard – PCP L.P. and BXLS Family Investment Partnership V – ESC L.P., collectively referred to as Blackstone Life Sciences, pursuant to which Blackstone Life Sciences will provide up to \$150.0 million in funding for the clinical development of vutrisiran and ALN-AGT, two of our cardiometabolic programs. With respect to vutrisiran, Blackstone Life Sciences has committed to provide up to \$70.0 million to fund development costs related to the HELIOS-B Phase 3 clinical trial. In addition, Blackstone Life Sciences has the right, but is not obligated, to fund up to \$26.0 million for development costs related to a Phase 2 clinical trial of ALN-AGT and up to \$54.0 million for development costs related to a Phase 3 clinical trial of ALN-AGT. The amount of funding ultimately provided by Blackstone Life Sciences is dependent on us achieving specified development milestones with respect to each clinical trial. We retain sole responsibility for the development and commercialization of both vutrisiran and ALN-AGT.

As consideration for Blackstone Life Sciences's funding for vutrisiran clinical development costs, we have agreed to pay Blackstone Life Sciences a 1% royalty on net sales of vutrisiran for a 10-year term beginning upon the first commercial sale following regulatory approval of vutrisiran for ATTR-cardiomyopathy, as well as fixed payments of up to 2.5 times their investment over a two-year period upon regulatory approval of vutrisiran for ATTR-cardiomyopathy in specified countries, unless it is later withdrawn from the market following a mandatory recall. As consideration for Blackstone Life Sciences's funding for Phase 2 clinical development costs of ALN-AGT, we have agreed to pay Blackstone Life Sciences fixed payments of up to 3.25 times their Phase 2 investment over a four-year period upon the successful completion of the ALN-AGT Phase 2 clinical trial, unless certain regulatory events affecting the continued development of ALN-AGT occur. As consideration for Blackstone Life Sciences's funding for Phase 3 clinical development costs of ALN-AGT, we have agreed to pay Blackstone Life Sciences fixed payments of up to 4.5 times their Phase 3 investment over a four-year period upon regulatory approval of ALN-AGT in specified countries, unless it is later withdrawn from the market following a mandatory recall.

Our payment obligations under the Funding Agreement will be secured, subject to certain exceptions, by security interests in intellectual property owned by us relating to vutrisiran and ALN-AGT, as well as in our bank account in which the funding deposits will be made.

We and Blackstone Life Sciences each have the right to terminate the Funding Agreement in its entirety in the event of the other party's bankruptcy or similar proceedings. We and Blackstone Life Sciences may each terminate the Funding Agreement in its entirety or with respect to either product in the event of an uncured material breach by the other party, or with respect to a product for certain patient health and safety reasons, or if regulatory approval in specified major market countries is not obtained for the product following the completion of clinical trials for the product. In addition, Blackstone Life Sciences has the right to terminate the Funding Agreement in its entirety upon the occurrence of certain events affecting our ability to make payments under the agreement or to develop or commercialize the products, or upon a change of control of us. Blackstone Life Sciences may also terminate the Funding Agreement with respect to a product if the joint steering committee elects to terminate the development program for that product in its entirety, if certain clinical endpoints are not achieved for that product or, with respect to vutrisiran only, if our right to develop or commercialize vutrisiran is enjoined in a specified major market as a result of an alleged patent infringement. In certain termination circumstances, we will be obligated to pay Blackstone Life Sciences an amount that is equal to, or a multiplier of, the development funding received from Blackstone Life Sciences, and we may remain obligated under certain circumstances to make the payments to Blackstone Life Sciences described above, or the royalty described above in the case of vutrisiran, should we obtain regulatory approval for vutrisiran or ALN-AGT following termination.

We account for the Funding Agreement under ASC 815 as a derivative liability, measured at fair value, within other liabilities on our condensed consolidated balance sheets. The liability was initially recorded at \$4.2 million upon receipt of funding pursuant to the contractual terms. The change in fair value due to the remeasurement of the development derivative liability resulted in a \$1.2 million loss for the three and nine months ended September 30, 2020, recorded as other expense on our condensed consolidated statements of operations and comprehensive loss.

As of September 30, 2020, the derivative liability is classified as a Level 3 financial liability in the fair value hierarchy. The valuation method incorporates certain unobservable Level 3 key inputs including (i) the probability and timing of achieving stated development milestones to receive payments from Blackstone Life Sciences, (ii) the probability and timing of achieving regulatory approval and payments to Blackstone Life Sciences, (iii) an estimate of the amount and timing of the royalty payable on net sales of vutrisiran, assuming regulatory approval, (iv) our cost of borrowing (17%), and (v) Blackstone Life Sciences's cost of borrowing (4%).

The following table presents the activity with respect to the development derivative liability, in thousands:

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Development derivative liability as of August 15, 2020	\$	—
Amount received under the Funding Agreement		4,200
Loss recorded from remeasurement of development derivative liability		1,230
Development derivative liability as of September 30, 2020	\$	5,430

11. EQUITY

Blackstone Equity Placement

On April 10, 2020, we entered into a stock purchase agreement, or Investors SPA, with certain affiliates of The Blackstone Group Inc., or Investors, pursuant to which we sold 963,486 shares of our common stock to the Investors for aggregate cash consideration of \$100.0 million, or \$103.79 per share, as part of the broad strategic financing collaboration with The Blackstone Group Inc. The Investors SPA contains customary representations, warranties, and covenants of each of the parties thereto.

Regeneron Equity Placement

On April 8, 2019, we executed a stock purchase agreement with Regeneron, or the Regeneron SPA, to sell 4,444,445 shares of our common stock for aggregate cash consideration of \$400.0 million, or \$90.00 per share, which we refer to as the Equity Transaction.

Under the terms of the Regeneron SPA, if at the time of closing of the Equity Transaction, a sufficient number of authorized shares of common stock under our Restated Certificate of Incorporation was not available, the \$400.0 million of equity under the Regeneron SPA would instead have been issued in the form of 1,481,482 shares of our Series A redeemable convertible preferred stock, par value \$0.01 per share, at a purchase price of \$270.00 per share, that would have converted automatically into common stock on a 1-for-3 basis upon stockholder approval of additional authorized shares of common stock. The Regeneron SPA contains customary representations, warranties and covenants of each of the parties thereto.

On April 25, 2019, following the receipt of stockholder approval at our 2019 annual meeting, a Certificate of Amendment was filed to our Restated Certificate of Incorporation to increase the number of authorized shares of common stock from 125,000,000 to 250,000,000 shares, providing for a sufficient number of authorized shares of common stock available to be issued to Regeneron pursuant to the Equity Transaction. On May 21, 2019, subsequent to the expiration of the applicable pre-merger waiting period under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended, Regeneron purchased 4,444,445 shares of our common stock for aggregate cash consideration of \$400.0 million.

Because we had an obligation to Regeneron as of April 8, 2019 that may have resulted in the issuance of redeemable convertible preferred stock, we were required to follow the guidance in ASC 480 and mark-to-market the obligation to potentially issue this redeemable security until April 25, 2019, when it became known that the obligation would be fulfilled in common stock. The final mark-to-market adjustment of this obligation under ASC 480 resulted in us recording a gain of \$9.4 million included in other income in the consolidated statements of comprehensive loss during the nine months ended September 30, 2019, with the offsetting adjustment to equity netting against the \$400.0 million proceeds that were received upon closing.

Public Offering

In January 2019, 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 \$77.50 per share. As a result of the offering, we received aggregate net proceeds of \$381.9 million after deducting underwriting discounts and commissions and other offering expenses of approximately \$5.6 million.

12. STOCK-BASED COMPENSATION

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

(In thousands)	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
Research and development	\$ 13,703	\$ 22,737	\$ 45,542	\$ 54,144
Selling, general and administrative	23,561	23,272	60,055	54,500
Total	\$ 37,264	\$ 46,009	\$ 105,597	\$ 108,644

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(Unaudited)

13. 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 during the period. 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 outstanding during the period. Potential common shares consist of shares issuable upon the exercise of stock options (the proceeds of which are then assumed to have been used to repurchase outstanding shares 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 common share equivalents were excluded from the calculation of net loss per common share because their inclusion would be anti-dilutive:

(In thousands)	As of September 30,	
	2020	2019
Options to purchase common stock	11,856	13,675
Unvested restricted common stock	1,145	668
Total	13,001	14,343

14. COMMITMENTS AND CONTINGENCIES

Legal Matters

From time to time, we may be a party to litigation, arbitration or other legal proceedings in the course of our business, including the matters 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 products or 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 or breach our license or other agreements with such third parties. 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.

In June 2018, Ionis Pharmaceuticals, Inc., or Ionis, claimed it was owed payments under our second amended and restated strategic collaboration and license agreement as a result of the January 2018 restructuring of our Sanofi Genzyme collaboration and the related Exclusive TTR License and AT3 License Terms. We disputed this and in November 2018, Ionis filed a Demand for Arbitration with the American Arbitration Association against us. The hearing portion of the arbitration process was completed in June 2020, and in October 2020, a partial award was issued by the arbitration panel. For the three and nine months ended September 30, 2020, we increased our estimated contingent liability related to our arbitration with Ionis by \$28 million due to the issuance of this partial award by the arbitration panel. Prior to the third quarter of 2020, we had accrued a de minimis amount in connection with this matter. As of November 4, 2020, the arbitration panel had not yet determined the amount of damages to be awarded. As additional information becomes available, or based on specific events such as the final outcome of the arbitration, we may reassess the contingent liability related to this matter and may revise this estimate, which could have an impact on our operating results.

Securities Litigation

On September 26, 2018, Caryl Hull Leavitt, individually and on behalf of all others similarly situated, filed a class action complaint for violation of federal securities laws against us, our Chief Executive Officer and our former Chief Financial Officer in the United States District Court for the Southern District of New York. By stipulation of the parties and Order of the Court dated November 20, 2018, the action was transferred to the United States District Court for the District of Massachusetts. On May 8, 2019, the Court entered an order appointing a lead plaintiff, and on July 3, 2019, lead plaintiff filed a consolidated class action complaint, or the Complaint. In addition to the originally named defendants, the Complaint also named as defendants certain of our other executive officers, and purported to be brought on behalf of a class of persons who acquired our securities between September 20, 2017 and September 12, 2018 and sought to recover damages caused by defendants' alleged violations of the federal securities laws and to pursue remedies under Sections 10(b) and 20(a) of the Securities Exchange Act of 1934, as amended, and Rule 10b-5 promulgated thereunder. The Complaint alleged, among other things, that the defendants made materially false and misleading statements related to the efficacy and safety of our product, ONPATTRO. The plaintiff sought, among other things, the designation of this action as a class action, an award of unspecified compensatory damages, interest, costs and expenses, including counsel fees and expert fees, and other relief as the court deems appropriate. All defendants filed a motion to dismiss the Complaint in its entirety on July 31, 2019. On March 23, 2020, the Court granted our motion and dismissed the Complaint without prejudice. Pursuant to a prior Order of the Court, on June 1, 2020, plaintiff filed a motion

ALNYLAM PHARMACEUTICALS, INC.
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seeking leave to file a further amended complaint. That motion was fully briefed on June 22, 2020, and remains pending with the Court.

On September 12, 2019, the Chester County Employees Retirement Fund, individually and on behalf of all others similarly situated, filed a purported securities class action complaint for violation of federal securities laws against us, certain of our current and former directors and officers, and the underwriters of our November 14, 2017 public stock offering, in the Supreme Court of the State of New York, New York County. On November 7, 2019, plaintiff filed an amended complaint, or the New York Complaint. The New York Complaint is brought on behalf of an alleged class of those who purchased our securities pursuant and/or traceable to our November 14, 2017 public stock offering. The New York Complaint purports to allege claims arising under Sections 11, 12(a)(2) and 15 of the Securities Act of 1933, as amended, and generally alleges that the defendants violated the federal securities laws by, among other things, making material misstatements or omissions concerning the results of our APOLLO Phase 3 clinical trial of patisiran. The plaintiff seeks, among other things, the designation of the action as a class action, an award of unspecified compensatory damages, rescissory damages, interest, costs and expenses, including counsel fees and expert fees, and other relief as the court deems appropriate. All defendants filed a joint motion to dismiss the New York Complaint in its entirety on December 20, 2019. On November 2, 2020, the Court entered a Decision and Order denying defendants' motion to dismiss.

We believe that the allegations contained in the complaints are without merit and intend to defend the cases vigorously. We cannot predict at this point the length of time that these actions will be ongoing or the liabilities, if any, which may arise therefrom.

15. DEFINED BENEFIT PLANS

We maintain defined benefit plans for employees in certain countries outside the U.S., including retirement benefit plans required by applicable local law. The unfunded benefit obligation corresponds to the projected benefit obligations of which the discounted net present value is calculated based on years of employment, expected salary increases and pension adjustments, offset by the fair value of the assets held by plan. The unfunded benefit obligation was approximately \$4.3 million as of September 30, 2020 and December 31, 2019, and is recorded in other liabilities on the condensed consolidated balance sheet. The total net periodic benefit cost for the three and nine months ended September 30, 2020 and 2019 was not material.

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

Overview

We are a global commercial-stage biopharmaceutical company developing novel therapeutics based on RNA interference, or RNAi. RNAi is a naturally occurring biological pathway within cells for sequence-specific silencing and regulation of gene expression. By harnessing the RNAi pathway, we have developed a new class of innovative medicines, known as RNAi therapeutics. RNAi therapeutics are comprised of small interfering RNA, or siRNA, and function upstream of conventional medicines by potently silencing messenger RNA, or mRNA, that encode for disease-causing proteins, thus preventing them from being made. We believe this is a revolutionary approach with the potential to transform the care of patients with genetic and other diseases. To date, our efforts to advance this revolutionary approach have yielded the approval of two first-in-class RNAi-based medicines, ONPATTRO® (patisiran) and GIVLAARI® (givosiran).

Our research and development strategy is to target genetically validated genes that have been implicated in the cause or pathway of human disease. We utilize a lipid nanoparticle (LNP) or N-acetylgalactosamine (GalNAc) conjugate approach to enable hepatic delivery of siRNAs. For delivery to the central nervous system, or CNS, and the eye (ocular delivery), we are utilizing an alternative conjugate approach. Our focus is on clinical indications where there is a high unmet need, 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.

We continue to execute on our *Alynlyam 2020* strategy of building a multi-product, global, commercial biopharmaceutical company with a deep and sustainable clinical pipeline of RNAi therapeutics for future growth and a robust, organic research engine for sustainable innovation and great potential for patient impact. Based on our accomplishments to-date, we are confident we will achieve our *Alynlyam 2020* goals by the end of 2020. Specifically, our broad pipeline of investigational RNAi therapeutics is focused in four Strategic Therapeutic Areas, or "STArS:" Genetic Medicines; Cardio-Metabolic Diseases; Hepatic Infectious Diseases; and CNS/Ocular Diseases. We now have two marketed products that are within the Genetic Medicines STAr, ONPATTRO and GIVLAARI. ONPATTRO is approved by the United States Food and Drug Administration, or FDA, for the treatment of the polyneuropathy of hereditary transthyretin-mediated amyloidosis, or hATTR amyloidosis, in adults and has also been approved in the European Union, or EU, for the treatment of hATTR amyloidosis in adult patients with stage 1 or stage 2 polyneuropathy, Japan for the treatment of transthyretin, or TTR, type familial amyloidosis with polyneuropathy, and in several additional countries, including Brazil. Regulatory filings in other territories are pending and additional filings are planned for the remainder of 2020 and beyond. GIVLAARI is approved by the FDA for the treatment of adults with acute hepatic porphyria, or AHP, and in March 2020, GIVLAARI was granted marketing authorisation by the European Commission, or EC, for the treatment of AHP in adults and adolescents aged 12 years and older. In July 2020, we received marketing authorisation approval for GIVLAARI in Brazil for the treatment of AHP in adults and in October 2020, we received regulatory approval for GIVLAARI in Canada for the treatment of AHP in adult patients. We have also filed for regulatory approval for givosiran (the non-branded drug name for GIVLAARI) in Switzerland and Japan and additional regulatory filings are pending or planned for the remainder of 2020 and beyond.

We have six late-stage investigational programs, advancing toward potential commercialization. These programs include our wholly owned programs: givosiran for the treatment of adolescent patients with AHP, lumasiran for the treatment of primary hyperoxaluria type 1, or PH1, patisiran (the non-branded drug name for ONPATTRO) for the treatment of transthyretin amyloidosis, or ATTR amyloidosis, with cardiomyopathy, and vutrisiran for the treatment of ATTR amyloidosis. Inclisiran for the treatment of hypercholesterolemia and atherosclerotic cardiovascular disease, or ASCVD, is being advanced by our partner, The Medicines Company (acquired by Novartis AG in January 2020), or MDCO, and fitusiran for the treatment of hemophilia is being advanced by our partner Sanofi Genzyme, the specialty care global business unit of Sanofi.

In December 2019, we reported positive topline results from our ILLUMINATE-A Phase 3 clinical trial for lumasiran, our investigational RNAi therapeutic targeting glycolate oxidase, for the treatment of PH1, and in September 2020, we reported positive topline results from our ILLUMINATE-B Phase 3 clinical trial for lumasiran for the treatment of PH1 in children under the age of six. Based on the data from the ILLUMINATE-A study, in April 2020, we submitted a New Drug Application, or NDA, which was accepted by the FDA and granted Priority Review. The FDA has set an action date of December 3, 2020 under the Prescription Drug User Fee Act, and indicated that they were not currently planning an advisory committee meeting as part of the NDA review. Additionally, in March 2020, we submitted a marketing authorisation application, or MAA, for lumasiran with the European Medicines Agency, or EMA, which has been validated by the EMA. Lumasiran was previously granted an accelerated assessment by the EMA. In October 2020, we announced that the Committee for Medicinal Products for Human Use, or CHMP, adopted a positive opinion recommending marketing authorisation of lumasiran for the treatment of PH1. If approved by the EC, lumasiran will be marketed in Europe under the brand name OXLUMO. The CHMP positive opinion was based on an evaluation of the effects of lumasiran in patients with PH1 and its safety profile as demonstrated in both our ILLUMINATE-A and ILLUMINATE-B Phase 3 studies. We expect a decision from the EC on the authorisation recommended by CHMP for lumasiran in the fourth quarter of 2020.

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 Regeneron Pharmaceuticals, Inc., or Regeneron, MDCO, Sanofi Genzyme, Vir Biotechnology, Inc., or Vir, and Dicerna Pharmaceuticals, Inc., or Dicerna.

In March 2020, we announced an expansion of our exclusive licensing agreement with Vir for the development and commercialization of RNAi therapeutics for infectious diseases to include the development and commercialization of RNAi therapeutics targeting SARS-CoV-2, the virus that causes the disease COVID-19. In April 2020, we further expanded our collaboration with Vir to include up to three human host factor targets relating to susceptibility to coronaviruses, for use in connection with the treatment, palliation, diagnosis or prevention of SARS-CoV-2 and other diseases caused by coronaviruses.

In April 2020, we and Dicerna formed a development and commercialization collaboration on investigational RNAi therapeutics for the treatment of alpha-1 antitrypsin deficiency-associated liver disease, or alpha-1 liver disease. In addition, in April 2020, we and Dicerna entered into a Patent Cross-License Agreement, pursuant to which each party agreed to cross-license its respective intellectual property related to our lumasiran and Dicerna's nedosiran investigational programs for the treatment of primary hyperoxaluria.

In April 2020, we entered into a strategic financing collaboration with certain affiliates of The Blackstone Group Inc., or Blackstone, to accelerate our advancement of RNAi therapeutics. In connection with the collaboration, Blackstone will provide us up to \$2.00 billion in financing, including \$1.00 billion in committed payments to acquire 50% of royalties and 75% of commercial milestones payable to us in connection with sales of inclisiran, up to \$750.0 million in a first lien senior secured term loan, and up to \$150.0 million towards the development of vutrisiran and ALN-AGT pursuant to the agreement finalized in August 2020 and described below. As part of the strategic financing collaboration, Blackstone also purchased an aggregate of \$100.0 million of our common stock.

In August 2020, we entered into the agreement, or the Funding Agreement, with BXLS V Bodyguard – PCP L.P. and BXLS Family Investment Partnership V – ESC L.P., collectively referred to as Blackstone Life Sciences, pursuant to which Blackstone Life Sciences will provide up to \$150.0 million in funding for the clinical development of vutrisiran and ALN-AGT. Blackstone Life Sciences has committed to provide up to \$70.0 million to fund development costs related to the HELIOS-B Phase 3 clinical trial for vutrisiran. In addition, Blackstone Life Sciences has the right, but is not obligated, to fund up to \$26.0 million for development costs related to a Phase 2 clinical trial of ALN-AGT and up to \$54.0 million for development costs related to a Phase 3 clinical trial of ALN-AGT. We retain sole responsibility for the development and commercialization of both vutrisiran and ALN-AGT. Please read Note 5 and Note 10 to our condensed consolidated financial statements included in Part I, Item 1, “Financial Statements (Unaudited),” of this Quarterly Report on Form 10-Q for additional details on our transaction with Blackstone.

We have incurred significant losses since we commenced operations in 2002 and expect such losses to continue for the foreseeable future. As of September 30, 2020, we had an accumulated deficit of \$4.34 billion. Historically, we have generated losses principally from costs associated with the establishment of late-stage clinical and commercial capabilities, including global commercial operations, research and development activities, acquiring, filing and expanding intellectual property rights, and selling, general and administrative costs. While we believe 2019 was our peak net loss year, and believe the funding provided by our strategic financing collaboration with Blackstone should enable us to achieve a self-sustainable financial profile without the need for future equity financing, we expect to continue to incur annual net operating losses for the foreseeable future as we expand our efforts to discover, develop and commercialize RNAi therapeutics. We also anticipate that our operating results will fluctuate for the foreseeable future. Therefore, period-to-period comparisons should not be relied upon as predictive of the results in future periods.

We currently have programs focused on a number of therapeutic areas and as of September 30, 2020, we are generating net revenue from product sales for two marketed products, ONPATTRO and GIVLAARI. However, our ongoing development efforts may not be successful and we may not be able to commence sales of any other products and/or successfully market and sell ONPATTRO, GIVLAARI or any other approved products in the future. A substantial portion of our total revenues in recent years has been derived from collaboration revenues from strategic alliances with Regeneron, Sanofi Genzyme and MDCO. In addition to revenues from the commercial sales of ONPATTRO and GIVLAARI and potentially from sales of future products, we expect our sources of potential funding for the next several years to continue to be derived in part from existing and new strategic alliances, which may include license and other fees, funded research and development, milestone payments and royalties on product sales by our licensees, as well as funding due or available to us under our strategic financing collaboration with Blackstone.

The COVID-19 Pandemic

In March 2020, the World Health Organization declared the outbreak of a novel strain of coronavirus, or COVID-19, as a pandemic, which continues to spread or resurge throughout the U.S. and worldwide. We could be materially and adversely affected by the risks, or the public perception of the risks, related to an epidemic, pandemic, outbreak, or other public health crisis, such as the current COVID-19 pandemic. We are continuing to monitor the global pandemic and spread of COVID-19 and plan to continue taking steps to identify and mitigate the adverse impacts on, and risks to, our business posed by its spread

and actions taken by governmental and health authorities to address the COVID-19 pandemic. The spread of COVID-19 has caused us to modify our business practices, including implementing a global work from home policy for all employees who are able to perform their duties remotely and restricting all nonessential business travel, and we expect to continue to take actions as may be required or recommended by government authorities or as we determine are in the best interests of our employees, the patients we serve and other business partners in light of COVID-19. In September 2020, we initiated a voluntary program that allowed certain employees to return to physical locations in some geographies, including in the U.S. and certain countries in Europe, in accordance with local government laws, regulations and restrictions and our own safety procedures and practices. Our office sites are equipped and operational with physical distancing, temperature screening, contact tracing and cleaning measures in place, and we expect to adopt and implement additional precautions commensurate with any expansion of employees returning to our physical locations. At this time, we cannot predict when certain restrictions that are in place to protect our employees can be safely reduced or will no longer be needed. Given the fluidity of the COVID-19 pandemic and the uncertainty on whether a second wave of the COVID-19 pandemic will occur during the remainder of 2020 or in 2021, we do not yet know the full extent of the impact of COVID-19 on our business operations. The ultimate extent of the impact of any epidemic, pandemic, outbreak, or other public health crisis on our business, financial condition and results of operations will depend on future developments, which are highly uncertain and cannot be predicted, including new information that may emerge concerning the severity of such epidemic, pandemic, outbreak, or other public health crisis and actions taken to contain or prevent the further spread, among others. Accordingly, we cannot predict the extent to which our business, financial condition and results of operations will be affected. We remain focused on maintaining a strong balance sheet, liquidity and financial flexibility and continue to monitor developments as we deal with the disruptions and uncertainties from a business and financial perspective relating to COVID-19. We will continue to work diligently with our partners and stakeholders to continue supporting patient access to our approved medicines, advancing our product candidates under regulatory review as well as in our clinical studies to the extent safe to do so for patients, caregivers and healthcare practitioners, and ensuring the continuity of our manufacturing and supply chain. For additional information related to the actual or potential impacts of COVID-19 on our business, please read Part II, Item 1A, “Risk Factors” of this Quarterly Report on Form 10-Q.

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 clinical development programs, which includes multiple programs in late-stage development.

Our broad pipeline, including two approved products and multiple investigational RNAi therapeutics across all stages of development, is focused in four STArS: Genetic Medicines; Cardio-Metabolic Diseases; Hepatic Infectious Diseases; and CNS/Ocular Diseases.

Commercial Products and Late-Stage Clinical Development Pipeline

The chart below is a summary of our commercial products and late-stage development programs as of November 4, 2020. It identifies those programs for which we have received marketing approval, those programs for which we have received Breakthrough Therapy Designation from the FDA, the stage of these programs and our commercial rights to such programs:

Alnylam Commercial Products and Late Stage Clinical Development Pipeline

Focused in 4 Strategic Therapeutic Areas (STAs):		BREAKTHROUGH DESIGNATION	LATE STAGE (Phase 2-Phase 3)	REGISTRATION	COMMERCIAL	COMMERCIAL RIGHTS
	Genetic Medicines					
	Cardio-Metabolic Diseases					
	Infectious Diseases					
	CNS/Ocular Diseases					
	hATTR Amyloidosis ¹					Global
	Acute Hepatic Porphyria ²					Global
Lumasiran	Primary Hyperoxaluria Type 1					Global
Inclisiran	Hypercholesterolemia					Milestones & up to 20% Royalties ³ (Novartis)
Patisiran	ATTR Amyloidosis Label Expansion					Global
Fitusiran	Hemophilia and Rare Bleeding Disorders					15-30% Royalties (Sanofi)
Vutrisiran	ATTR Amyloidosis					Global

¹ Approved in the U.S. and Canada for the polyneuropathy of hATTR amyloidosis in adults, in the EU, Switzerland and Brazil for the treatment of hATTR amyloidosis in adults with stage 1 or stage 2 polyneuropathy, and in Japan for the treatment of transthyretin (TTR) type familial amyloidosis with polyneuropathy

² Approved in the U.S. and Brazil for the treatment of adults with acute hepatic porphyria (AHP), and in the EU for the treatment of AHP in adults and adolescents aged 12 years and older

³ As part of Blackstone strategic financing collaboration, 50% of inclisiran royalty revenue will be payable to Blackstone

Early-Stage Clinical Development Pipeline

The chart below is a summary of our early-stage development programs as of November 4, 2020. It 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 stage of these programs, and our commercial rights to such programs, as well as programs which we believe could result in an IND or CTA filing in 2020:

Alnylam Early Stage Clinical Development and 2020 IND Pipeline

Focused in 4 Strategic Therapeutic Areas (STAs):		HUMAN POC ¹	BREAKTHROUGH DESIGNATION	2020 IND CANDIDATES	EARLY STAGE (Phase 1-Phase 2)	COMMERCIAL RIGHTS
	Genetic Medicines					
	Cardio-Metabolic Diseases					
	Infectious Diseases					
	CNS/Ocular Diseases					
Cemdisiran	Complement-Mediated Diseases					50-50 (Regeneron)
Cemdisiran/Pozelimab Combo²	Complement-Mediated Diseases					Milestone/Royalty (Regeneron)
ALN-AAT02 (DCR-A1AT)³	Alpha-1 Liver Disease					Ex-U.S. option post-Phase 3 (Dicerna)
ALN-HBV02 (VIR-2218)	Hepatitis B Virus Infection					50-50 option post-Phase 2 (Vir)
ALN-AGT	Hypertension					Global
ALN-HSD	NASH					50-50 (Regeneron)

¹ POC, proof of concept – defined as having demonstrated target gene knockdown and/or additional evidence of activity in clinical studies

² Cemdisiran is currently in Phase 2 development and pozelimab is currently in Phase 1 development; Alnylam and Regeneron are evaluating potential combinations of these two investigational therapeutics

³ Dicerna is leading and funding development of ALN-AAT02 and DCR-A1AT and will select which candidate to advance in development

During the third quarter of 2020 and recent period, we reported the following updates from ONPATTRO and GIVLAARI commercialization and our late-stage clinical programs:

Commercial

ONPATTRO

- We achieved ONPATTRO global net product revenues for the third quarter of 2020 of \$82.5 million, continued progress with market access efforts with a recent launch in Portugal, and continued global expansion with achievement of regulatory approval in Israel.

GIVLAARI

- We achieved GIVLAARI global net product revenues for the third quarter of 2020 of \$16.7 million, continued progress with market access efforts with ongoing launch in Germany, and continued global expansion with approval in Canada and submission of a new drug application in Japan.

Late-Stage Clinical Development

- We continued to advance patisiran, in development for the treatment of the cardiomyopathy of both hereditary and wild-type ATTR amyloidosis, and continued enrollment in the APOLLO-B Phase 3 study in ATTR amyloidosis patients with cardiomyopathy.
- We presented new interim data from the Phase 1/2 open-label extension study of givosiran in AHP.
- We continued to advance lumasiran for the treatment of PH1:
 - Received a positive CHMP opinion from the EMA recommending approval of lumasiran for the treatment of PH1 in patients of all ages;
 - Received a positive scientific opinion from the UK's Medicines and Healthcare Products Regulatory Agency through the Early Access to Medicines Scheme;
 - Presented positive complete results from ILLUMINATE-B, a global Phase 3 pediatric study of lumasiran in PH1 patients less than six years of age, including infants, with preserved renal function; and
 - Continued enrollment in the ILLUMINATE-C Phase 3 study of lumasiran for the treatment of advanced PH1 in patients of all ages.
- We continued to advance vutrisiran, a subcutaneously administered investigational RNAi therapeutic in development for the treatment of ATTR amyloidosis:
 - Continued treating patients in the fully enrolled HELIOS-A Phase 3 study of vutrisiran in hATTR amyloidosis patients with polyneuropathy, and remain on track to report topline results in early 2021; and
 - Continued enrollment in the HELIOS-B Phase 3 study in ATTR amyloidosis patients with cardiomyopathy.
- Inclisiran continued to advance under our partner, MDCO (which was acquired by Novartis AG in January 2020), and is undergoing review for approval in the U.S. and EU:
 - Received a positive CHMP opinion from the EMA recommending approval of inclisiran for the treatment of adults with hypercholesterolemia or mixed dyslipidemia. If approved, inclisiran will be marketed under the brand name LEQVIO®.
- Our partner, Sanofi Genzyme, continued advancement of the ATLAS Phase 3 program for fitusiran in patients with hemophilia A or B with and without inhibitors.

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. Moreover, there are uncertainties specific to any new field of drug discovery, including RNAi. The success of ONPATTRO, GIVLAARI or any other product candidate we develop is highly uncertain. Due to the numerous risks associated with developing drugs, including those risks associated with the COVID-19 pandemic, we cannot reasonably estimate or know the nature, timing and estimated costs of the efforts necessary to complete the development of any potential product candidate or indication, or the period, if any, in which material net cash inflows will commence from any approved product or indication. Any failure to complete any stage of the development of any potential products or any approved product for an expanded indication in a timely manner or successfully launch, market and sell any approved product, including ONPATTRO and GIVLAARI, 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 research and development programs within the planned timeline, 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 four 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 ourselves and our collaborators in the advancement of RNAi therapeutics as a new class of innovative medicines. Specifically, with respect to our CNS/Ocular Disease pipeline, in April 2019, we entered into a global, strategic collaboration with Regeneron to discover, develop and commercialize RNAi therapeutics for a broad range of diseases by addressing disease targets expressed in the eye and CNS, in addition to a select number of targets expressed in the liver. In July 2020, Regeneron exercised its co-development/co-commercialization option on our first CNS-targeted development candidate, ALN-APP, an investigational RNAi therapeutic in development for the treatment of hereditary cerebral amyloid angiopathy and autosomal dominant Alzheimer's Disease, which we will lead.

With respect to our Cardio-Metabolic pipeline, in March 2013, we entered into an exclusive, worldwide license with MDCO (acquired by Novartis AG in January 2020) pursuant to which MDCO was granted the right to develop, manufacture and commercialize RNAi therapeutics targeting PCSK9 for the treatment of hypercholesterolemia and other human diseases, including inclisiran. In March 2018, we entered into a discovery collaboration with Regeneron to identify RNAi therapeutics for nonalcoholic steatohepatitis, or NASH, and potentially other related diseases, and in November 2018, we and Regeneron entered into a separate, fifty-fifty collaboration to further research, co-develop and commercialize any therapeutic product candidates that emerge from these discovery efforts. In April 2020, we entered into a development and commercialization collaboration with Dicerna to advance investigational RNAi therapeutics for the treatment of alpha-1 liver disease.

With respect to our Hepatic Infectious Disease pipeline, in October 2017, we announced an exclusive licensing agreement with Vir for the development and commercialization of RNAi therapeutics for infectious diseases, including chronic hepatitis B virus, or HBV, infection. In March 2020, we announced an expansion of our exclusive licensing agreement with Vir to include the development and commercialization of RNAi therapeutics targeting SARS-CoV-2, the virus that causes the disease COVID-19. In April 2020, we further expanded our broad multi-target existing collaboration for the development and commercialization of RNAi therapeutics for infectious diseases to include up to three additional targets focused on host factors for SARS-CoV-2, including angiotensin converting enzyme-2, or ACE2, and transmembrane protease, serine 2, or TMPRSS2.

With respect to our Genetic Medicine pipeline, we formed a broad strategic alliance with Sanofi Genzyme in 2014. In January 2018, we and Sanofi Genzyme amended our 2014 collaboration and entered into the Exclusive License Agreement, referred to as the Exclusive TTR License, under which we have the exclusive right to pursue the further global development and commercialization of all TTR products, including ONPATTRO, vutrisiran and any back-up products, and the ALN-AT3 Global License Terms, referred to as the AT3 License Terms, under which Sanofi Genzyme has the exclusive right to pursue the further global development and commercialization of fitusiran and any back-up products. In April 2019, we and Sanofi Genzyme agreed to further amend the 2014 Sanofi Genzyme collaboration to conclude the research and option phase and to amend and restate the AT3 License Terms to modify certain of the business terms.

Critical Accounting Policies and Estimates

Liability Related to the Sale of Future Royalties

In April 2020, we entered into a purchase and sale agreement with Blackstone, prompting our adoption of a new accounting policy associated with the liability related to the sale of future royalties. Please read Note 2 and Note 5 to our condensed consolidated financial statements included in Part I, Item 1, "Financial Statements (Unaudited)," of this Quarterly Report on Form 10-Q for a discussion of the policy and the accounting implications of this agreement, respectively.

Development Derivative Liability

In August 2020, we entered into the Funding Agreement with Blackstone Life Sciences, prompting our adoption of a new accounting policy associated with the development derivative liability. Please read Note 2 and Note 10 to our condensed consolidated financial statements included in Part I, Item 1, "Financial Statements (Unaudited)," of this Quarterly Report on Form 10-Q for a discussion of the policy and the accounting implications of this agreement, respectively.

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, 2019, which we filed with the SEC on February 13, 2020. There have been no significant changes to our critical accounting policies since the beginning of this fiscal year other than with respect to the liability related to the sale of future royalties and the development derivative liability described above.

Results of Operations

The following data summarizes the results of our operations:

(In thousands, except percentages)	Three Months Ended September 30,				Nine Months Ended September 30,			
	2020	2019	Dollar Change	% of Change	2020	2019	Dollar Change	% of Change
Total revenues	\$ 125,853	\$ 70,061	\$ 55,792	80 %	\$ 329,291	\$ 148,069	\$ 181,222	122 %
Operating costs and expenses	\$ 351,052	\$ 286,360	\$ 64,692	23 %	\$ 963,507	\$ 789,427	\$ 174,080	22 %
Loss from operations	\$ (225,199)	\$ (216,299)	\$ (8,900)	4 %	\$ (634,216)	\$ (641,358)	\$ 7,142	(1)%
Total other (expense) income	\$ (27,253)	\$ 7,370	\$ (34,623)	(470)%	\$ 22,215	\$ 32,688	\$ (10,473)	(32)%
Net loss	\$ (253,291)	\$ (208,535)	\$ (44,756)	21 %	\$ (614,741)	\$ (609,931)	\$ (4,810)	1 %

Discussion of Results of Operations

Revenues

Total revenues consist of the following:

(In thousands, except percentages)	Three Months Ended September 30,				Nine Months Ended September 30,			
	2020	2019	Dollar Change	% of Change	2020	2019	Dollar Change	% of Change
Net product revenues	\$ 99,206	\$ 46,066	\$ 53,140	115 %	\$ 248,677	\$ 110,588	\$ 138,089	125 %
Net revenues from collaborations	26,647	23,995	2,652	11 %	80,614	37,481	43,133	115 %
Total	\$ 125,853	\$ 70,061	\$ 55,792	80 %	\$ 329,291	\$ 148,069	\$ 181,222	122 %

Net product revenues

Net product revenues consist of the following, by product and region:

(In thousands, except percentages)	Three Months Ended September 30,				Nine Months Ended September 30,			
	2020	2019	Dollar Change	% of Change	2020	2019	Dollar Change	% of Change
ONPATTRO								
United States	\$ 39,027	\$ 33,591	\$ 5,436	16 %	\$ 108,491	\$ 80,543	\$ 27,948	35 %
Europe	30,478	10,857	19,621	181 %	74,664	28,311	46,353	164 %
Rest of World (primarily Japan)	13,011	1,618	11,393	704 %	32,560	1,734	30,826	1778 %
Total	\$ 82,516	\$ 46,066	\$ 36,450	79 %	\$ 215,715	\$ 110,588	\$ 105,127	95 %
GIVLAARI								
United States	\$ 12,108	\$ —	\$ 12,108	N/A	\$ 26,043	\$ —	\$ 26,043	N/A
Europe	4,582	—	4,582	N/A	6,919	—	6,919	N/A
Total	\$ 16,690	\$ —	\$ 16,690	N/A	\$ 32,962	\$ —	\$ 32,962	N/A
Total net product revenues	\$ 99,206	\$ 46,066	\$ 53,140	115 %	\$ 248,677	\$ 110,588	\$ 138,089	125 %

Net product revenues increased during the three and nine months ended September 30, 2020, as compared to the same periods in the prior year, as a result of the continued, global expansion of ONPATTRO, in addition to sales generated from our second marketed product, GIVLAARI, following commercial launch in the U.S. in the fourth quarter of 2019 and initial European launch in the second quarter of 2020.

We expect net product revenues to increase for the twelve-month period ending December 31, 2020, as compared to the same period in 2019, as we continue to add new patients onto ONPATTRO and GIVLAARI therapy, as well as launch our approved products into additional markets, assuming regulatory approvals.

Net revenues from collaborations

Net revenues from collaborations consist of the following:

(In thousands, except percentages)	Three Months Ended September 30,				Nine Months Ended September 30,			
	2020	2019	Dollar Change	% of Change	2020	2019	Dollar Change	% of Change
Regeneron	\$ 14,874	\$ 15,261	\$ (387)	(3)%	\$ 49,790	\$ 15,961	\$ 33,829	212 %
Vir	8,512	5,869	2,643	45 %	21,476	7,888	13,588	172 %
MDCO	1,091	528	563	107 %	6,029	2,273	3,756	165 %
Sanofi	420	1,882	(1,462)	(78)%	793	10,382	(9,589)	(92)%
Other	1,750	455	1,295	285 %	2,526	977	1,549	159 %
Total	\$ 26,647	\$ 23,995	\$ 2,652	11 %	\$ 80,614	\$ 37,481	\$ 43,133	115 %

Net revenues from collaborations increased during the three months ended September 30, 2020, as compared to the same period in the prior year, primarily due to an increase in revenue recognized in connection with our collaboration agreement with Vir as a result of increased reimbursable activities associated with the development of RNAi therapeutics targeting SARS-CoV-2.

Net revenues from collaborations increased during the nine months ended September 30, 2020, as compared to the same period in the prior year, primarily due to the increase in revenue recognized in connection with our collaboration agreements with Regeneron and Vir as a result of increased reimbursable activities and the achievement of milestones, respectively, offset by a decrease in reimbursable activities in connection with our collaboration agreements with Sanofi Genzyme.

We expect net revenues from collaborations to increase for the twelve-month period ending December 31, 2020, as compared to the same period in 2019, primarily due to increased reimbursable activities and anticipated achievement of milestones under our collaborations with Regeneron, Vir, and MDCO.

Operating Costs and Expenses

Operating costs and expenses consist of the following:

(In thousands, except percentages)	Three Months Ended September 30,				Nine Months Ended September 30,			
	2020	2019	Dollar Change	% of Change	2020	2019	Dollar Change	% of Change
Cost of goods sold	\$ 21,797	\$ 5,213	\$ 16,584	318 %	\$ 55,028	\$ 12,886	\$ 42,142	327 %
Research and development	161,783	160,796	987	1 %	486,350	453,813	32,537	7 %
Selling, general and administrative	167,472	120,351	47,121	39 %	422,129	322,728	99,401	31 %
Total	\$ 351,052	\$ 286,360	\$ 64,692	23 %	\$ 963,507	\$ 789,427	\$ 174,080	22 %

Cost of goods sold. Cost of goods sold includes the cost of producing and distributing inventories that are related to product revenues, costs related to sales of product supply under our collaboration agreements, third-party royalties and amortization of licensing rights. Based on our inventory policy, we record costs associated with the manufacturing of our products as research and development expense until we determine it is probable that these costs will be recovered through commercial sale (zero-cost inventory).

Cost of goods sold increased during the three and nine months ended September 30, 2020, as compared to the same periods in the prior year, due to the increase in third-party royalties and sales of capitalized inventory. During the three and nine months ended September 30, 2020, product sold and recognized as revenue was substantially from capitalized inventory, whereas during the three and nine months ended September 30, 2019, all units of product sold and recognized as revenue were zero-cost inventory. We will continue to sell our zero-cost inventory of GIVLAARI throughout the remainder of 2020.

We anticipate variability in our cost of goods sold as a percentage of net product revenues due to the timing of manufacturing runs and utilization and the depletion of zero-cost inventories, as well as future product launches. We expect that cost of goods sold will increase for the twelve-month period ending December 31, 2020, as compared to the same period in 2019, primarily as a result of an expected increase in net product sales as well as the sale of capitalized inventory.

Research and development. Research and development expenses consist of the following:

(In thousands, except percentages)	Three Months Ended September 30,				Nine Months Ended September 30,			
	2020	2019	Dollar Change	% of Change	2020	2019	Dollar Change	% of Change
Clinical trial and manufacturing	\$ 54,705	\$ 46,417	\$ 8,288	18 %	\$ 155,757	\$ 133,064	\$ 22,693	17 %
Compensation and related	47,982	41,486	6,496	16 %	145,459	113,173	32,286	29 %
External services	17,512	20,703	(3,191)	(15)%	53,450	51,311	2,139	4 %
Facilities-related	18,256	13,050	5,206	40 %	51,658	38,455	13,203	34 %
Stock-based compensation	13,703	22,737	(9,034)	(40)%	45,542	54,144	(8,602)	(16)%
Lab supplies, materials and other	9,625	8,416	1,209	14 %	32,071	27,848	4,223	15 %
License Fees	—	7,987	(7,987)	(100)%	2,413	35,818	(33,405)	(93)%
Total	<u>\$ 161,783</u>	<u>\$ 160,796</u>	<u>\$ 987</u>	<u>1 %</u>	<u>\$ 486,350</u>	<u>\$ 453,813</u>	<u>\$ 32,537</u>	<u>7 %</u>

For the three months ended September 30, 2020, research and development expenses were relatively flat, as compared to the same period in the prior year, primarily due to the following:

- Increased clinical trial and manufacturing expenses associated with material manufactured for clinical and preclinical activities;
- Increased compensation and related expenses as a result of increased headcount to support long-term strategic growth; and
- Increased facilities-related expenses as a result of costs recognized in connection with placing portions of our cGMP manufacturing facility into service.

Offset by:

- Decreased stock-based compensation primarily due to the achievement of a performance-based milestone related to positive top-line Phase 3 results in the third quarter of 2019; and
- License fees associated with regulatory filings in 2019.

For the nine months ended September 30, 2020, the increase in research and development expenses, as compared to the same period in the prior year, was primarily related to the following:

- Increased compensation and related expenses as a result of increased headcount to support long-term strategic growth;
- Increased clinical trials and manufacturing and lab supplies, materials and other expenses as a result of increased preclinical and clinical services related to the advancement of our early- and late-stage programs to support our long-term strategic goals; and
- Increased facilities-related expenses as a result of costs recognized in connection with placing portions of our cGMP manufacturing facility into service.

Partially offset by:

- Decreased license fees associated with the execution of our collaboration agreement with Regeneron and regulatory milestones occurring in 2019 with no corresponding activity in 2020.

During the three and nine months ended September 30, 2020 and 2019, in connection with advancing activities under our collaboration agreements, we incurred research and development expenses, primarily related to external development and manufacturing services. The following table summarizes research and development expenses incurred, for which we recognize net revenue, that are directly attributable to our collaboration agreements, by collaboration partner:

(In thousands)	Three Months Ended September 30,		Nine Months Ended September 30,	
	2020	2019	2020	2019
Regeneron	\$ 12,565	\$ 11,114	\$ 44,108	\$ 12,105
Vir	4,903	7,256	11,782	8,386
MDCO	67	6,737	1,609	8,484
Sanofi	1,009	4,960	1,633	13,040
Total	<u>\$ 18,544</u>	<u>\$ 30,067</u>	<u>\$ 59,132</u>	<u>\$ 42,015</u>

Selling, general and administrative. Selling, general and administrative expenses consist of the following:

(In thousands, except percentages)	Three Months Ended September 30,				Nine Months Ended September 30,			
	2020	2019	Dollar Change	% of Change	2020	2019	Dollar Change	% of Change
Compensation and related	\$ 53,532	\$ 36,991	\$ 16,541	45 %	\$ 148,502	\$ 107,706	\$ 40,796	38 %
Consulting and professional services	40,008	39,670	338	1 %	120,318	100,307	20,011	20 %
Stock-based compensation	23,561	23,272	289	1 %	60,055	54,500	5,555	10 %
Facilities-related	11,299	9,123	2,176	24 %	32,695	26,188	6,507	25 %
Other	39,072	11,295	27,777	246 %	60,559	34,027	26,532	78 %
Total	\$ 167,472	\$ 120,351	\$ 47,121	39 %	\$ 422,129	\$ 322,728	\$ 99,401	31 %

For the three and nine months ended September 30, 2020, the increase in selling, general and administrative expenses, as compared to the same periods in the prior year, was primarily related to the following:

- Increased compensation and related and consulting and professional services expenses as a result of increased headcount to support long-term strategic growth and potential additional product launches in 2020 and thereafter, as well as the continued commercialization of ONPATTRO and GIVLAARI; and
- Increased other expenses primarily due to a change in an estimated accrual for our contingent liability related to our arbitration with Ionis Pharmaceuticals, Inc., or Ionis.

We expect that research and development expenses combined with selling, general and administrative expenses will increase for the twelve-month period ending December 31, 2020, as compared to the same period in 2019, as we continue to develop our pipeline, advance our product candidates, including partnered programs, into later-stage development, prepare regulatory submissions and build-out of our global commercial infrastructure and field team to support ONPATTRO, GIVLAARI and potentially additional product launches. However, we 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 our determination regarding the probability of vesting for performance-based awards.

Total Other (Expense) Income. Total other (expense) income consists of the following:

(In thousands, except percentages)	Three Months Ended September 30,				Nine Months Ended September 30,			
	2020	2019	Dollar Change	% of Change	2020	2019	Dollar Change	% of Change
Interest expense	\$ (28,731)	\$ —	\$ (28,731)	N/A	\$ (55,979)	\$ —	\$ (55,979)	N/A
Interest income	2,072	9,889	(7,817)	(79)%	10,717	26,195	(15,478)	(59)%
Other (expense) income	(594)	(2,519)	1,925	(76)%	67,477	(2,929)	70,406	(2,404)%
Change in fair value of liability obligation	—	—	—	N/A	—	9,422	(9,422)	(100)%
Total	\$ (27,253)	\$ 7,370	\$ (34,623)	(470)%	\$ 22,215	\$ 32,688	\$ (10,473)	(32)%

For the three months ended September 30, 2020, total other expense increased, as compared to the same period in the prior year, primarily due to \$28.7 million of interest expense associated with the sale of future royalties and a \$7.8 million decrease in interest income as a result of Federal interest rate cuts.

For the nine months ended September 30, 2020, total other income decreased, as compared to the same period in the prior year, due to \$56.0 million of interest expense associated with the sale of future royalties, a \$15.5 million decrease of interest income as a result of Federal interest rate cuts and a \$9.4 million gain in 2019 as a result of the final mark-to-market adjustment of a liability obligation, for which there was no corresponding gain in 2020, offset by an increase in other income due to realized and unrealized gains in marketable equity securities of \$66.6 million.

Liquidity and Capital Resources

The following table summarizes our cash flow activities:

(In thousands)	Nine Months Ended September 30,	
	2020	2019
Net loss	\$ (614,741)	\$ (609,931)
Non-cash adjustments to reconcile net loss to net cash used in operating activities:	150,133	136,767
Changes in operating assets and liabilities	(27,209)	390,717
Net cash used in operating activities	(491,817)	(82,447)
Net cash used in investing activities	(337,630)	(196,827)
Net cash provided by financing activities	777,029	782,842
Effect of exchange rate changes on cash, cash equivalents and restricted cash	1,946	(449)
Net (decrease) increase in cash, cash equivalents and restricted cash	(50,472)	503,119
Cash, cash equivalents and restricted cash, beginning of period	549,628	422,631
Cash, cash equivalents and restricted cash, end of period	\$ 499,156	\$ 925,750

Since we commenced operations in 2002, we have generated significant losses. As of September 30, 2020, we had an accumulated deficit of \$4.34 billion. As of September 30, 2020, we had cash, cash equivalents and marketable securities of \$1.83 billion, compared to \$1.54 billion as of December 31, 2019.

Operating activities

Net cash used in operating activities increased during the nine months ended September 30, 2020, compared to the same period in 2019, primarily due to the receipt of \$400.0 million in May 2019 for the upfront payment associated with our strategic collaboration with Regeneron.

Investing activities

Net cash used in investing activities increased during the nine months ended September 30, 2020, compared to the same period in the prior year, primarily due to an increase in the purchase of marketable debt securities and a decrease in the proceeds from the sales and maturities of marketable securities.

Financing activities

Net cash provided by financing activities decreased during the nine months ended September 30, 2020, compared to the same period in the prior year, primarily due to proceeds of \$400.0 million from our issuance of common stock to Regeneron in April 2019 and \$381.9 million received from our January 2019 underwritten public offering, offset by \$500.0 million received from our sale of the MDCO royalty interest in April 2020 and an increase in the proceeds from the issuance of common stock in connection with stock option exercises and other types of equity during the nine months ended September 30, 2020.

Operating Capital Requirements

We currently have programs focused on a number of therapeutic areas and, as of September 30, 2020, have two globally marketed products, ONPATRO and GIVLAARI. However, our ongoing development efforts may not be successful and we may not be able to commence sales of any other products in the future. In addition, 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 global operations, continued management and growth of our intellectual property including our patent portfolio, collaborations and general corporate activities.

Based on our current operating plan, we believe that our cash, cash equivalents and marketable securities as of September 30, 2020, together with the cash we expect to generate from product sales, and under our current alliances, as well as the funds due or available to us as a result of the strategic financing collaboration with Blackstone, will be sufficient to enable us to advance our long-term strategic goals for multiple years from the filing of this Quarterly Report on Form 10-Q.

Although we believe the strategic financing collaboration with Blackstone will enable us to achieve a self-sustainable financial profile without the need for further equity financing, in the future, we may seek additional funding through new collaborative arrangements, public or private debt financings, royalty or other monetization transactions or a combination of one or more of these funding sources. Additional funding may not be available to us on acceptable terms or at all. Moreover, the terms of any additional financing may adversely affect the holdings or the rights of our stockholders.

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, 2019. In April 2020, we entered into a purchase and sale agreement with Blackstone, resulting in an initial recognition of \$1.00 billion liability related to the sale of future royalties. In August 2020, we entered into the Funding Agreement with Blackstone, resulting in the recognition of a \$5.4 million development derivative liability. Please read Note 5 and Note 10, respectively, to our condensed consolidated financial statements included in Part I, Item 1, “Financial Statements (Unaudited)” of this Quarterly Report on Form 10-Q for a description of these agreements. As a result, we expect our contractual obligations through 2036 will increase from the amounts previously disclosed in our 2019 Annual Report on Form 10-K due to payments under these agreements.

Recent Accounting Pronouncements

Please read Note 2 to our condensed consolidated financial statements included in Part I, 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.

Financial market risks related to interest rates are described in our Annual Report on Form 10-K for the year ended December 31, 2019. As of September 30, 2020, there have been no significant changes to the financial market risks described as of December 31, 2019. We do not currently anticipate any other near-term changes in the nature of our financial market risk exposures or in management’s objectives and strategies with respect to managing such exposures.

ITEM 4. CONTROLS AND PROCEDURES.

Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer (principal executive officer) and executive vice president, Chief Financial Officer (principal financial officer), evaluated the effectiveness of our disclosure controls and procedures as of September 30, 2020. The term “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under 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 September 30, 2020, our Chief Executive Officer and executive vice president, Chief Financial Officer concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

Changes in Internal Control

There were no changes in our internal control over financial reporting during the quarter ended September 30, 2020 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

For a discussion of material pending legal proceedings, please read Note 14, Commitments and Contingencies – Legal Matters, 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

Risks Related to Our Business

Risks Related to Our Financial Results

The current pandemic of the novel coronavirus, or COVID-19, and the future outbreak of other highly infectious or contagious diseases, could have a material adverse impact on our business, financial condition and results of operations, including our commercial operations and sales, clinical trials and preclinical studies.

In December 2019, a novel strain of coronavirus, or COVID-19, was reported to have surfaced and it has now reached multiple regions, countries and cities, including Cambridge, Massachusetts where our primary office and laboratory space is located, and all countries in which we have offices. The COVID-19 pandemic continues to evolve and many geographies are seeing a resurgence of infections. To date, the pandemic has led to the implementation of various responses, including government-imposed quarantines, travel restrictions and other public health safety measures. Certain jurisdictions have begun re-opening only to return to restrictions in the face of increases in new COVID-19 cases. COVID-19 has and will likely continue to impact our operations and those of our third-party partners and the ultimate impact on our business and financial results remains uncertain and cannot be predicted with confidence, and will depend on many factors, including the scope, severity and duration of the pandemic, the actions taken to contain the pandemic or mitigate its impact, and the direct and indirect economic effects of the pandemic and containment measures, among others. The rapid development and continued fluidity of this situation precludes any prediction as to the full adverse impact of the COVID-19 pandemic. Nevertheless, the COVID-19 pandemic may adversely affect our business, financial condition and results of operations.

In response to the spread of COVID-19, we have taken temporary precautionary measures intended to help minimize the risk of the virus to our employees and their families, including implementing a global work from home policy for nearly all employees who are able to perform their duties remotely, and have generally restricted on-site staff to only those personnel and contractors who perform activities that need to be completed on-site, limited the number of staff in any given laboratory, manufacturing facility or other facility and implemented safety practices and procedures for those individuals who are required to work in our facilities, including but not limited to mandatory health screening, the use of face coverings, physical distancing requirements and increased cleaning protocols. We also suspended non-essential business travel for our employees and may take further measures as the pandemic continues. In addition, our customer-facing employees in most markets moved and could again need to move to virtual interactions with healthcare providers, administrators, patients, payers, regulators and other government employees. In September 2020, we initiated a voluntary program that allowed certain employees to return to physical locations in some geographies, including in the U.S. and certain countries in Europe, in accordance with local government laws, regulations and restrictions and our own safety procedures and practices. Our office sites are equipped and operational with effective hygiene, physical distancing, temperature screening, contact tracing and cleaning measures in place, and we expect to adopt and implement additional precautions commensurate with any expansion of employees returning to physical locations. At this time, we cannot predict when certain restrictions that are in place to protect our employees can be further reduced or will no longer be needed. The effects of government-imposed quarantines and our work-from-home policies may negatively impact productivity, or disrupt, delay, or otherwise adversely impact our business. Compliance with governmental measures imposed in response to COVID-19 has caused and will continue to cause us to incur additional costs, and any inability to comply with such measures can subject us to restrictions on our business activities, fines, and other penalties, any of which can adversely affect our business. In addition, the increase in certain of our employees working remotely has amplified certain risks to our business, including increased demand on our information technology resources and systems, increased phishing and other cybersecurity attacks, and any failure to effectively manage these risks, including to timely identify and appropriately respond to any cyberattacks, could adversely impact our business operations.

As a result of the COVID-19 pandemic, we may experience disruptions that could severely impact our business and operations, including our ability to successfully commercialize our approved products, ONPATTRO and GIVLAARI, and due to the current pandemic, we may not be able to meet expectations with respect to commercial sales. For example, due to the impact of the COVID-19 pandemic, product revenues for ONPATTRO could be less than originally forecast for 2020. In addition, we may also experience decreased patient demand for our approved products if current or potential patients decide to delay treatment as a result of the COVID-19 pandemic. For example, in the second quarter of 2020, we experienced a decrease in patient demand in the U.S. due to reduced adherence as some patients skipped doses or experienced dose delays while moving to new sites of care, and additionally experienced reduced requests for genetic testing through our third party genetic testing program resulting in delays in diagnoses of the rare diseases our medicines are approved to treat, which could have an

adverse effect on revenues in future periods. In addition, business interruptions from the current or future pandemics, including staffing shortages, production slowdowns and disruptions in delivery systems, may also adversely impact the third parties we or our partners rely on in the U.S. and abroad to sufficiently manufacture our approved products and to produce product candidates in quantities we require, which may impair our commercialization efforts, our research and development activities and the potential commercialization of our product candidates.

Additionally, timely completion of preclinical activities and initiation of planned clinical trials is dependent upon the availability of, for example, preclinical and clinical trial sites, researchers and investigators, patients or healthy volunteer subjects available for recruitment and enrollment, and regulatory agency personnel, which may be adversely affected by global health matters, such as the COVID-19 pandemic. We are conducting and plan to continue to conduct preclinical activities and clinical trials for our drug product candidates in geographies which have been and continue to be affected by COVID-19, and believe that the COVID-19 pandemic will have an impact on various aspects of our ongoing clinical trials and on the clinical trials and preclinical studies we expected to initiate in 2020. For example, certain trial sites in some of our ongoing clinical trials have been restricted temporarily by the institutions where they are located from scheduling patient visits or permitting onsite monitoring and in some of our ongoing trials, delayed or missed doses of study drug have been reported. In addition, in May 2020, we announced that due to the impact of the COVID-19 pandemic, enrollment delays in our APOLLO-B Phase 3 study of patisiran for the treatment of ATTR amyloidosis with cardiomyopathy will result in a shift in the enrollment completion date from late 2020 into 2021.

Health regulatory agencies globally may also experience disruptions in their operations as a result of the COVID-19 pandemic. While the FDA has resumed domestic facility inspections following the March 2020 suspension of most foreign and domestic facility inspections, the FDA and comparable foreign regulatory agencies may have slower response times or be under-resourced, which could significantly delay the FDA or EMA's ability to timely review and process any submissions we or our partners have filed or may file. For example, any delay by the FDA or EMA could impact the regulatory review of our NDA and MAA submissions for lumasiran or the NDA and MAA submissions for inclisiran, which is being advanced by our partner, MDCO, which could materially and adversely affect our business.

Some factors from the COVID-19 pandemic that may delay or otherwise adversely affect enrollment in and the conduct of the clinical trials of our product candidates, as well as adversely impact our business generally, include:

- the ongoing diversion of healthcare resources away from the conduct of clinical trials to focus on pandemic concerns, including the availability of necessary materials and the attention of physicians serving as our clinical trial investigators, hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our clinical trials;
- limitations on travel that could interrupt key trial activities, such as clinical trial site initiations and monitoring, domestic and international travel by employees, contractors or patients to clinical trial sites, including any government-imposed travel restrictions or quarantines that will impact the ability or willingness of patients, employees or contractors to travel to our research, manufacturing and clinical trial sites or secure visas or entry permissions, any of which could delay or adversely impact the conduct or progress of our clinical trials;
- interruption or delays in the operations of the FDA and comparable foreign regulatory agencies, which may impact review, inspection and approval timelines;
- interruption of, or delays in receiving, supplies of our product candidates from our contract manufacturing organizations due to staffing shortages, production slowdowns or stoppages and disruptions in delivery systems; and
- business disruptions caused by potential workplace, laboratory and office closures and an increased reliance on employees working from home, disruptions to or delays in ongoing laboratory experiments and operations, staffing shortages, travel limitations, cyber security and data accessibility, or communication or mass transit disruptions, any of which could adversely impact our business operations or delay necessary interactions with local regulators, ethics committees, manufacturing sites, research or clinical trial sites and other important agencies and contractors.

These and other factors arising from the COVID-19 pandemic could worsen in countries that are already afflicted with COVID-19, could continue to spread to additional countries, or could return to countries where the pandemic has been partially contained, each of which could further adversely impact our ability to conduct clinical trials and our business generally, and could have a material adverse impact on our operations and financial condition and results. In addition, the trading prices for our common stock and the common stock of other biopharmaceutical companies have been highly volatile as a result of the COVID-19 pandemic. A recession, depression or other sustained adverse market event resulting from the COVID-19 pandemic could materially and adversely affect our business and the value of our common stock.

The global pandemic of COVID-19 continues to rapidly evolve. The ultimate impact of the COVID-19 pandemic is highly uncertain and subject to change. We do not yet know the full extent of potential delays or impacts on our business, our commercial results, clinical trials, healthcare systems or the global economy as a whole. These effects could have a material impact on our operations, and we will continue to monitor the COVID-19 situation closely.

We have limited experience as a commercial company and the marketing and sale of ONPATTRO, GIVLAARI or any future products may be unsuccessful or less successful than anticipated.

In 2018, our first commercial product, ONPATTRO, was approved by the FDA and EMA, and we have since received approval in several additional territories. To date, we have launched ONPATTRO in the U.S., Japan, Canada, Brazil and in several countries in Europe. In addition, in November 2019, the FDA approved our second product, GIVLAARI, which was also approved by the EMA in March 2020, Brazil in July 2020 and Canada in October 2020. While we have commercially launched ONPATTRO and GIVLAARI, we have limited experience as a commercial company and there is limited information about our ability to successfully overcome many of the risks and uncertainties encountered by companies commercializing products in the biopharmaceutical industry. We also have several product candidates in late-stage clinical development, including lumasiran, which is under review by the FDA and EMA for marketing approval. To execute our business plan of building a multi-product, commercial-stage biopharmaceutical company and achieving a self-sustainable financial profile in the future, in addition to successfully marketing and selling ONPATTRO and GIVLAARI, we will need to successfully:

- execute product development activities using new 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 ONPATTRO and GIVLAARI, as well as any other products we commercialize, including in each case, lumasiran;
- attract and retain customers for our products;
- 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, successfully commercialize ONPATTRO, GIVLAARI or any future products, including lumasiran, raise capital, if needed, repay the debt we plan to incur in 2020 and 2021, expand our business, achieve financial self-sustainability or continue our operations.

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

We have experienced significant operating losses since our inception. As of September 30, 2020, we had an accumulated deficit of \$4.34 billion. Although to date we have launched ONPATTRO in the U.S. and several other countries globally, launched GIVLAARI in the U.S. and several countries in Europe, and expect to launch our commercially approved products in additional countries during 2020 and beyond, we may never attain profitability or positive cash flow from operations. For the quarter ended September 30, 2020, we recognized \$99.2 million in net product revenues from sales of ONPATTRO and GIVLAARI. While we believe 2019 was our peak net loss year, we expect to continue to incur annual net operating losses for the foreseeable future and will require substantial resources over the next several years as we expand our efforts to discover, develop and commercialize RNAi therapeutics, and aim to achieve a self-sustainable financial profile. While we believe the funding provided by our strategic financing collaboration with Blackstone should enable us to achieve a self-sustainable profile without the need for future equity financing, we will depend on our ability to generate revenues to achieve this goal. In addition to revenues derived from sales of our current and future, if any, commercially approved products, we anticipate that a portion of any revenues we generate over the next several years will continue to be from alliances with pharmaceutical and biotechnology companies. We 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 under our existing or new alliances.

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 become and/or continue 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 as a commercial company, 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 funds to continue our research, development and commercialization activities and if the funds we require are greater than what we have estimated, we may need to critically limit or 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 ONPATTRO, GIVLAARI and any other products that are approved for commercial sale, including lumasiran. Because the length of time or activities associated with successful development of our product candidates, including vutrisiran,

may be greater than we anticipate, we are unable to estimate the actual funds we will require to develop and commercialize them.

We believe 2019 was our peak net loss year, and believe that our strategic financing collaboration with Blackstone will enable us to achieve a self-sustainable financial profile without need for future equity financing. However, 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 continued 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, including milestone payments related to inclisiran, which is being advanced by our partner, MDCO (acquired by Novartis AG in January 2020);
- 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 studies, obtain regulatory approvals, prepare for global 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 impact of COVID-19 on the initiation or completion of preclinical studies or clinical trials and the supply of our products or product candidates;
- 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;
- the timing, receipt and amount of sales and royalties, if any, from ONPATTRO and GIVLAARI and our potential products, including lumasiran; and
- the outcome of the regulatory review process and commercial success of drug products for which we are entitled to receive royalties, including inclisiran.

If our estimates, predictions and financial guidance relating to these factors are incorrect, we may need to modify our operating plan and may be required to seek additional funding in the future. We may do so through either collaborative arrangements, public or private equity offerings or debt financings, royalty or other monetization transactions 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 2020, we entered into a credit agreement, or Credit Agreement, for up to \$750.0 million among us, certain of our subsidiaries (together with us, the Loan Parties), funds or accounts managed or advised by GSO Capital Partners LP and certain other affiliates of Blackstone, and the other lenders from time to time party thereto, collectively, the Lenders, and Wilmington Trust, National Association, as the administrative agent for the lenders. The Credit Agreement provides for a senior secured delayed draw term loan facility to be funded in three tranches, or Term Loans, each tranche to be requested by certain dates specified in the Credit Agreement, and subject to customary terms and conditions in the case of each tranche. In the event certain borrowing conditions are not satisfied as of December 31, 2022, the Lenders are not required to fund the second and third tranches of the term loan facility. If we are unable to secure the borrowings under the second and third tranches of the term loan facility, we may not be able to replace the financing commitment on favorable terms, or at all. The Term Loans mature seven years from the date of the first draw, and bear interest at a variable rate. All obligations under the Credit Agreement will be secured, subject to certain exceptions, by security interests in certain assets, including the intellectual property owned by us relating to ONPATTRO, GIVLAARI and vutrisiran, the equity interests held by the Loan Parties in their subsidiaries, all of our ownership of the inclisiran royalty remaining after the royalty purchase and material real property, and certain personal property, including, without limitation, cash held in certain deposit accounts of the Loan Parties and equipment. The Credit Agreement contains negative covenants that, among other things and subject to certain exceptions, could restrict our ability to, incur additional liens, incur additional indebtedness, make investments, including acquisitions, engage in fundamental changes, sell or dispose of assets that constitute collateral, including certain intellectual property, pay dividends or make any distribution or payment on or redeem, retire or purchase any equity interests, amend, modify or waive certain material agreements or organizational documents and make payments of certain subordinated indebtedness. The Credit Agreement also requires us to

have consolidated liquidity of at least \$100.0 million as of the last day of each fiscal quarter. Additionally, the Credit Agreement contains certain customary representations and warranties, affirmative covenants and provisions relating to events of default, including nonpayment of principal, interest and other amounts; failure to comply with covenants; the rendering of judgments or orders of default by us in respect of other material indebtedness; and certain insolvency and ERISA events. In August 2020, in connection with execution of the Funding Agreement, we entered into the First Amendment to the Credit Agreement. The First Amendment added certain intellectual property owned by us relating to ALN-AGT as collateral under the Credit Agreement, as amended, and made certain other amendments related thereto and the Funding Agreement. Our ability to satisfy our obligations under the Credit Agreement, as amended, 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.

The terms of any financing we may be required to pursue in the future notwithstanding the funds due or available to us from Blackstone may adversely affect the holdings or the rights of our stockholders. 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. For example, pursuant to our stock purchase agreement with Blackstone, we agreed to register the resale of the shares purchased on a registration statement within 60 days of April 10, 2020, and on June 5, 2020, such registration statement was filed with the Securities and Exchange Commission. In addition, subject to certain conditions, Blackstone will be entitled to participate in registered underwritten public offerings by us if other selling stockholders are included in the registration.

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 delay or curtail the continued build out of our global commercial infrastructure, and our ability to achieve our long-term strategic goals 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.

We expect our operating results to fluctuate in future periods, which may adversely affect our stock price.

Our quarterly operating results have fluctuated in the past, and we believe they will continue to do so in the future. Our operating results may fluctuate due to the level of success of our commercial efforts and resulting revenues, as well as the variable nature of our operating expenses as a result of the timing and magnitude of expenditures. In one or more future periods, our results of operations may fall below the expectations of securities analysts and investors. In that event, the market price of our common stock could substantially decline.

If the estimates we make, or the assumptions on which we rely, in preparing our condensed consolidated financial statements and/or our projected guidance 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, or GAAP. 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.

Further, from time to time we issue financial guidance relating to our expectations regarding our non-GAAP research and development and selling, general and administrative expenses, and expectations for our cash, cash equivalents and marketable securities available for operations, which guidance is based on estimates and the judgment of management. If, for any reason, our expenses differ materially from our guidance or we utilize our cash more quickly than anticipated, we may have to adjust our publicly announced financial guidance. If we fail to meet, or if we are required to change or update any element of, our publicly disclosed financial guidance or other expectations about our business, our stock price could decline.

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

As of September 30, 2020, we had \$1.83 billion in cash, cash equivalents and marketable securities. 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.

Changes in tax law could adversely affect our business and financial condition.

Our business is subject to numerous international, federal, state, and other governmental laws, rules, and regulations that may adversely affect our operating results, including, taxation and tax policy changes, tax rate changes, new tax laws, or revised tax law interpretations, which individually or in combination may cause our effective tax rate to increase. In the U.S., the rules dealing with federal, state, and local income taxation are constantly under review by persons involved in the legislative process and by the Internal Revenue Service and the U.S. Treasury Department. Changes to tax laws (which changes may have retroactive application) could adversely affect us or holders of our common stock. In recent years, many such changes have been made and changes are likely to continue to occur in the future. For example, on March 27, 2020, President Trump signed into law the Coronavirus Aid, Relief, and Economic Security Act, or CARES Act, which included certain changes in tax law intended to stimulate the U.S. economy in light of the COVID-19 pandemic, including temporary changes to the treatment of net operating losses, interest deductibility limitations and payroll tax matters. Future changes in tax laws could have a material adverse effect on our business, cash flow, financial condition or results of operations.

Additionally, the Organization for Economic Co-operation and Development, or OECD, the EC, and individual taxing jurisdictions where we and our affiliates do business have recently focused on issues related to the taxation of multinational corporations. The OECD has released its comprehensive plan to create an agreed set of international rules for fighting base erosion and profit shifting. In addition, the OECD, the EC and individual countries are examining changes to how taxing rights should be allocated among countries considering the digital economy. As a result, the tax laws in the U.S. and other countries in which we and our affiliates do business could change on a prospective or retroactive basis and any such changes could materially adversely affect our business.

Risks Related to Our Dependence on Third Parties

We may not be able to execute our business strategy if we are unable to maintain existing or enter into new 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 are continuing to advance our commercial capabilities, including in marketing, sales, market access and distribution, to support our wholly-owned products. We also continue to advance our growing pipeline of RNAi therapeutic opportunities. However, we may not have adequate capacity or capabilities to advance all of our therapeutic opportunities. Accordingly, we have entered into alliances with other companies and collaborators that we believe can provide such capabilities in certain territories and/or for certain product candidates, 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, as a result of our broad strategic alliance with Sanofi Genzyme formed in 2014, Sanofi Genzyme is now developing and commercializing fitusiran globally. In addition, we formed a collaboration with MDCO (which was acquired by Novartis AG in January 2020) to advance inclisiran. In March 2018, we entered into a discovery collaboration with Regeneron to identify RNAi therapeutics for NASH and potentially other related diseases, and in November 2018, we and Regeneron entered into a separate, fifty-fifty collaboration to further research, co-develop and commercialize any therapeutic product candidates that emerge from these discovery efforts. In October 2017, we announced an exclusive licensing agreement with Vir for the development and commercialization of RNAi therapeutics for infectious diseases, including chronic HBV infection, and in early 2020, we expanded our exclusive licensing agreement to include the development and commercialization of RNAi therapeutics targeting SARS-CoV-2, the virus that causes the disease COVID-19, as well as up to three human host factor targets relating to susceptibility to coronaviruses, for use in connection with the treatment, palliation, diagnosis or prevention of SARS-CoV-2 and other diseases caused by coronaviruses. In April 2020, we entered into a development and commercialization collaboration with Dicerna to advance investigational RNAi therapeutics for the treatment of alpha-1 liver disease. With respect to our CNS/Ocular Disease pipeline, in April 2019, we announced a global, strategic collaboration with Regeneron to discover, develop and commercialize RNAi therapeutics for a broad range of diseases by addressing therapeutic targets expressed in the eye and CNS, in addition to a select number of targets expressed in the liver.

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) Regeneron for the development and commercialization of all programs targeting eye diseases (subject to limited exceptions), and potentially other CNS and liver programs, (ii) MDCO for all future development and commercialization of inclisiran worldwide, and (iii) Sanofi Genzyme for the development and commercialization of fitusiran worldwide. In the case of each such collaboration referenced in clauses (i)-(iii) above, we are entitled to royalties on the sales of each of these products. If our collaborators are not successful in their development and/or commercialization efforts, our future revenues from RNAi therapeutics for these indications may be adversely affected. Moreover, if the revenues generated by the royalties received from us by Blackstone with respect to

inclisiran sales do not reach a certain level by the end of 2029, Blackstone will be entitled to a higher royalty percentage beginning in 2030, which would have an adverse impact on our revenues beginning in 2030.

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 POC for our technology in humans, including our alternative conjugate approach for delivering CNS or ocular product candidates, 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 give rise to concerns around the safety and/or efficacy of our technology platform or product candidates. In addition, the occurrence of a fatal thrombotic SAE in our fitusiran study in 2017 could contribute to further concerns about the safety of our therapeutic candidates. Even when we succeed in securing 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, we have formed collaborations to fund all or part of the costs of drug development and commercialization, such as our collaborations with Regeneron, MDCO, Vir, Dicerna and Sanofi Genzyme. 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 these product candidates 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 materially amends, 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 materially amends or 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. For example, our agreement with MDCO, which was acquired by Novartis AG in January 2020, relating to the development and commercialization of inclisiran worldwide may be terminated by MDCO at any time upon four months' prior written notice, provided if the agreement is terminated by MDCO for convenience, MDCO has agreed to grant a license to us under certain of our technology developed in the course of MDCO's activities under the agreement, subject to a royalty to be negotiated between the parties. Moreover, any adverse actions by MDCO or Novartis with respect to the MDCO agreement could adversely impact our ability to comply with our obligations under our agreements with Blackstone. 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 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.

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, as in the case of MDCO and Novartis AG, 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 financial resources or capabilities to continue such development and commercialization on our own.

Although we sold a portion of the expected royalty stream and commercial milestones from the global sales of inclisiran by our collaborator, MDCO (acquired by Novartis AG in January 2020), we are entitled to retain the remaining portion of future royalties from the global sales of inclisiran and, if certain specified thresholds are met, to the remaining portion of commercial milestone payments, and any negative developments related to inclisiran could have a material adverse effect on our receipt of those payments.

In April 2020, we sold to Blackstone 50% of the royalties payable to us with respect to net sales by MDCO, its affiliates or sublicensees of inclisiran and 75% of the commercial milestone payments payable to us under the MDCO license and collaboration agreement. If Blackstone does not receive royalty payments in respect of global sales of inclisiran equaling at least \$1.00 billion by December 31, 2029, Blackstone's royalty interest will increase to 55% effective January 1, 2030. Our receipt of future royalty payments and a portion of commercial milestone payments may be negatively impacted if the inclisiran royalty stream and commercial milestones payments are insufficient to meet the specified thresholds. Additional factors that may have an adverse effect on the potential inclisiran royalty stream and commercial milestones include:

- companies working to develop new therapies or alternative formulations of products for ASCVD;
- foreign currency movement, which could have a negative impact on MDCO's future sales of inclisiran, assuming approval, thereby reducing the royalties;
- any negative developments relating to inclisiran, such as safety, efficacy, or reimbursement issues, could reduce demand for inclisiran;
- any disputes concerning patents, proprietary rights, or license and collaboration agreements could negatively impact our receipt of commercial milestone payments or royalties; and
- adverse regulatory or legislative developments could limit or prohibit the sale of inclisiran, if approved, such as restrictions on the use of inclisiran or safety-related label changes, including enhanced risk management programs, which may significantly reduce expected royalty revenue and commercial milestone payments and could require significant expense to address the associated legal and regulatory issues.

If the revenues generated by sales of inclisiran are lower than expected, our business could be materially adversely affected.

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 continue to commercialize ONPATTRO and GIVLAARI, continue to develop our current product candidates, including vutrisiran, apply for regulatory approvals and, if approved, commercialize future products, including lumasiran, 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 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 are completing construction and qualification of a cGMP manufacturing facility for drug substance for clinical and, eventually, 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 finished product we will require for any clinical trials that we initiate and to support the commercial supply of ONPATTRO, GIVLAARI and any of our other product candidates, including lumasiran. There are a limited number of manufacturers that supply synthetic siRNAs. We currently rely on a limited number of CMOs for our supply of synthetic siRNAs. For example, in July 2015, we amended our manufacturing services 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 product candidates in clinical development, as well as other products the parties may agree upon in the future. We currently rely on Agilent to supply the active pharmaceutical ingredient to support the commercial supply of ONPATTRO and GIVLAARI, and we have entered into manufacturing services agreements with Agilent for such supply of ONPATTRO and GIVLAARI. 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 and potentially put at risk commercial supply, 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 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 to deliver the siRNA to the relevant cell or tissue type, such as LNPs 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 one 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 manufacturing, 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 result in unusable product, supply delays and shortages. 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. On March 27, 2020, President Trump signed into law the CARES Act in response to the COVID-19 pandemic. Throughout the COVID-19 pandemic, there has been public concern over the availability and accessibility of critical medical products, and the CARES Act enhances FDA's existing authority with respect to drug shortage measures. Under the CARES Act, manufacturers must have in place a risk management plan that identifies and evaluates the risks to the supply of approved drugs for certain serious diseases or conditions for each establishment where the drug or active pharmaceutical ingredient is manufactured. The risk management plan will be subject to FDA review during an inspection. If we experience shortages in the supply of our marketed products, our results could be materially impacted.

Given the limited number of suppliers for our delivery technology and drug substance, we 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 ONPATTRO and believe we have adequate resources to supply our drug product commercial needs. In addition, as noted above, we are developing our own capabilities to manufacture drug substance 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 a lengthy process 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. Given our dependence on a limited number of CMOs to supply drug substance for our commercial products and clinical candidates, and our dependence on our own facility to produce patisiran formulated bulk drug product, any delay in supply caused by the COVID-19 pandemic, in particular at Agilent or at other facilities, could impact our ability to procure sufficient supplies for ONPATTRO and GIVLAARI, and the development of our product candidates, including lumasiran, could also be delayed. Any delay or setback in the manufacture of ONPATTRO or GIVLAARI could impede ongoing commercial supply, which could significantly impact our revenues and operating results. In addition, to the extent we or our partners rely on CMOs outside of the U.S. to supply drug substance for our product candidates, any delays or disruptions in supply caused by the COVID-19 pandemic could have a material adverse impact on the research and development activities and potential commercialization of our or our partners' product candidates.

The manufacturing process for ONPATTRO, GIVLAARI and any other products that we may develop, including lumasiran, 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 our product candidates and/or our marketed products, 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 may 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 process 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 candidates or commercialize our products 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 such CMO in order to have another CMO manufacture our products or product candidates.

We have limited commercial experience and newly established capabilities for marketing, sales, market access and distribution, and expect to continue to invest significant financial and management resources to continue to build these capabilities and to establish a global commercial infrastructure. Even if we build and scale our commercial capabilities, the market may not be receptive to our commercial products.

We have limited commercial experience and newly established capabilities for marketing, sales, market access and distribution. 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 ONPATTRO and GIVLAARI, as well as several of our late-stage product candidates if approved, including lumasiran and vutrisiran, on our own globally. Accordingly, we have developed internal marketing, sales, market access and distribution capabilities as part of our core product strategy initially in the U.S. and the EU, with expansion ongoing globally, which has, and will continue to, require significant financial and management resources. For those products for which we will perform marketing, sales, market access and distribution functions ourselves, including ONPATTRO, GIVLAARI and, if approved, lumasiran and vutrisiran, and for future products we successfully develop where we may retain certain product development and commercialization rights, we could face a number of additional risks, including:

- developing and retaining our global sales, marketing and administrative infrastructure and capabilities;
- hiring, training, managing and supervising our personnel worldwide;
- the cost of establishing, or leveraging an established, marketing or sales force, which may not be justifiable in light of the revenues generated by any particular product and/or in any specific geographic region; and
- our direct sales and marketing efforts may not be successful.

If we are unable to continue to develop and scale our own global marketing, sales, market access and distribution capabilities for ONPATTRO, GIVLAARI and any future products, including lumasiran, if approved, we will not be able to successfully commercialize our products without reliance on third parties.

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, or CROs, 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, auditing and data management services. These investigators and CROs are not our employees and we have limited control over the amount of time and resources they dedicate to our programs. These third parties may have contractual relationships with other entities, some of which may be our competitors, which may draw their time and resources away from our programs. 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 CROs are required to comply with applicable 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, and to implement timely corrective action to any non-compliance. Regulatory authorities enforce these GCP requirements through periodic inspections of trial sponsors, principal investigators and trial sites, including in connection with the review of marketing applications. If we or any of our CROs fail to comply with applicable GCP requirements, or fail to take any such corrective action, the clinical data generated in our clinical trials may be deemed unreliable and the FDA, the EMA, the Pharmaceuticals and Medical Devices Agency in Japan or comparable foreign regulatory authorities may require us to take additional action or perform additional clinical trials before approving our marketing applications. We cannot assure you that upon inspection by a given regulatory authority in the future, 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 for any reason, including due to disruptions caused by the COVID-19 pandemic on their operations or at the sites they are overseeing, 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 stock price would likely be negatively impacted, and 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.

Risks Related to Managing Our Operations

If we are unable to attract and retain qualified key management and scientists, development, medical 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, sales 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 commercialization, 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 several years and anticipate continuing to add additional employees as we focus on achieving our long-term strategic goals. 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 attract and 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, and, to a lesser extent, following our temporary suspension of dosing in our fitusiran program in September 2017. As a result, we may face additional challenges in attracting and retaining employees. In addition, we may not be successful commercializing our approved products and as a result, we may be unable to attract and retain highly qualified sales and marketing professionals to support ONPATTRO, GIVLAARI and our future products, if approved, including lumasiran. Accordingly, we may be unable to attract and retain suitably qualified individuals in order to support our growing research, development and global commercialization efforts and initiatives, and our failure to do so could have an adverse effect on our ability to implement our future business plan.

Moreover, in response to the spread of COVID-19, we have taken temporary precautionary measures intended to help minimize the risk of the virus to our employees and their families, including implementing a global work from home policy for all employees who are able to perform their duties remotely, and restricted on-site staff to only those personnel and contractors who must perform essential activities that must be completed on-site, limited the number of staff in any given laboratory, manufacturing facility or other facility and implemented safety practices and procedures for those individuals who are required to work in our facilities, including but not limited to mandatory health screening, the use of face coverings, physical distancing requirements and increased cleaning protocols. These actions may impair our ability to recruit and/or onboard new employees.

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

As we continue the commercial launches of approved products, and increase the number of product candidates we are developing, we will also need to expand our operations in the U.S. and continue to build operations in the EU and other geographies, including Asia and Latin America. To date, we have received regulatory approval for ONPATTRO in the U.S. and EU and other countries globally, and as a result of the January 2018 amendment to our Sanofi Genzyme collaboration, we now have global development and commercialization rights for ONPATTRO. In addition, we have received regulatory approval for our second RNAi therapeutic, GIVLAARI in the U.S., EU, Brazil, Canada and have also filed for marketing approval in Switzerland. We plan to file for additional regulatory approvals for both ONPATTRO and GIVLAARI in additional countries during 2020 and beyond.

As noted above, we grew our workforce significantly from 2016 through 2019, and anticipate continuing to hire additional employees globally in the future as we focus on the commercialization of ONPATTRO and GIVLAARI and achieving our long-term strategic goals. This growth has placed a strain on our administrative and operational infrastructure and, as a result, we will need to continue to develop additional and/or new infrastructure and capabilities to support our growth and obtain additional space to conduct our global operations in the U.S., the EU, Japan, Latin America 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 we continue the commercialization of ONPATTRO and GIVLAARI, and as the product candidates we develop enter and advance through clinical trials, we will need to continue to expand our global development, regulatory, manufacturing, quality, compliance, and marketing and sales capabilities, or contract with other organizations to provide these capabilities for us. In addition, as our operations expand due to our development progress, we will need to continue 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 enhance our operational, financial and management controls and systems, reporting systems and infrastructure, and policies and procedures. We may not be able to implement enhancements 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, and we are utilizing what we believe is appropriate social media in connection with our commercialization efforts for ONPATTRO and GIVLAARI, and we intend to do the same for our future products, if approved, including lumasiran. Social media practices in the biopharmaceutical industry continue to evolve and regulations and regulatory guidance relating to such use are evolving and not always clear. This evolution creates uncertainty and risk of noncompliance with regulations applicable to our business, resulting in potential regulatory actions against us, along with the potential for litigation related to off-label marketing or other prohibited activities. For example, for our clinical-stage candidates, patients may use social media channels to comment on their experience in an ongoing blinded clinical study or to report an alleged AE. When such disclosures occur, there is a risk that study enrollment may be adversely impacted, we fail to monitor and comply with applicable adverse event reporting obligations or that we may not be able to defend our business 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 online platform, including a blog on the internet, or a post on a website, that can be distributed rapidly and could negatively harm our reputation. 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 or unauthorized or inappropriate use of or access to our systems.

We are increasingly dependent on our information technology systems and infrastructure for our business. We collect, store and transmit sensitive information including intellectual property, proprietary business information and personal information in connection with business operations. The secure maintenance of this information is critical to our operations and business strategy. Some of this information could be an attractive target of criminal attack or unauthorized access and use by third parties with a wide range of motives and expertise, including organized criminal groups, "hacktivists," patient groups, disgruntled current or former employees and others. Cyber-attacks are of ever-increasing levels of sophistication, and despite our security measures, our information technology and infrastructure may be vulnerable to such attacks or may be breached, including due to employee error or malfeasance.

Despite the implementation of security measures, our internal computer systems and those of our contractors and consultants are vulnerable to damage or interruption from computer viruses, unauthorized or inappropriate access or use, natural disasters, pandemics (including COVID-19), 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, security breach or unauthorized or inappropriate use or access to our systems were to result in a loss of or damage to our data, or inappropriate disclosure of confidential or proprietary information, including but not limited to patient, employee or vendor information, we could incur notification obligations to affected individuals and government agencies, liability, including potential lawsuits from patients, collaborators, employees, stockholders or other third parties and liability under foreign, federal and state laws that protect the privacy and security of personal information, 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. The UK officially withdrew from the EU on January 31, 2020, however the effects of the departure on both the EU and the UK are still highly uncertain, as many details of the divorce have yet to be addressed. The 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. 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 affecting 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 significantly 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 financial condition.

Risks Related to Our Industry

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

Any product candidates we or our partners 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/or 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. For example, 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 internal and partnered programs in Phase 3 development, as well as several earlier-stage clinical programs. In December 2019, we reported positive topline results from our ILLUMINATE-A Phase 3 clinical trial for lumasiran, an investigational RNAi therapeutic targeting GO in development for the treatment of PH1, and in September 2020, we reported positive topline results from our ILLUMINATE-B Phase 3 clinical trial for lumasiran for the treatment of PH1 in children under the age of six. Based on the data from the ILLUMINATE-A study, in April 2020, we submitted an NDA, which was accepted by the FDA. The FDA has granted a Priority Review for the NDA and has set an action date of December 3, 2020 under the Prescription Drug User Fee Act, and indicated that they were not planning an advisory committee meeting as part of the NDA review. Additionally, on March 31, 2020, we submitted an MAA for lumasiran with the EMA, which has been validated by the EMA. In October 2020, we announced that the CHMP adopted a positive opinion recommending marketing authorisation of lumasiran for the treatment of PH1. If approved by the EC, lumasiran will be marketed in Europe under the brand name OXLUMO. The CHMP positive opinion was based on an evaluation of the effects of lumasiran in patients with PH1 and its safety profile as demonstrated in both our ILLUMINATE-A and ILLUMINATE-B Phase 3 studies. We expect a decision from the EC on the authorisation recommended by CHMP for lumasiran in the fourth quarter of 2020. However, we may not be able to further advance this or any other product candidate through clinical trials and regulatory approval.

Additionally, several of our planned and ongoing clinical trials utilize an “open-label” trial design. An “open-label” clinical trial is one where both the patient and investigator know whether the patient is receiving the investigational product candidate or either an existing approved drug or placebo. Most typically, open-label clinical trials test only the investigational product candidate and sometimes may do so at different dose levels. Open-label clinical trials are subject to various limitations that may exaggerate any therapeutic effect as patients in open-label clinical trials are aware when they are receiving treatment. Open-label clinical trials may be subject to a “patient bias” where patients perceive their symptoms to have improved merely due to their awareness of receiving an experimental treatment. In addition, open-label clinical trials may be subject to an “investigator

bias” where those assessing and reviewing the physiological outcomes of the clinical trials are aware of which patients have received treatment and may interpret the information of the treated group more favorably given this knowledge. The results from an open-label trial may not be predictive of future clinical trial results with any of our product candidates for which we include an open-label clinical trial when studied in a controlled environment with a placebo or active control.

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. 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, ONPATTRO, GIVLAARI and our current product candidates, including lumasiran, vutrisiran, fitusiran and inclisiran, each employ novel delivery technologies that, with the exception of inclisiran, 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. We conducted a comprehensive evaluation of the revusiran data and reported the results of our evaluation in August 2017. Following our evaluation, we continue to believe that the decision to discontinue development of revusiran does not affect ONPATTRO or any of our other investigational RNAi therapeutic programs in development. In September 2017, we announced that we had temporarily suspended dosing in all ongoing fitusiran studies pending further review of a fatal thrombotic SAE and agreement with regulatory authorities on a risk mitigation strategy. In December 2017, we reached alignment with study investigators and the FDA on safety measures and a risk mitigation strategy to enable resumption of dosing in clinical studies with fitusiran, including our Phase 2 open-label extension, or OLE, study, and the ATLAS Phase 3 program, including protocol-specified guidelines and additional investigator and patient education concerning reduced doses of replacement factor or bypassing agent to treat any breakthrough bleeds in fitusiran studies.

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 or our partners may experience difficulty enrolling our clinical trials, including, but not limited to, the ongoing clinical trials for fitusiran, due to the availability of existing approved treatments, as well as other investigational treatments in development. Moreover, given the temporary suspension of dosing in our fitusiran studies in September 2017 due to a fatal thrombotic SAE, people with hemophilia may be more reluctant to enroll in the ATLAS Phase 3 program of fitusiran. In addition, in November 2018 we announced that due to recruitment challenges, we had discontinued a Phase 2 study of cemdisiran in atypical hemolytic uremic syndrome and are focusing our cemdisiran clinical development efforts in a different indication. Delays or difficulties in patient enrollment or difficulties retaining trial participants, including as a result of the availability of existing or other investigational treatments or safety concerns, including the impact of public health emergencies such as the COVID-19 pandemic, 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 September 2017, we announced that we had temporarily suspended dosing in all ongoing fitusiran studies pending further review of a fatal thrombotic SAE that occurred in a patient with hemophilia A without inhibitors who was receiving fitusiran in our Phase 2 OLE study. In addition, 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 longer 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 follow-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 OLE study for 12 patients who had reached the 12-month endpoint as of the

data transfer date of May 26, 2016. SAEs were observed in 14 patients, one of which, a case of lactic acidosis, was deemed possibly related to the study drug 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 the study drug. The majority of the AEs were mild or moderate in severity; injection 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 discontinuations due to ISRs had occurred as of May 26, 2016.

In our ENVISION Phase 3 study of givosiran in patients with AHP, AEs were reported in 89.6% of givosiran patients and 80.4% of placebo patients; SAEs were reported in 20.8% of givosiran patients and 8.7% of placebo patients. Of the SAEs reported in givosiran patients, there were two cases of chronic kidney disease, or CKD, and one case each of asthma, device-related infection, gastroenteritis, hypoglycemia, abnormal liver function test, major depression, pain management and pyrexia. Three SAEs in givosiran patients were reported as related to study drug: pyrexia, abnormal liver function test and CKD. The two SAEs of CKD noted above were considered serious due to elective hospitalization for diagnostic evaluation. There were no deaths in the study. One patient in the givosiran arm discontinued treatment due to an increase in alanine aminotransferase, or ALT, level greater than eight times the upper limit of normal, a protocol-defined stopping rule. The increase in ALT levels subsequently resolved. AEs reported in greater than 10% of givosiran patients and seen more frequently compared to placebo were nausea, ISRs, CKD, and fatigue. Four of five of the patients with AEs reported as CKD had a prior history of CKD or a baseline estimated glomerular filtration rate less than 60 mL/min/1.73 m². No patients had clinically significant proteinuria and there were no treatment discontinuations due to renal AEs. In June 2020, we announced new data from the OLE period of the ENVISION Phase 3 study, which noted that the safety profile of givosiran in the OLE period was consistent with that observed in the double-blind period, and there were no new safety findings.

In our ALN-VSP clinical trial, one 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 demonstrated by the discontinuation of our revusiran program in October 2016 and the temporary suspension of dosing in September 2017 in our fitusiran studies, the occurrence of SAEs and/or 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. The occurrence of SAEs and/or AEs could also result in refusal by the FDA or a foreign regulatory authority to approve a particular product candidate for any or all indications of use.

Clinical trials also require the review, oversight and approval of IRBs or, outside of the U.S., 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 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, including as a result of the COVID-19 pandemic;
- disruptions caused by man-made or natural disasters or public health pandemics or epidemics or other business interruptions, including the current COVID-19 pandemic;

- high drop-out rates for patients and volunteers in clinical 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 or disruption or delays in the clinical supply due to the COVID-19 pandemic;
- 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, including GCP and cGMP, 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
- interpretations of data by the FDA and similar foreign regulatory agencies that differ from ours.

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 U.S. or foreign regulatory approval for our product candidates and, as a result, we may be unable to commercialize such 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, 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 U.S. 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 the product candidates we are developing will not obtain the regulatory approvals necessary for us or our collaborators to begin selling them.

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 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 development of our product candidates. In addition, because there may be approved treatments for some of the diseases for which we may seek approval, or treatments in development which are approved by the time we apply for 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. In April 2020, we announced that we submitted an NDA for lumasiran, which was accepted by the FDA and granted Priority Review. The FDA has set an action date of December 3, 2020 under the Prescription Drug User Fee Act, and indicated that they were not currently planning an advisory committee meeting as part of the NDA review. Additionally, in March 2020, we submitted an MAA for lumasiran with the EMA, which has been validated by the EMA. In October 2020, we announced that the CHMP adopted a positive opinion recommending marketing authorisation of lumasiran for the treatment of PH1. If approved by the EC, lumasiran will be marketed in Europe under the brand name OXLUMO. The CHMP positive opinion was based on an evaluation of the effects of lumasiran in patients with PH1 and its safety profile as demonstrated in both our ILLUMINATE-A and ILLUMINATE-B Phase 3 studies. We expect a decision from the EC on the authorisation recommended by CHMP for lumasiran in the fourth quarter of 2020. Lumasiran was previously granted an accelerated assessment by the EMA. Interruption

or delays in the operations of the FDA, EMA and comparable foreign regulatory agencies due to the COVID-19 pandemic, may impact the review, inspection and approval timelines for our product candidates, including lumasiran. Any such interruption or delay by the FDA, EMA or comparable foreign regulatory agency in light of COVID-19 pandemic could have a material adverse effect on our efforts to obtain regulatory approval for lumasiran, or our collaborator MDCO's efforts to obtain regulatory approval for inclisiran, which could have a material adverse effect on our financial results.

Any delay or failure in obtaining required approvals for our product candidates could have a material adverse effect on our ability to generate revenues from any product candidate for which we may seek approval in the future. Furthermore, any regulatory approval to market any product may be subject to limitations on the approved uses for which we may market the product or the labeling or other restrictions, which could limit each such product's market opportunity and have a negative impact on our results of operations and our stock price. In addition, the FDA has the authority to require a Risk Evaluation and Mitigations 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 prescriber 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 U.S. and vice versa.

Even if we or our partners obtain regulatory approvals, our marketed drugs will be subject to ongoing regulatory oversight. If we or our partners 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 drugs we or our partners may develop, including ONPATTRO, which was approved in the U.S. and EU in August 2018, and in several other geographies thereafter, and GIVLAARI, which was approved in the U.S. in November 2019, in the EU in March 2020 and in Brazil in July 2020, 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 ONPATTRO, GIVLAARI or other drug products required as a condition of approval or agreed to by us. The regulatory approvals that we receive for ONPATTRO and GIVLAARI, as well as any regulatory approvals we receive for any other product candidates, including lumasiran, 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 good practice quality guidelines and regulations, including 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 U.S., 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. As ONPATTRO and GIVLAARI are used commercially, we or others could identify previously unknown side effects or known side effects could be observed as being more frequent or severe than in clinical studies or earlier post-marketing periods, in which case:

- sales of ONPATTRO or GIVLAARI may be more modest than originally anticipated;
- regulatory approvals for ONPATTRO or GIVLAARI may be restricted or withdrawn;
- we may decide, or be required, to send product warning letters or field alerts to physicians, pharmacists and hospitals;
- additional nonclinical or clinical studies, changes in labeling, adoption of a REMS plan, or changes to manufacturing processes, specifications and/or facilities may be required; and
- government investigations or lawsuits, including class action suits, may be brought against us.

Any of the above occurrences could reduce or prevent sales of ONPATTRO or GIVLAARI, increase our expenses and impair our ability to successfully commercialize either ONPATTRO or GIVLAARI.

The CMO and manufacturing facilities we use to make ONPATTRO, GIVLAARI and certain of our current 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. For example, Agilent and our Cambridge-based facility were subject to regulatory inspection by the FDA and the EMA in connection with the review of our applications for regulatory approval for ONPATTRO and GIVLAARI, and may be subject to similar inspection in connection with any subsequent applications for regulatory approval of ONPATTRO or GIVLAARI filed in other territories or in connection with the pending FDA regulatory application for lumasiran. The discovery of any new or previously unknown problems with our facilities or our CMOs, or our or their manufacturing processes or facilities, may result in restrictions on the drug or CMO or facility, including delay in approval or, in the future, withdrawal of the drug from the market. We have developed cGMP capabilities and processes for the manufacture of patisiran formulated bulk drug product for commercial use. In addition, in April 2016, we completed our purchase of a parcel of land in Norton, Massachusetts, where we are completing construction of a cGMP manufacturing facility for drug substance for clinical and, eventually, 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.

If we or our collaborators, CMOs or service providers fail to comply with applicable continuing regulatory requirements in the U.S. 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 the market perception of such prices and any price increase that we may implement in the future; 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, ONPATTRO utilizes an intravenous mode of administration with pre-medication that physicians and/or patients may not readily adopt, or which may not compete favorably with other available options, including inotersen, marketed by Akcea Therapeutics, Inc. (acquired by Ionis in October 2020), or Akcea, which is administered subcutaneously, or tafamidis, marketed by Pfizer, which is in pill form. In addition, fitusiran represents a new approach to treating hemophilia which may not be readily accepted by patients and their caregivers.

The patient populations suffering from hATTR amyloidosis, AHP and PH1 are small and have not been established with precision. If the actual number of patients is smaller than we estimate, or if we cannot raise awareness of these diseases and diagnosis is not improved, our revenue and ability to achieve profitability from ONPATTRO, GIVLAARI and, if approved, lumasiran, may be adversely affected.

Our estimates regarding the potential market size for ONPATTRO, GIVLAARI or any future products, including lumasiran, at the time we commence commercialization, may be materially different from the actual market size, including as a result of the indication approved by regulatory authorities, 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. For example, the indication approved by the FDA for ONPATTRO is for the treatment of the polyneuropathy of hATTR amyloidosis and not for the treatment of cardiomyopathy or other manifestations of the disease. In addition, the U.S. label does not include data from the exploratory cardiac endpoints included in our APOLLO Phase 3 study. This could have an adverse impact on the market opportunity for ONPATTRO in the U.S. In addition, our efforts to raise disease awareness and improve diagnosis of hATTR amyloidosis have been and may continue to be impacted by the COVID-19 pandemic. For example, Alnylam Act®, our third-party genetic screening initiative in the U.S., Canada and Brazil, experienced a decrease in submitted samples in the second quarter as a result of the COVID-19 pandemic. As is the case with most orphan diseases, if we cannot successfully raise awareness of these diseases and improve diagnosis, it will be more difficult or impossible to achieve profitability.

We may incur significant liability if enforcement authorities allege or determine that we are engaging in commercial activities or promoting our commercially approved products in a way that violates applicable regulations.

Physicians have the discretion to prescribe approved drug products for uses that are not described in the product's labeling and that differ from those approved by the FDA or other applicable regulatory agencies. Off-label uses are common across medical specialties. Although the FDA and other regulatory agencies that approve drug products do not regulate a physician's practice of medicine or choice of treatments, the FDA and other regulatory agencies regulate a manufacturer's communications regarding off-label use and prohibit off-label promotion, as well as the dissemination of false or misleading labeling or promotional materials, including by their agents. Manufacturers and their agents may not promote drugs for off-label uses or provide off-label information in the promotion of drug products that is not consistent with the approved labeling for those products. For example, we may not promote ONPATTRO in the U.S. for use in any indications other than the treatment of the polyneuropathy of hATTR amyloidosis in adults. The FDA and other regulatory and enforcement authorities actively enforce laws and regulations prohibiting promotion of off-label uses and the promotion of products for which marketing approval has not been obtained. A company that is found to have improperly promoted off-label uses may be subject to corrective advertising in addition to significant liability, which may include civil and administrative remedies as well as criminal sanctions.

Notwithstanding regulations related to product promotion, the FDA and other regulatory authorities allow companies to engage in truthful, non-misleading and non-promotional scientific exchange concerning their products, and we intend to engage in medical education activities and communicate with healthcare providers in compliance with all applicable laws and regulatory guidance. Nonetheless, the FDA, other applicable regulatory authorities, competitors, and other third parties may take the position that we are not in compliance with such regulations, and if such non-compliance is proven, it could harm our reputation, financial condition or divert financial and management resources from our core business, and would have a material adverse effect on our business, financial condition and results of operations. Moreover, any threatened or actual government enforcement actions or lawsuits by third parties could also generate adverse publicity, which could decrease demand for our products and require that we devote substantial resources that could be used productively on other aspects of our business.

In addition to our medical education efforts, we also offer patient support services to assist patients receiving treatment with our commercially approved products. Manufacturers have increasingly become the focus of government investigation of patient support programs based on allegations that through such services illegal inducements are provided to physicians and/or patients, leading to improper utilization of government resources through Medicare, Medicaid and other government programs. Companies that are found to have violated laws such as the federal Anti-Kickback Statute and/or False Claims Act, or FCA, face significant liability, including civil and administrative penalties, criminal sanctions, and potential exclusion from participation in government programs. We have designed our programs in a manner that we believe complies with all applicable laws and regulations and have implemented a robust compliance program to support a compliant corporate culture and compliance with such laws.

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 we market and sell ONPATTRO and GIVLAARI and as several of our other programs move through 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 such programs for a number of years. We might obtain regulatory approval for a product, including ONPATTRO and GIVLAARI, 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 ONPATTRO, GIVLAARI or any future products, including lumasiran, successfully also will depend in part on the extent to which reimbursement for these products and related treatments will be available from government health administration authorities, private health insurers and other organizations. ONPATTRO, GIVLAARI and other products for which we are able to obtain marketing approval, including lumasiran, may not be considered cost-effective,

and the amount reimbursed may be insufficient to allow us to sell ONPATTRO, GIVLAARI or any future products, including lumasiran on a competitive basis. Increasingly, the third-party payors who pay for or 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. In the U.S., we have entered into more than ten VBAs and are negotiating additional VBAs for ONPATTRO with certain private health insurers. In addition, we have entered into nine VBAs and are negotiating additional VBAs for GIVLAARI. The goal of these agreements is to ensure that we are paid based on the ability of our commercially approved products to deliver results in the real world setting comparable to those demonstrated in clinical trials. Partnering with payors on these agreements is intended to provide more certainty to them for their investment, and help accelerate coverage decisions for patients. The agreements are structured to link our commercially approved products' performance in real-world use to financial terms. If the price we are able to charge for ONPATTRO, GIVLAARI or any other products we develop, including lumasiran, 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. In addition, we have stated publicly that we intend to grow through continued scientific innovation rather than arbitrary price increases. Specifically, we have stated that we will not raise the price of any product for which we receive marketing approval over the rate of inflation, as determined by the consumer price index for urban consumers (approximately 2.2% currently) absent a significant value driver. Our patient access philosophy could also negatively impact the revenues we are able to generate from the sale of one or more of our products in the future.

Some of the drugs we market need to be administered under the supervision of a physician or other healthcare professional on an outpatient basis, including ONPATTRO and GIVLAARI. 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 U.S. On July 24, 2020, President Trump signed four Executive Orders aimed at lowering drug prices. The Executive Orders direct the Secretary of Health and Human Services to: eliminate protection under an Anti-Kickback Statute safe harbor for certain retrospective price reductions provided by drug manufacturers to sponsors of Medicare Part D plans or pharmacy benefit managers that are not applied at the point-of-sale; allow the importation of certain drugs from other countries through individual waivers, permitting the re-importation of insulin products, and prioritizing finalization of the proposed rule to permit the importation of drugs from Canada; depending on whether pharmaceutical manufacturers agree to other measures, ensure that payment by the Medicare program for certain Medicare Part B drugs is not higher than the payment by other designated countries; and allow certain low-income individuals receiving insulin and epinephrine purchased by a Federally Qualified Health Center, or FQHC, as part of the 340B drug program to purchase those drugs at the discounted price paid by the FQHC. On September 13, 2020, President Trump signed an Executive Order that directs the Secretary of Health and Human Services to immediately "take appropriate steps to implement rulemaking" to test a demonstration project through the CMS Innovation Center whereby Medicare Part B reimbursement for "certain high-cost prescription drugs" would be no more than most-favored-nation price (i.e., the lowest price) after adjustments, for a pharmaceutical product that the drug manufacturer sells in a member country of the Organization for Economic Cooperation and Development that has a comparable per-capita gross domestic product. The Medicare Modernization Act, or MMA, contains provisions that call for the promulgation of regulations that expand pharmacists' and wholesalers' ability to import cheaper versions of an approved drug and competing products from Canada, where there are government price controls. Further, the MMA provides that these changes to U.S. importation laws will not take effect, unless and until the Secretary of the HHS certifies that the changes will pose no additional risk to the public's health and safety and will result in a significant reduction in the cost of products to consumers. On September 23, 2020, the Secretary of the HHS made such certification to Congress, and on October 1, 2020, the FDA published a final rule that allows for the importation of certain prescription drugs from Canada. However, certain categories of drug products are excluded from the definition of "prescription drug" that can potentially be imported from Canada, including intravenously injected drugs, such as ONPATTRO. Under the final rule, States and Indian tribes, and in certain future circumstances pharmacists and wholesalers, may submit importation program proposals to the FDA for review and authorization. On September 25, 2020, CMS stated drugs imported by States under this rule will not be eligible for federal rebates under Section 1927 of the Social Security Act

and manufacturers would not report these drugs for “best price” or Average Manufacturer Price purposes. Since these drugs are not considered covered outpatient drugs, CMS further stated it will not publish a National Average Drug Acquisition Cost for these drugs. Separately, the FDA also issued a final guidance document. Separately, the FDA also issued a final guidance document outlining a pathway for manufacturers to obtain an additional National Drug Code for an FDA-approved drug that was originally intended to be marketed in a foreign country and that was authorized for sale in that foreign country. The market implications of the notice of Executive Orders and the final rule and guidance are unknown at this time, but legislation, regulations or policies allowing the reimportation of drugs, if enacted and implemented, could decrease the price we receive for our products and adversely affect our future revenues and prospects for profitability. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement rates. Our inability to promptly obtain coverage or adequate reimbursement rates from both government-funded and private payors for ONPATTRO, GIVLAARI or other new drugs that we develop, including lumasiran, 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. Specifically, there have been several recent U.S. Congressional inquiries and proposed federal and state legislation designed to, among other things, bring more transparency to drug pricing, reduce the cost of prescription drugs under Medicare, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs.

A number of other legislative and regulatory changes in the healthcare system in the U.S. and other major healthcare markets have been proposed or enacted in recent months and 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 U.S. in 2010. These developments could, directly or indirectly, affect our ability to sell ONPATTRO, GIVLAARI or future products, if approved, including lumasiran, at a favorable price.

In particular, in March 2010, the Patient Protection and Affordable Care Act, also referred to as the Affordable Care Act, or the ACA, 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. Among the provisions affecting pharmaceutical companies are 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 FDA, 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 law creates a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected.
- The law expands eligibility criteria for Medicaid programs by, among other things, allowing states to offer Medicaid coverage to certain individuals with income at or below 133% of the federal poverty level, thereby potentially increasing a manufacturer’s Medicaid rebate liability.
- The law expands the entities eligible for discounts under the Public Health Service Act pharmaceutical pricing program.
- The law expands healthcare fraud and abuse laws, including the civil FCA and the federal Anti-Kickback Statute, new government investigative powers, and enhanced penalties for noncompliance.

- The law establishes new requirements to report financial arrangements with physicians and teaching hospitals and to annually report drug samples that manufacturers and distributors provide to physicians.
- The law establishes a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research.
- The law established the Center for Medicare and Medicaid Innovation within the Centers for Medicare and Medicaid Services, or CMS, to test innovative payment and service delivery methods.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. In August 2011, the Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least \$1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. These changes included aggregate reductions to Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013 and will remain in effect through 2030; however, these Medicare sequester reductions have been suspended from May 1, 2020 through December 31, 2020 due to the COVID-19 pandemic. The American Taxpayer Relief Act of 2012, among other things, reduced Medicare payments to several providers and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. These new laws may result in additional reductions in Medicare and other healthcare funding and otherwise affect the prices we may obtain for ONPATTRO, GIVLAARI or any of our product candidates for which we may obtain regulatory approval, including lumasiran, or the frequency with which ONPATTRO, GIVLAARI or any future product, including lumasiran, is prescribed or used.

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 U.S.

Since its enactment, there have been numerous judicial, administrative, executive, and legislative challenges to certain aspects of the ACA, and we expect there will be additional challenges and amendments to the ACA in the future. Various portions of the ACA are currently undergoing legal and constitutional challenges in the Fifth Circuit Court and the United States Supreme Court; the Trump Administration has issued various Executive Orders which eliminated cost sharing subsidies and various provisions that would impose a fiscal burden on states or a cost, fee, tax, penalty or regulatory burden on individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices; and Congress has introduced several pieces of legislation aimed at significantly revising or repealing the ACA. It is unclear whether the ACA will be overturned, repealed, replaced, or further amended. We cannot predict what affect further changes to the ACA would have on our business. The costs of prescription pharmaceuticals in the U.S. have also been the subject of considerable discussion in the U.S., and members of Congress and the Trump administration have stated that they will address such costs through new legislative and administrative measures. To date, there have been several U.S. Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the costs of drugs under Medicare and reform government program reimbursement methodologies for drug products. At the federal level, Congress and the Trump administration have each indicated that it will continue to pursue new legislative and/or administrative measures to control drug costs. The Trump administration released a "Blueprint," or plan, to reduce the cost of drugs, increase drug manufacturer competition, increase the negotiating power of certain federal healthcare programs, incentivize manufacturers to lower the list price of their products, and reduce the out of pocket costs of drug products paid by consumers. The Trump administration's Blueprint contains certain measures that the U.S. Department of Health and Human Services is already working to implement. Although some proposals related to the administration's Blueprint may require additional authorization to become effective, may ultimately be withdrawn, or may face challenges in the courts, the Congress and the Trump administration have indicated that they will continue to seek new legislative and administrative measures to control drug costs. For example, at the federal level, the U.S. government's budget proposal for fiscal year 2021 includes a \$135 billion allowance to support legislative proposals seeking to reduce drug prices, increase competition, lower out-of-pocket drug costs for patients, and increase patient access to lower-cost generic and biosimilar drugs. On March 10, 2020, the U.S. government sent "principles" for drug pricing to Congress, calling for legislation that would, among other things, cap Medicare Part D beneficiary out-of-pocket pharmacy expenses, provide an option to cap Medicare Part D beneficiary monthly out-of-pocket expenses, and place limits on pharmaceutical price increases.

At the state level, legislatures have become increasingly aggressive in passing legislation and implementing regulations designed to control pharmaceutical and biological product pricing. Some of these measures include price or patient reimbursement constraints, discounts, restrictions on certain product access, marketing cost disclosure and transparency measures, and, in some cases, measures designed to encourage importation from other countries and bulk purchasing. In addition, regional health care authorities and individual hospitals are increasingly using bidding procedures to determine what

pharmaceutical products and which suppliers will be included in their prescription drug and other health care programs. These measures could reduce the ultimate demand for our products, once approved, or put pressure on our product pricing.

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 U.S. to increase pressure on drug pricing. Such reforms could have an adverse effect on anticipated revenues from ONPATTRO, GIVLAARI or other 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.

We are subject to U.S. and certain foreign export and import controls, sanctions, embargoes, anti-corruption laws, and anti-money laundering laws and regulations. Compliance with these legal standards could impair our ability to compete in domestic and international markets. We can face criminal liability and other serious consequences for violations, which can harm our business.

We are subject to export control and import laws and regulations, including the U.S. Export Administration Regulations, U.S. Customs regulations, various economic and trade sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Controls, the FCPA, the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act, and other state and national anti-bribery and anti-money laundering laws in the countries in which we conduct activities. Anti-corruption laws are interpreted broadly and prohibit companies and their employees, agents, contractors, and other collaborators from authorizing, promising, offering, or providing, directly or indirectly, improper payments or anything else of value to recipients in the public or private sector. From time to time, we may engage third parties for clinical trials outside of the United States, to sell our products abroad, and/or to obtain necessary permits, licenses, patent registrations, and other regulatory approvals. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We can be held liable for the corrupt or other illegal activities of our employees, agents, contractors, and other collaborators, even if we do not explicitly authorize or have actual knowledge of such activities. Any violations of the laws and regulations described above may result in substantial civil and criminal fines and penalties, imprisonment, the loss of export or import privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences.

Governments outside the U.S. may impose strict price controls, which may adversely affect our revenues, if any.

The pricing of prescription pharmaceuticals is also subject to governmental control outside the U.S. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of regulatory approval for a product. To obtain reimbursement or pricing approval in some countries, we may be required to conduct a clinical trial that compares the cost-effectiveness of our product candidates to other available therapies. If reimbursement of our products is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, our ability to generate revenues and become profitable could be impaired.

In some countries, including Member States of the EU, or Japan, the pricing of prescription drugs is subject to governmental control. Additional countries may adopt similar approaches to the pricing of prescription drugs. In such countries, pricing negotiations with governmental authorities can take considerable time after receipt of regulatory approval for a product. In addition, there can be considerable pressure by governments and other stakeholders on prices and reimbursement levels, including as part of cost containment measures. Moreover, political, economic and regulatory developments may further complicate pricing negotiations, and pricing negotiations may continue after coverage and reimbursement have been obtained. Reference pricing used by various countries and parallel distribution, or arbitrage between low-priced and high-priced countries, can further reduce prices. In some countries, we may be required to conduct a clinical study or other studies that compare the cost-effectiveness of a product candidate to other available therapies in order to obtain or maintain reimbursement or pricing approval, which is time-consuming and costly. We cannot be sure that such prices and reimbursement will be acceptable to us or our strategic partners. Publication of discounts by third-party payors or authorities may lead to further pressure on the prices or reimbursement levels within the country of publication and other countries. If pricing is set at unsatisfactory levels or if reimbursement of our products is unavailable or limited in scope or amount, our revenues from sales by us or our strategic partners and the potential profitability of ONPATTRO, GIVLAARI or any future products, including lumasiran, in those countries would be negatively affected. Another impact from the tightening pricing control could be felt from greater competition from less expensive generic or biosimilar products once the exclusivity expires; the governments have adopted policies to switch prescribed products to generic versions in order to cut the medical cost.

If we or our collaborators, CMOs or service providers fail to comply with healthcare laws and regulations, or legal obligations related to privacy, data protection and information security, 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, in addition to legal obligations related to privacy, data protection and information security. These laws and regulations include:

- The U.S. federal Anti-Kickback Statute, which prohibits, among other things, persons from knowingly and willfully 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, including the FCA, 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, making, using or causing to be made or used a false record or statement material to a false or fraudulent claim to the federal government, or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government. Manufacturers can be held liable under the FCA even when they do not submit claims directly to government payors if they are deemed to “cause” the submission of false or fraudulent claims. The FCA also permits a private individual acting as a “whistleblower” to bring actions on behalf of the federal government alleging violations of the FCA and to share in any monetary recovery.
- The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created federal criminal statutes that prohibit knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program or obtain, by means of false or fraudulent pretenses, representations, or promises, any of the money or property owned by, or under the custody or control of, any healthcare benefit program, regardless of the payor (e.g., public or private) and knowingly and willfully falsifying, concealing or covering up by any trick or device a material fact or making any materially false statements in connection with the delivery of, or payment for, healthcare benefits, items or services relating to healthcare matters. Similar to the federal Anti-Kickback Statute, a person or entity can be found guilty of violating HIPAA without actual knowledge of the statute or specific intent to violate it.
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, which imposes requirements relating to the privacy, security, and transmission of individually identifiable health information; and requires notification to affected individuals and regulatory authorities of certain breaches of security of individually identifiable health information.
- The U.S. federal Open Payments requirements, which were implemented by the CMS pursuant to the Physician Payments Sunshine Act as part of the ACA. 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 must report all transfers of value, including consulting fees, travel reimbursements, research grants, and other payments made to physicians (currently defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals as well as ownership and investment interests held by physicians and their immediate family members. Legislation passed in 2018 expands the scope of covered recipients to non-physician provider such as physician assistants and advanced practice nurses, effective in 2022.
- Federal statutory and regulatory requirements applicable to pricing and sales of product to Federal Government Agencies.
- Federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers.
- 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 privacy 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, patient data privacy and security.
- European Privacy Laws including Regulation 2016/679, known as the General Data Protection Regulation, or the GDPR, and the e-Privacy Directive (2002/58/EC), and the national laws implementing each of them, as well as the privacy laws of Japan and other territories. Failure to comply with our obligations under the privacy regime could expose us to significant fines and/or adverse publicity, which could have material adverse effects on our reputation and business.
- The California Consumer Privacy Act of 2018, or CCPA, effective as of January 1, 2020, that gives California residents expanded rights to access and require deletion of their personal information, opt out of certain personal information sharing, and receive detailed information about how their personal information is used. The CCPA provides for civil penalties for violations, as well as a private right of action for data breaches that is expected to increase data breach litigation.

Some state laws also require pharmaceutical manufacturers to comply with the pharmaceutical industry’s voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, in addition to requiring manufacturers to report information related to payments to physicians and other healthcare providers or marketing expenditures

and pricing information. State and foreign laws also govern the privacy and security of health information, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

In the EU, the GDPR replaced the EU Data Protection Directive on May 25, 2018. The GDPR introduced new data protection requirements in the EU, as well as potential fines for noncompliance of up to the greater of €20,000,000 or 4% of total annual global revenue. The regulation imposes numerous new requirements for the collection, use and disclosure of personal information, including: more stringent requirements relating to data subject consent; what information must be shared with data subjects regarding how their personal information is used; the obligation to notify regulators and affected individuals of personal data breaches; extensive new internal privacy governance obligations; and obligations to honor expanded rights of individuals in relation to their personal information (e.g., the right to access, correct and delete their data). In addition, the GDPR maintains the EU Data Protection Directive's restrictions on cross-border data transfer. The GDPR increases the responsibility and liability of pharmaceutical companies in relation to processing personal data, and companies may be required to put in place additional mechanisms to ensure compliance with the new EU data protection rules. Further, Brexit has created uncertainty with regard to the status of the UK as an "adequate country" for the purposes of data transfers outside the EEA. In particular, it is unclear how data transfers to and from the UK will be regulated. These changes may require us to find alternative bases for the compliant transfer of personal data from the UK to the U.S., and we are monitoring developments in this area.

If our operations are found to be in violation of any of the aforementioned requirements, we may be subject to penalties, including civil or criminal penalties (including individual imprisonment), 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. We are continuing to establish our global compliance infrastructure following the commercial launches of ONPATTRO in the third quarter of 2018, and GIVLAARI in December 2019, and as we prepare for the launch of our products in additional countries, assuming regulatory approvals. 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 ONPATTRO GIVLAARI, or any other future 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;
- untitled letters or 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.

We are subject to governmental regulation and other legal obligations, particularly related to privacy, data protection and information security, and we are subject to consumer protection laws that regulate our marketing practices and prohibit

unfair or deceptive acts or practices. Our actual or perceived failure to comply with such obligations could harm our business.

The GDPR imposes strict requirements on controllers and processors of personal data, including special protections for “special category data,” which includes health, biometric and genetic information of data subjects located in the EU. Further, GDPR provides a broad right for EU Member States to create supplemental national laws, such as laws relating to the processing of health, genetic and biometric data, which could further limit our ability to use and share such data or could cause our costs to increase, and harm our business and financial condition. GDPR grants individuals the opportunity to object to the processing of their personal information, allows them to request deletion of personal information in certain circumstances, and provides the individual with an express right to seek legal remedy in the event the individual believes his or her rights have been violated. Further, the GDPR imposes strict rules on the transfer of personal data out of the EU to the U.S. or other regions that have not been deemed to offer “adequate” privacy protections.

Failure to comply with the requirements of the GDPR and the related national data protection laws of the EU Member States, which may deviate slightly from the GDPR, may result in fines of up to 4% of total global annual revenue, or €20,000,000, whichever is greater, and in addition to such fines, we may be the subject of litigation and/or adverse publicity, which could have material adverse effect on our reputation and business. As a result of the implementation of the GDPR, we are required to put in place additional mechanisms to ensure compliance with the new data protection rules. For example, the GDPR requires us to make more detailed disclosures to data subjects, requires disclosure of the legal basis on which we can process personal data, may make it harder for us to obtain valid consent for processing, will require the appointment of a data protection officer where sensitive personal data (i.e., health data) is processed on a large scale, introduces mandatory data breach notification requirements throughout the EU, imposes additional obligations on us when we are contracting with service providers and requires us to adopt appropriate privacy governance including policies, procedures, training and data audit.

We are subject to the supervision of local data protection authorities in those jurisdictions where we are monitoring the behavior of individuals in the EU (i.e., undertaking clinical trials). We depend on a number of third parties in relation to the provision of our services, a number of which process personal data of EU individuals on our behalf. With each such provider we enter or intend to enter into contractual arrangements under which they are contractually obligated to only process personal data according to our instructions, and conduct or intend to conduct diligence to ensure that they have sufficient technical and organizational security measures in place.

We are also subject to evolving European privacy laws on electronic marketing and cookies. The EU is in the process of replacing the e-Privacy Directive (2002/58/EC) with a new set of rules taking the form of a regulation, which will be directly implemented in the laws of each European member state, without the need for further enactment. While the e-Privacy Regulation was originally intended to be adopted on May 25, 2018 (alongside the GDPR), it is still going through the European legislative process. Draft regulations were rejected by the Permanent Representatives Committee of the Council of EU on November 22, 2019; it is not clear when new regulations will be adopted in 2020.

There is significant uncertainty related to the manner in which data protection authorities will seek to enforce compliance with GDPR. Further, Brexit has created uncertainty with regard to the status of the UK as an ‘adequate country’ for the purposes of data transfers outside the EEA. In particular, it is unclear how data transfers to and from the UK will be regulated. Enforcement uncertainty and the costs associated with ensuring GDPR and e-Privacy compliance may be onerous and may adversely affect our business, financial condition, results of operations and prospects.

Compliance with U.S. and international data protection laws and regulations could require us to take on more onerous obligations in our contracts, restrict our ability to collect, use and disclose data, or in some cases, impact our ability to operate in certain jurisdictions. Failure to comply with these laws and regulations could result in government enforcement actions (which could include civil, criminal and administrative penalties), private litigation, and/or adverse publicity and could negatively affect our operating results and business. Moreover, clinical trial subjects, employees and other individuals about whom we or our potential collaborators obtain personal information, as well as the providers who share this information with us, may limit our ability to collect, use and disclose the information. Claims that we have violated individuals’ privacy rights, failed to comply with data protection laws, or breached our contractual obligations, even if we are not found liable, could be expensive and time-consuming to defend and could result in adverse publicity that could harm our business.

Our ability to obtain services, reimbursement or funding from the federal government may be impacted by possible reductions in federal spending and services, and any inability on our part to effectively adapt to such changes could substantially affect our financial position, results of operations and cash flows.

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% per fiscal year, starting in 2013 (however, these Medicare sequester reductions have been suspended from May 1, 2020 through December 31, 2020 due to the COVID-19 pandemic). Certain of these automatic cuts have been implemented resulting in reductions in Medicare payments to physicians, hospitals, and other healthcare providers, among other things. Due to legislation amending the statute, including the Bipartisan Budget Act of 2018,

these reductions will stay in effect through 2030 unless additional Congressional action is taken. 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 the 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 ONPATTRO, GIVLAARI and any other products we may develop, including lumasiran.

Separately, in response to the COVID-19 pandemic, on March 10, 2020 the FDA announced its intention to postpone most inspections of foreign manufacturing facilities and products through April 2020. On March 18, 2020, the FDA announced its intention to temporarily postpone routine surveillance inspections of domestic manufacturing facilities and provided guidance regarding the conduct of clinical trials. As of June 23, 2020, the FDA noted it was conducting mission critical domestic and foreign inspections to ensure compliance of manufacturing facilities with FDA quality standards. On July 10, 2020, the FDA announced its goal of restarting domestic on-site inspections during the week of July 20, 2020, but such activities will depend on data about the virus' trajectory in a given state and locality and the rules and guidelines that are put in place by state and local governments. The FDA has developed a rating system to assist in determining when and where it is safest to conduct prioritized domestic inspections. Should the FDA determine that an inspection is necessary for approval and an inspection cannot be completed during the review cycle due to restrictions on travel, the FDA has stated that it generally intends to issue a complete response letter. Further, if there is inadequate information to make a determination on the acceptability of a facility, the FDA may defer action on the application until an inspection can be completed. Several manufacturers, to date, have received complete response letters due to the FDA's inability to conduct required inspections. Regulatory authorities outside the U.S. may adopt similar restrictions or other policy measures in response to the COVID-19 pandemic. Additionally, as of June 23, 2020, the FDA noted it was continuing to ensure timely reviews of applications for medical products during the COVID-19 pandemic in line with its user fee performance goals; however, the FDA may not be able to continue its current pace and review timelines could be extended. If a prolonged government shutdown occurs, or if global health concerns related to COVID-19 continue to prevent the FDA or other regulatory authorities from conducting certain aspects of their regular review and approval processes within specified or customary time periods, it could significantly impact the ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business. Resolving such delays could force us or our collaborators to incur significant costs, could limit our allowed activities or the allowed activities of our collaborators, could diminish any competitive advantages that we or our collaborators may attain or could adversely affect our business, financial condition, results of operations and prospects, the value of our common stock and our ability to bring new products to market as forecasted. Even without such delay, there is no guarantee we will receive approval for our product candidates on a timely basis, or at all.

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 in August 2017, however, our investigation did not result in a conclusive explanation regarding the cause of the mortality imbalance observed in the ENDEAVOUR Phase 3 study. In addition, in September 2017, we announced that we had temporarily suspended dosing in all ongoing fitusiran studies pending further review of a fatal thrombotic SAE and agreement with regulatory authorities on a risk mitigation strategy. 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 our clinical trials, including the revusiran and fitusiran studies, it is possible that product liability claims will be asserted against us relating to the worsening of a patient's condition, injury or death alleged to have been caused by one of our product candidates, including revusiran or fitusiran. Such claims might not be fully covered by product liability insurance. If we succeed in marketing products, including ONPATTRO and GIVLAARI, 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, including the marketing and sale of ONPATTRO and GIVLAARI. 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.

Our employees may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements or insider trading violations, which could significantly harm our business.

We are exposed to the risk of employee fraud or other misconduct. Misconduct by employees could include intentional failures to comply with governmental regulations, comply with healthcare fraud and abuse and anti-kickback laws and regulations in the U.S. and abroad, or failure to report financial information or data accurately or disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, misconduct, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Employee misconduct could also involve the improper use of, including improper trading based upon, information obtained in the course of clinical studies, which could result in regulatory sanctions and serious harm to our reputation. We have adopted a code of business conduct and ethics and a robust compliance program, but it is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to comply with these laws or regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and results of operations, including the imposition of significant fines or other sanctions.

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

Our research, development and manufacturing 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 and Norton 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 and Norton facilities comply with the relevant guidelines of the City of Cambridge, the town of Norton, 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 compositions, methods and technologies that we develop under the patent and other intellectual property laws of the U.S. 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 subject matter 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 or our licensees may be required to obtain licenses under third-party patents to market ONPATTRO or GIVLAARI or further develop and commercialize future products such as lumasiran and inclisiran, currently under review with the FDA, or continuing to develop candidates in our pipeline being developed by us or our licensees. If licenses are not available to us or not available on reasonable terms, we or our licensees 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 United States Patent and Trademark Office, or 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, could reduce or eliminate royalty payments to us from third party licensors 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 U.S. 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, or AIA, included a number of changes to the patent laws of the U.S. 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 AIA, which took effect in March 2013, changed U.S. 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 regarding 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.

Failure to obtain and maintain all available regulatory exclusivities, broad patent scope and to maximize patent term restoration or extension on patents covering our products may lead to loss of exclusivity and early generic entry resulting in a loss of market share and/or revenue.

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 Ltd., Ionis, the Massachusetts Institute of Technology, or MIT, Whitehead Institute for Biomedical Research, or Whitehead, Max Planck Innovation GmbH (formerly known as Garching Innovation GmbH), or Max Planck, 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 U.S. 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, re-examination and opposition proceedings, as well as *inter partes* and post-grant review proceedings introduced by provisions of the AIA, which became available to third party challengers on September 16, 2012, in various patent offices relating to patent rights in the RNAi field. In addition, third parties may challenge the validity of our patents. For example, a third party has filed an opposition in the EPO against our owned patent EP 2723758, with claims directed to compositions and methods of ANGPTL3, arguing that the granted claims are invalid. 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. 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 marketed products ONPATTRO and GIVLAARI, our late-stage therapeutic candidates being developed by us or our licensees, including lumasiran, inclisiran and fitusiran, as well as our other pipeline products. 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 candidates or marketed products, including ONPATTRO and GIVLAARI, or further develop and commercialize future products such as lumasiran and inclisiran, currently under review with the FDA, or continuing to develop candidates in our pipeline being developed by us or our licensees. 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 reasonable 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, including ONPATTRO or GIVLAARI, or perform research and development or other activities covered by such patents. For example, during 2017 and 2018, Silence Therapeutics plc, or Silence, filed claims in several jurisdictions, including the High Court of England and Wales, and named us and our wholly owned subsidiary Alnylam UK Ltd. as co-defendants. Silence alleged various claims, including that ONPATTRO infringed one or more Silence patents. There were also a number of related actions brought by us or Silence in connection with this intellectual property dispute. In December 2018, we entered into a Settlement and License Agreement with Silence, resolving all ongoing claims, administrative proceedings, and regulatory proceedings worldwide between us regarding, among other issues, patent infringement, patent invalidity and breach of contract.

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. For example, in October 2017 Silence sued us in the UK alleging that ONPATTRO and other investigational RNAi therapeutics we or MDCO are developing infringed one or more Silence patents. 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 to protect our rights in the RNAi assets we purchased from Merck Sharp & Dohme Corp., or Merck. We and Dicerna settled the ongoing litigation between us in April 2018 and in December 2018 we and Silence settled all ongoing litigation between us. A third party may also claim that we have improperly obtained or used its confidential or proprietary information. For example, in March 2011, Arbutus Biopharma Corp., or Arbutus, 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 fourth quarter of 2012.

In protecting our intellectual patent rights through litigation or other means, a third party may claim that we have improperly asserted our rights against them. For example, in August 2017, Dicerna successfully added counterclaims against us in the above-referenced trade secret lawsuit alleging that our lawsuit represented abuse of process and claiming tortious interference with its business. In addition, in August 2017, Dicerna filed a lawsuit against us in the United States District Court

of Massachusetts alleging attempted monopolization by us under the Sherman Antitrust Act. As noted above, in April 2018, we and Dicerna settled the ongoing litigation between us.

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 the University of Massachusetts, 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 and Dicerna 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 or legal proceeding could delay our research, development and commercialization 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 issue an injunction requiring us to stop the infringing activity or obtain a license. Any license required under any patent may not be made available on commercially reasonable 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, commercializing and protecting our RNAi technology, as well as ONPATTRO, GIVLAARI and any other 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. Moreover, we could incur significant costs and/or disruption to our business and distraction of our management defending against any breach of such licenses alleged by the licensor. For example, in June 2018, Ionis sent us a notice claiming that it was owed payments under our second amended and restated strategic collaboration and license agreement as a result of the January 2018 amendment of our collaboration agreement with Sanofi Genzyme and the related Exclusive TTR License and AT3 License Terms. Ionis claimed it was owed technology access fees, or TAF's, based on rights granted and amounts paid to us in connection with the Sanofi Genzyme restructuring. In November 2018, we received notice that Ionis had filed a Demand for Arbitration with the Boston office of the American Arbitration Association against us, asserting, among other things, breach of contract. In December 2018, we filed our answer to Ionis's Demand for Arbitration, denying any liability to Ionis. The hearing portion of the arbitration process was completed in June 2020, and post-hearing briefing was completed in the third quarter of 2020. On October 23, 2020, a partial award was issued by the arbitration panel, which ruled in favor of Ionis's request for a TAF on certain rights the panel determined we received in the Sanofi restructuring (but rejecting the TAF amount sought by Ionis), and in favor of us in denying Ionis's request for a TAF on a milestone payment received by us in the same restructuring. The panel's partial award also denied Ionis's request for pre-judgement interest and attorney's fees. As of November 4, 2020, the arbitration panel had not yet determined the amount of damages to be awarded. We anticipate the amount to be determined by the panel in the fourth quarter of 2020. Based on the panel's partial award, we increased the estimated contingent liability for this matter. Please read Note 14 to our condensed consolidated financial statements included in Part I, Item 1, "Financial Statements (Unaudited)," of this Quarterly Report on Form 10-Q for additional information regarding this estimated contingent liability.

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 ONPATTRO, GIVLAARI or 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 ONPATTRO, GIVLAARI or other 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. There are a number of drugs currently under development, which 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 developed ONPATTRO for the treatment of hATTR amyloidosis. In August 2018, the FDA approved ONPATTRO lipid complex injection for the treatment of the polyneuropathy of hATTR amyloidosis in adults, and the EC granted marketing authorisation for ONPATTRO for the treatment of hATTR amyloidosis in adults with stage 1 or stage 2 polyneuropathy. We are aware of other approved products used to treat this disease, including tafamidis, marketed by Pfizer, which is now approved in the U.S., the EU, Japan, Brazil, Argentina, Israel, Russia, South Korea and certain countries in Latin America, and inotersen, developed and marketed by Ionis, which is now approved in the U.S., the EU, Canada and Brazil, as well as product candidates in various stages of clinical development, including an additional investigational drug. Finally, we are aware that Eidos Therapeutics, Inc., or Eidos, initiated a Phase 3 clinical trial of acoramidis, a TTR stabilizer, in ATTR-CM in February 2019, and expects enrollment of the Phase 3 clinical trial in ATTR-CM to be completed in the first half of 2021. Eidos also plans to initiate a Phase 3 clinical trial of acoramidis in ATTR-PN patients in the second half of 2020. While we believe that ONPATTRO has and will continue to have a competitive product profile, it is possible it will not compete favorably with these products and product candidates, or others, and, as a result, may not achieve commercial success. Moreover, positive data and/or the commercial success of competitive products could negatively impact our stock price.

If we continue to 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;

- the price of our products relative to alternative approved therapies;
- reimbursement coverage; and
- patent position.

We are aware of product candidates in various stages of clinical development for the treatment of PH1 which would compete with lumasiran, our investigational RNAi therapeutic now in registration for the treatment of this disease, including Oxabact®, a bacteria-based investigational therapy in Phase 3 development by OxThera AB, reloxaliase an investigational enzyme therapy in Phase 3 development for primary or severe secondary hyperoxaluria by Allena Pharmaceuticals, Inc., and nedosiran, an investigational RNAi therapeutic in development by Dicerna for the treatment of PH. In July 2019, the FDA granted a Breakthrough Therapy Designation to nedosiran for the treatment of patients with PH, and in November 2019, Dicerna announced that it initiated dosing in PHYOX2 pivotal clinical trial of nedosiran that is expected to complete enrollment of approximately 36 patients with PH1 and PH type 2 by the end of the fourth quarter of 2020. In April 2020, we and Dicerna granted each other a non-exclusive cross-license to our respective intellectual property related to our lumasiran product candidate, and Dicerna's nedosiran product candidate. 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. In addition, our competitors may develop strategic alliances with or receive funding from larger pharmaceutical or biotechnology companies, providing them with an advantage over us. 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, but are not limited to, Takeda Pharmaceutical Company Ltd., or Takeda, Marina Biotech, Inc., Arrowhead Pharmaceuticals, Inc., or Arrowhead, and its subsidiary, Calando Pharmaceuticals, Inc., or Calando, Quark Pharmaceuticals, Inc., or Quark, Silence, Arbutus, Sylentis, S.A.U., or Sylentis, Dicerna and its collaborators, WAVE Life Sciences Ltd., Arcturus Therapeutics, Inc., and Genevant Sciences, launched by Arbutus and Roivant Sciences. In addition, we granted licenses or options for licenses to Ionis, Benitec Biopharma 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, Takeda has obtained a non-exclusive license, and Arrowhead, as the assignee of Novartis AG, has obtained specific exclusive licenses for 30 gene targets, that include access to certain aspects of our technology. We also compete with companies working to develop antisense-based drugs. Like RNAi therapeutics, antisense drugs target mRNAs in order to suppress the activity of specific genes. Akcea (acquired by Ionis in October 2020) has received marketing approval for an antisense drug, inotersen that was developed by Ionis, in the U.S., the EU, Canada and Brazil, for the treatment of stage 1 or stage 2 polyneuropathy in adult patients with hATTR amyloidosis. Several antisense drugs developed by Ionis have been approved and are currently marketed, and Ionis has multiple antisense product candidates in clinical trials. 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 in 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 sector 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. For example, the trading price for our common stock and the common stock of other biopharmaceutical companies has been highly volatile during the period of the COVID-19 pandemic. The COVID-19 pandemic continues to rapidly evolve, and the extent to which the pandemic may impact our business will depend on future developments, which are highly uncertain and cannot be predicted with confidence. 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.

Our stock price may fluctuate for many reasons, including as a result of public announcements regarding the progress of our development and commercialization efforts or the development and commercialization 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 and in September 2017, following our temporary suspension of dosing in our fitusiran program, our stock also declined, although to a lesser extent. 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.

For example, a class action complaint was filed on September 26, 2018 in the United States District Court for the Southern District of New York. The complaint, as amended, or the Complaint, alleges that we and our Chief Executive Officer, former Chief Financial Officer and certain of our other executive officers violated certain federal securities laws, specifically under Sections 10(b) and 20(a) of the Exchange Act, and Rule 10b-5 promulgated thereunder. The plaintiff seeks unspecified damages on behalf of a purported class of purchasers of our common stock between September 20, 2017 and September 12, 2018. On March 23, 2020, the Court granted our motion and dismissed the Complaint without prejudice. Pursuant to a prior Order of the Court, on June 1, 2020, plaintiff filed a motion seeking leave to file a further amended complaint. That motion was fully briefed on June 22, 2020, and remains pending with the Court. We believe that the allegations contained in the now dismissed Complaint are without merit. However, whether or not the plaintiff's claims are successful, this type of litigation is often expensive and diverts management's attention and resources, which could adversely affect the operation of our business. If we are ultimately required to pay significant defense costs, damages or settlement amounts, in excess of our insurance coverage, such payments could adversely affect our operations.

We may be the target of similar litigation in the future. For example, on September 12, 2019, the Chester County Employees Retirement Fund, individually and on behalf of all others similarly situated, filed a purported securities class action complaint alleging violation of federal securities laws against us, certain of our current and former directors and officers, and the underwriters of our November 14, 2017 public stock offering, in the Supreme Court of the State of New York, New York County, or the New York State Securities Litigation. We believe the allegations in the New York State Securities Litigation, like those in the Complaint described above, are without merit and if our motion to dismiss the case is not successful, we intend to defend the case vigorously. This litigation and future litigation could result in substantial costs and divert our management's attention and resources, which could cause serious harm to our business, operating results and financial condition. We maintain liability insurance; however, if any costs or expenses associated with this or any other litigation exceed our insurance coverage, we may be forced to bear some or all of these costs and expenses directly, which could be substantial.

Future sales of shares of our common stock, including by our significant stockholders, us or our directors and officers, could cause the price of our common stock to decline.

A small number of our stockholders beneficially own a substantial amount of our common stock. As of September 30, 2020, our six largest stockholders beneficially owned in excess of 50% of our outstanding shares of common stock. If our significant stockholders, or we or our officers and directors, sell substantial amounts of our common stock in the public market, or there is a perception that such sales may occur, the market price of our common stock could be adversely affected. Sales of common stock by our significant stockholders might make it more difficult for us to raise funds by selling equity or equity-related securities in the future at a time and price that we deem appropriate.

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

As of May 21, 2019, the closing date of the stock purchase in connection with the 2019 Regeneron collaboration, Regeneron held approximately 4% of our outstanding common stock and has the right to increase its ownership up to 30%. This concentration of ownership could harm the market price of our common stock in the future 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% 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% 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 5. OTHER INFORMATION

Second Amended and Restated Bylaws

On November 2, 2020, our board of directors approved our Second Amended and Restated Bylaws, or Bylaws. Section 5.9 of the Bylaws was amended to (i) make clarifying changes to the provision providing that the Court of Chancery of the State of Delaware shall be the exclusive forum for certain state law claims, and (ii) designate the federal district courts of the United States of America as the sole and exclusive forum for any litigation arising under the Securities Act of 1933, as amended.

The foregoing description is not complete and is qualified in its entirety by reference to the full text of the Bylaws, including Section 5.9 thereof, which is included as a part of Exhibit 3.1 filed with this Quarterly Report and incorporated herein by reference.

Amendment to CEO Change in Control Agreement

On November 2, 2020, we and our Chief Executive Officer, John Maraganore, entered into an amendment to the existing Change in Control Agreement, or CIC Agreement, between the Company and Dr. Maraganore. The CIC Agreement, as amended, provides an increase in potential cash severance payable thereunder from 1.5 to 2 times the sum of his annual base salary and his target annual cash bonus and an increase from 18 months to 24 months COBRA premiums.

The foregoing description of the CIC Agreement, as amended, is not complete and is qualified in its entirety by reference to the full text of the CIC Agreement, as amended, which the Company intends to file as an exhibit to its Annual Report on Form 10-K for the fiscal year ending December 31, 2020.

ITEM 6. EXHIBITS.

3.1#	Second Amended and Restated Bylaws of the Registrant.
10.1*#†	Co-Development Agreement between the Registrant and BXLS V Bodyguard – PCP L.P. and BXLS Family Investment Partnership V – ESC L.P. dated August 15, 2020.
10.2*#	First Amendment to Credit Agreement by and among the Registrant, as Borrower, the Guarantors from time to time party thereto, the Lenders from time to time party thereto, and Wilmington Trust, National Association, as Administrative Agent dated August 15, 2020.
10.3#	First Amendment to Lease entered into between the Registrant and RREEF America REIT II CORP. PPP dated September 30, 2020.
10.4#	Letter Agreement between the Registrant and Barry E. Greene dated August 26, 2020.
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.SCH	Inline XBRL Taxonomy Extension Schema Document
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document
104	Cover Page Interactive Data File (formatted as inline XBRL with applicable taxonomy extension information contained in Exhibits 101.*)
*	Schedules, exhibits and similar supporting attachments or agreements to this exhibit are omitted pursuant to Item 601(b)(2) of Regulation S-K. The Registrant agrees to furnish a supplemental copy of any omitted schedule or similar attachment to the Securities and Exchange Commission upon request.
#	Filed herewith.
†	Portions of this exhibit (indicated by asterisks) have been omitted in accordance with the rules of the Securities and Exchange Commission.

SIGNATURES

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: November 5, 2020

/s/ John M. Maraganore

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

Date: November 5, 2020

/s/ Jeffrey V. Poulton

Jeffrey V. Poulton
Executive Vice President, Chief Financial Officer
(Principal Financial and Accounting Officer)

SECOND AMENDED AND RESTATED
BYLAWS
OF
ALNYLAM PHARMACEUTICALS, INC.
(formerly Alnylam Holding Co.)

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ARTICLE I

STOCKHOLDERS

1.1 Place of Meetings. All meetings of stockholders shall be held at such place as may be designated from time to time by the Board of Directors, the Chairman of the Board or the Chief Executive Officer or, if not so designated, at the principal office of the corporation. The Board may, in its sole discretion, determine that a meeting of stockholders shall not be held at any place, but may instead be held solely by means of remote communication in the manner authorized by the General Corporation Law of the State of Delaware.

1.2 Annual Meeting. The annual meeting of stockholders for the election of directors and for the transaction of such other business as may properly be brought before the meeting shall be held on a date and at a time designated by the Board of Directors, the Chairman of the Board, the Chief Executive Officer or the President (if the President shall be a different individual than the Chief Executive Officer) (which date shall not be a legal holiday in the place where the meeting is to be held). If no annual meeting is held in accordance with the foregoing provisions, a special meeting may be held in lieu of the annual meeting, and any action taken at that special meeting shall have the same effect as if it had been taken at the annual meeting, and in such case all references in these Bylaws to the annual meeting of the stockholders shall be deemed to refer to such special meeting.

1.3 Special Meetings

(a) Special meetings of stockholders may be called by the Board of Directors, the Chairman of the Board or the Chief Executive Officer.

(b) A special meeting of stockholders shall be called by the Secretary at the written request or requests (each, a “Special Meeting Request” and, collectively, the “Special Meeting Requests”) of holders of record who own, or are validly acting on behalf of one or more beneficial owners who own, “Net Long Shares” (as calculated in accordance with Section 1.3(f)) that represent more than fifty percent (50%) of the votes which all the stockholders of the corporation would be entitled to cast in any annual election of directors or class of directors (the “Special Meeting Requisite Percentage”) and who continue to own the Special Meeting Requisite Percentage at all times between the date of the Special Meeting Request through the date of the applicable special meeting of stockholders. A beneficial owner who wishes to deliver a Special Meeting Request must cause the nominee or other person who serves as the stockholder of record of such beneficial owner’s stock to sign the Special Meeting Request. If a stockholder of record is the nominee for more than one beneficial owner of stock, the stockholder of record may deliver the Special Meeting Request to call a special meeting solely with respect to the capital stock of the corporation beneficially owned by the beneficial owner who is directing the stockholder of record to sign such Special Meeting Request.

(c) A Special Meeting Request to the Secretary shall be signed and dated by each stockholder of record (whether acting for him, her or itself, or at the direction of a beneficial owner) requesting the special meeting (each, a “Requesting Stockholder”), shall comply with this Section 1.3 and Section 1.10, and shall include (i) a statement of the specific purpose or purposes of the special

meeting and the exact and complete text of any proposal, (ii) the information required by the second paragraph of Section 1.10(b) and the second paragraph of Section 1.11(b) (as if such notice were submitted in connection with an annual meeting), as applicable, including any information pertaining to the stockholder which shall include such information with respect to both the beneficial owner, if any, directing such stockholder of record to sign the Special Meeting Request and to such stockholder of record (unless such stockholder of record is acting solely as a nominee for a beneficial owner) (each such beneficial owner and each stockholder of record who is not acting solely as a nominee, a “Disclosing Party”), (iii) an acknowledgement that a disposition of Net Long Shares of the corporation’s capital stock owned of record or beneficially as of the date on which the Special Meeting Request in respect of such Net Long Shares is delivered to the Secretary that is made at any time prior to the special meeting shall constitute a revocation of such Special Meeting Request with respect to such disposed Net Long Shares, (iv) documentary evidence that the Disclosing Parties own the Special Meeting Requisite Percentage as of the date of such written request to the Secretary, (v) documentary evidence that the Requesting Stockholder has full power and authority to act on behalf of all beneficial owners it purports to act for, and (vi) with respect to each business proposal to be submitted for stockholder approval at the special meeting, a statement whether or not any Disclosing Party will deliver a proxy statement and form of proxy to holders of at least the percentage of voting power of all of the shares of capital stock of the corporation required to carry such proposal (such statement, a “Solicitation Statement”). Each time the Disclosing Party’s ownership position decreases following the delivery of the foregoing information to the Secretary, such Disclosing Party shall notify the corporation of his, her or its decreased ownership position, together with any information reasonably requested by the Board of Directors to verify such position, within 3 days of such decrease or as of the 5th day before the special meeting, whichever is earlier. In addition, the Requesting Stockholders and Disclosing Parties shall promptly provide any other information reasonably requested by the corporation.

(d) Notwithstanding the foregoing provisions of this Section 1.3, a special meeting requested by stockholders shall not be held if (i) the Special Meeting Request does not comply with this Section 1.3, (ii) the Special Meeting Request relates to an item of business that is not a proper subject for stockholder action under applicable law, (iii) the Special Meeting Request is received by the corporation during the period commencing one hundred twenty (120) days prior to the first anniversary of the date of the immediately preceding annual meeting and ending on the date of the next annual meeting, (iv) an annual or special meeting of stockholders that included an identical or substantially similar item of business (“Similar Business”), as determined by the Board of Directors, was held not more than one hundred twenty (120) days before the Special Meeting Request was received by the Secretary, (v) the Board of Directors has called or calls for an annual or special meeting of stockholders to be held within ninety (90) days after the Special Meeting Request is received by the Secretary and the business to be conducted at such meeting is determined by the Board of Directors to include the Similar Business, or (vi) the Special Meeting Request was made in a manner that involved a violation of Regulation 14A under the Exchange Act or other applicable law. For purposes of this Section 1.3(d), the nomination, election or removal of directors shall be deemed to be Similar Business with respect to all items of business involving the nomination, election or removal of directors, changing the size of the Board of Directors and filling of vacancies and/or newly created directorships resulting from any increase in the authorized number of directors. The Board of Directors shall determine whether the requirements set forth in this Section 1.3(d) have been satisfied.

(e) In determining whether a special meeting of stockholders has been requested by the record holders representing in the aggregate at least the Special Meeting Requisite Percentage, multiple Special Meeting Requests delivered to the Secretary will be considered together only if (i) each Special Meeting Request identifies substantially the same purpose or purposes of the special meeting and substantially the same matters proposed to be acted on at the special meeting (in each case as determined by the Board of Directors), and (ii) such Special Meeting Requests have been dated and delivered to the Secretary within sixty (60) days of the earliest dated Special Meeting Request. A Requesting Stockholder may revoke a Special Meeting Request at any time by written revocation delivered to the Secretary and if, following such revocation, there are outstanding un-revoked requests from Requesting Stockholders holding less than the Special Meeting Requisite Percentage, the Board of Directors may, in its discretion, cancel the special meeting or, if a special meeting has not yet been called, not call a special meeting. A Special Meeting Request shall be deemed to be revoked: (w) upon the first date that the aggregate ownership position of all the Disclosing Parties who are listed on the unrevoked Special Meeting Request decreases to a number of shares of capital stock of the corporation less than the Special Meeting Requisite Percentage; (x) if any Disclosing Party does not act in accordance with the representations set forth in the Solicitation Statement delivered by such Disclosing Party or any representations made pursuant to these Bylaws; or (y) if the Requesting Stockholder or the Disclosing Party does not comply with this Section 1.3. If an actual or deemed revocation of a valid Special Meeting Request has occurred after the special meeting has been called by the Secretary, the Board of Directors shall have the discretion to determine whether or not to proceed with the special meeting.

(f) For purposes of this Section 1.3 and for determining the Special Meeting Requisite Percentage, “Net Long Shares” shall mean the number of shares beneficially owned, directly or indirectly, by any Requesting Stockholder or its affiliates that constitute such person’s net long position as defined in Rule 14e-4 under the Exchange Act, (provided that for purposes of such definition the date the tender offer is first announced shall instead be the date for determining a Requesting Stockholder’s Net Long Shares and the reference to the highest tender price shall refer to the market price on such date) and, to the extent not covered by such definition, reduced by any shares (i) as to which such person does not have the full economic rights (including the opportunity for profit and the risk of loss), investment rights and voting rights (including the right to vote or direct the vote at the special meeting) or (ii) as to which such person has entered into any option, warrant, forward contract, swap, contract of sale, other derivative or similar agreement, arrangement or understanding that hedges or transfers, in whole or in part, directly or indirectly, any of the economic consequences of ownership of such shares. In addition, to the extent any affiliates of the stockholder are acting in concert with the stockholder with respect to the calling of the special meeting, the determination of Net Long Shares may include the effect of aggregating the Net Long Shares (including any negative number) of such affiliate or affiliates. Whether shares constitute “Net Long Shares” shall be decided by the Board of Directors.

(g) Business transacted at all special meetings of stockholders shall be limited to the matters set forth in the corporation’s notice of special meeting. Nothing contained herein shall prohibit the Board of Directors from submitting matters to the stockholders at any special meeting requested by stockholders.

(h) The chairman of any meeting shall, if the facts warrant, have the power and duty to determine that business was not properly brought before the meeting in accordance with the provisions of this Section 1.3 (including whether the stockholder solicited (or is part of a group which solicited) or did not so solicit, as the case may be, proxies in support of such stockholder's proposal in compliance with the representation with respect thereto required by this Section 1.3), and if the chairman should so determine, the chairman shall so declare to the meeting and such business shall not be brought before the meeting.

(i) Notwithstanding the foregoing provisions of this Section 1.3, if the stockholder (or a qualified representative of the stockholder) does not appear at the special meeting of stockholders of the corporation to present business, such business shall not be transacted, notwithstanding that proxies in respect of such vote may have been received by the corporation. For purposes of this Section 1.3, to be considered a qualified representative of the stockholder, a person must be authorized by a writing executed by such stockholder or an electronic transmission delivered by such stockholder to act for such stockholder as proxy at the meeting of stockholders and such person must produce such writing or electronic transmission, or a reliable reproduction of the writing or electronic transmission, at the meeting of stockholders.

(j) Special meetings shall be held at such date and time as may be fixed by the Board of Directors in accordance with these Bylaws; *provided, however*, that in the case of a special meeting requested by stockholders, the date of any such special meeting shall not be more than ninety (90) days after a Special Meeting Request that satisfies the requirements of this Section 1.3 is received by the Secretary. Special meetings shall be held at such place within or without the State of Delaware as is specified in the notice of meeting.

1.4 Notice of Meetings. Except as otherwise provided by law, notice of each meeting of stockholders, whether annual or special, shall be given not less than 10 nor more than 60 days before the date of the meeting to each stockholder entitled to vote at such meeting. Without limiting the manner by which notice otherwise may be given to stockholders, any notice shall be effective if given by a form of electronic transmission consented to (in a manner consistent with the General Corporation Law of the State of Delaware) by the stockholder to whom the notice is given. The notices of all meetings shall state the place, date and time of the meeting and the means of remote communications, if any, by which stockholders and proxyholders may be deemed to be present in person and vote at such meeting. The notice of a special meeting shall state, in addition, the purpose or purposes for which the meeting is called. If notice is given by mail, such notice shall be deemed given when deposited in the United States mail, postage prepaid, directed to the stockholder at such stockholder's address as it appears on the records of the corporation. If notice is given by electronic transmission, such notice shall be deemed given at the time specified in Section 232 of the General Corporation Law of the State of Delaware.

1.5 Voting List. The Secretary shall prepare, at least 10 days before every meeting of stockholders, a complete list of the stockholders entitled to vote at the meeting, arranged in alphabetical order, and showing the address of each stockholder and the number of shares registered in the name of each stockholder. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting, for a period of at least 10 days prior to the meeting: (i) on a reasonably accessible electronic network, provided that the information required

to gain access to such list is provided with notice of the meeting, or (ii) during ordinary business hours, at the principal place of business of the corporation. The list shall also be produced and kept at the time and place of the meeting during the whole time thereof, and may be inspected by any stockholder who is present.

1.6 Quorum. Except as otherwise provided by law, the Certificate of Incorporation or these Bylaws, the holders of a majority in voting power of the shares of the capital stock of the corporation issued and outstanding and entitled to vote at the meeting, present in person, present by means of remote communication in a manner, if any, authorized by the Board of Directors in its sole discretion, or represented by proxy, shall constitute a quorum for the transaction of business. A quorum, once established at a meeting, shall not be broken by the withdrawal of enough votes to leave less than a quorum.

1.7 Adjournments. Any meeting of stockholders may be adjourned from time to time to any other time and to any other place at which a meeting of stockholders may be held under these Bylaws by the stockholders present or represented at the meeting and entitled to vote, although less than a quorum, or, if no stockholder is present, by any officer entitled to preside at or to act as secretary of such meeting. It shall not be necessary to notify any stockholder of any adjournment of less than 30 days if the time and place of the adjourned meeting, and the means of remote communication, if any, by which stockholders and proxyholders may be deemed to be present in person and vote at such adjourned meeting, are announced at the meeting at which adjournment is taken, unless after the adjournment a new record date is fixed for the adjourned meeting. At the adjourned meeting, the corporation may transact any business which might have been transacted at the original meeting.

1.8 Voting and Proxies. Each stockholder shall have one vote for each share of stock entitled to vote held of record by such stockholder and a proportionate vote for each fractional share so held, unless otherwise provided by law or the Certificate of Incorporation. Each stockholder of record entitled to vote at a meeting of stockholders may vote in person (including by means of remote communications, if any, by which stockholders may be deemed to be present in person and vote at such meeting) or may authorize another person or persons to vote for such stockholder by a proxy executed or transmitted in a manner permitted by the General Corporation Law of the State of Delaware by the stockholder or such stockholder's authorized agent and delivered (including by electronic transmission) to the Secretary of the corporation. No such proxy shall be voted upon after three years from the date of its execution, unless the proxy expressly provides for a longer period.

1.9 Action at Meeting. When a quorum is present at any meeting, any matter other than the election of directors to be voted upon by the stockholders at such meeting shall be decided by the affirmative vote of the holders of a majority in voting power of the outstanding shares of stock present or represented and voting on such matter (or if there are two or more classes of stock entitled to vote as separate classes, then in the case of each such class, the holders of a majority of the stock of that class present or represented and voting on such matter), except when a different vote is required by law, applicable rule, regulation or listing agreement, the Certificate of Incorporation or these Bylaws. When a quorum is present at any meeting, a nominee for director shall be elected to the Board of Directors if the votes cast for such nominee's election exceed the

votes cast against such nominee's election; provided, however, that directors shall be elected by a plurality of votes cast at any meeting of stockholders at which there is a contested election of directors. An election shall be considered contested if as of the record date of any meeting of stockholders there are more nominees for election than positions on the Board of Directors to be filled by election at that meeting.

1.10 Nomination of Directors.

(a) Except for (i) any directors entitled to be elected by the holders of preferred stock, (ii) any directors elected in accordance with Section 2.8 hereof by the Board of Directors to fill a vacancy or newly created directorships, or (iii) as otherwise required by applicable law or stock market regulation, only persons who are nominated in accordance with the procedures in this Section 1.10 shall be eligible for election as directors. Nominations for election to the Board of Directors of the corporation at an annual meeting of stockholders may be made (i) by or at the direction of the Board of Directors or (ii) by any stockholder who (x) complies with the notice procedures set forth in Section 1.10(b), and (y) is a stockholder of record on the date of the giving of such notice and on the record date for the determination of stockholders entitled to vote at such meeting. Nominations for election to the Board of Directors of the corporation at a special meeting at which directors are to be elected pursuant to the corporation's notice of meeting may be made (i) by or at the direction of the Board of Directors, (ii) by stockholders pursuant to Section 1.3(c) hereof, or (iii) provided that the Board of Directors or stockholders pursuant to Section 1.3 have validly called a special meeting and directors are to be elected at such meeting, by any stockholder who (x) complies with the notice procedures set forth in Section 1.10(b), and (y) is a stockholder of record on the date of the giving of such notice and on the record date for the determination of stockholders entitled to vote at such meeting. The proposal of other business to be conducted at a special meeting of stockholders may only be made in accordance with Section 1.3.

(b) To be timely, a stockholder's notice must be received in writing by the Secretary at the principal executive offices of the corporation as follows: (x) in the case of an election of directors at an annual meeting of stockholders, not less than 90 days nor more than 120 days prior to the first anniversary of the preceding year's annual meeting; *provided, however*, that in the event that the date of the annual meeting is advanced by more than 20 days, or delayed by more than 60 days, from the first anniversary of the preceding year's annual meeting, a stockholder's notice must be so received not earlier than the 120th day prior to such annual meeting and not later than the close of business on the later of (A) the 90th day prior to such annual meeting and (B) the tenth day following the day on which notice of the date of such annual meeting was mailed or public disclosure of the date of such annual meeting was made, whichever first occurs; or (y) in the case of a special meeting of stockholders at which directors are to be elected pursuant to the corporation's notice of meeting, not earlier than the 120th day prior to such special meeting and not later than the close of business on the later of (i) the 90th day prior to such special meeting and (ii) the tenth day following the day on which notice of the date of such special meeting was mailed or public disclosure of the date of such special meeting was made, whichever first occurs.

The stockholder's notice to the Secretary shall set forth: (a) as to each proposed nominee (i) such person's name, age, business address and, if known, residence address, (ii) such person's principal occupation or employment, (iii) the class and number of shares of stock of the corporation which

are beneficially owned by such person, and (iv) any other information concerning such person that must be disclosed as to nominees in proxy solicitations pursuant to Regulation 14A under the Securities Exchange Act of 1934, as amended (the “Exchange Act”); (b) as to the stockholder giving the notice (i) such stockholder’s name and address, as they appear on the corporation’s books, (ii) the class and number of shares of stock of the corporation which are owned, beneficially and of record, by such stockholder, (iii) a description of all arrangements or understandings between such stockholder and each proposed nominee and any other person or persons (including their names) pursuant to which the nomination(s) are to be made by such stockholder, (iv) a representation that such stockholder intends to appear in person or by proxy at the meeting to nominate the person(s) named in its notice and (v) a representation whether the stockholder intends or is part of a group which intends (a) to deliver a proxy statement and/or form of proxy to holders of at least the percentage of the corporation’s outstanding capital stock required to elect the nominee and/or (b) otherwise to solicit proxies from stockholders in support of such nomination; and (c) as to the beneficial owner, if any, on whose behalf the nomination is being made (i) such beneficial owner’s name and address, (ii) the class and number of shares of stock of the corporation which are beneficially owned by such beneficial owner, (iii) a description of all arrangements or understandings between such beneficial owner and each proposed nominee and any other person or persons (including their names) pursuant to which the nomination(s) are to be made and (iv) a representation whether the beneficial owner intends or is part of a group which intends (a) to deliver a proxy statement and/or form of proxy to holders of at least the percentage of the corporation’s outstanding capital stock requirement to elect the nominee and/or (b) otherwise to solicit proxies from stockholders in support of such nomination. In addition, to be effective, the stockholder’s notice must be accompanied by the written consent of the proposed nominee to serve as a director if elected. The corporation may require any proposed nominee to furnish such other information as may reasonably be required to determine the eligibility of such proposed nominee to serve as a director of the corporation. A stockholder shall not have complied with this Section 1.10(b) if the stockholder or beneficial owner, if any, on whose behalf the nomination is made solicited (or is part of a group which solicited) or did not so solicit, as the case may be, proxies in support of such stockholder’s nominee in compliance with the representations with respect thereto required by this Section 1.10.

(c) The chairman of any meeting shall, if the facts warrant, have the power and duty to determine that a nomination was not made in accordance with the provisions of this Section 1.10 (including whether the stockholder or beneficial owner, if any, on whose behalf the nomination is made solicited (or is part of a group which solicited) or did not so solicit, as the case may be, proxies in support of such stockholder’s nominee in compliance with the representations with respect thereto required by this Section 1.10), and if the chairman should so determine, the chairman shall so declare to the meeting and such nomination shall be disregarded.

(d) Except as otherwise required by law, nothing in this Section 1.10 shall obligate the corporation or the Board of Directors to include in any proxy statement or other stockholder communication distributed on behalf of the corporation or the Board of Directors information with respect to any nominee for director submitted by a stockholder.

(e) Notwithstanding the foregoing provisions of this Section 1.10, if the stockholder (or a qualified representative of the stockholder) does not appear at the annual or special meeting of

stockholders of the corporation to present a nomination, such nomination shall be disregarded, notwithstanding that proxies in respect of such vote may have been received by the corporation. For purposes of this Section 1.10, to be considered a qualified representative of the stockholder, a person must be authorized by a writing executed by such stockholder or an electronic transmission delivered by such stockholder to act for such stockholder as proxy at the meeting of stockholders and such person must produce such writing or electronic transmission, or a reliable reproduction of the writing or electronic transmission, at the meeting of stockholders.

(f) For purposes of this Section 1.10, “public disclosure” shall include disclosure in a press release reported by the Dow Jones News Service, Associated Press or comparable national news service or in a document publicly filed by the Corporation with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the Exchange Act.

1.11 Notice of Business at Annual Meetings.

(a) At any annual meeting of the stockholders, only such business shall be conducted as shall have been properly brought before the meeting. To be properly brought before an annual meeting, business must be (i) specified in the notice of meeting (or any supplement thereto) given by or at the direction of the Board of Directors, (ii) otherwise properly brought before the meeting by or at the direction of the Board of Directors, or (iii) properly brought before the meeting by a stockholder. For business to be properly brought before an annual meeting by a stockholder, (i) if such business relates to the nomination of a person for election as a director of the corporation, the procedures in Section 1.10 must be complied with and (ii) if such business relates to any other matter, the business must constitute a proper matter for stockholder action and the stockholder must (x) have given timely notice thereof in writing to the Secretary in accordance with the procedures set forth in Section 1.11(b) and (y) be a stockholder of record on the date of the giving of such notice and on the record date for the determination of stockholders entitled to vote at such annual meeting.

(b) To be timely, a stockholder’s notice must be received in writing by the Secretary at the principal executive offices of the corporation not less than 90 days nor more than 120 days prior to the first anniversary of the preceding year’s annual meeting; provided, however, that in the event that the date of the annual meeting is advanced by more than 20 days, or delayed by more than 60 days, from the first anniversary of the preceding year’s annual meeting, a stockholder’s notice must be so received not earlier than the 120th day prior to such annual meeting and not later than the close of business on the later of (A) the 90th day prior to such annual meeting and (B) the tenth day following the day on which notice of the date of such annual meeting was mailed or public disclosure of the date of such annual meeting was made, whichever first occurs. In no event shall the adjournment or postponement of an annual meeting (or the public announcement thereof) commence a new time (or extend any time period) for the giving of a stockholder’s notice.

The stockholder’s notice to the Secretary shall set forth as to each matter the stockholder proposes to bring before the annual meeting (i) a brief description of the business desired to be brought before the annual meeting, the text of the proposal or business (including the text of any resolutions proposed for consideration and in the event that such business includes a proposal to amend these By-laws, the language of the proposed amendment), and the reasons for conducting such business

at the annual meeting, (ii) the name and address, as they appear on the corporation's books, of the stockholder proposing such business, and the name and address of the beneficial owner, if any, on whose behalf the proposal is made, (iii) the class and number of shares of stock of the corporation which are owned, of record and beneficially, by the stockholder and beneficial owner, if any, (iv) a description of all arrangements or understandings between such stockholder or such beneficial owner, if any, and any other person or persons (including their names) in connection with the proposal of such business by such stockholder and any material interest of the stockholder or such beneficial owner, if any, in such business, (v) a representation that such stockholder intends to appear in person or by proxy at the annual meeting to bring such business before the meeting and (vi) a representation whether the stockholder or the beneficial owner, if any, intends or is part of a group which intends (a) to deliver a proxy statement and/or form of proxy to holders of at least the percentage of the corporation's outstanding capital stock required to approve or adopt the proposal and/or (b) otherwise to solicit proxies from stockholders in support of such proposal. Notwithstanding anything in these Bylaws to the contrary, no business shall be conducted at any annual meeting of stockholders except in accordance with the procedures set forth in this Section 1.11; provided that any stockholder proposal which complies with Rule 14a-8 of the proxy rules (or any successor provision) promulgated under the Securities Exchange Act of 1934, as amended, and is to be included in the corporation's proxy statement for an annual meeting of stockholders shall be deemed to comply with the requirements of this Section 1.11. A stockholder shall not have complied with this Section 1.11(b) if the stockholder or beneficial owner, if any, on whose behalf the nomination is made solicited (or is part of a group which solicited) or did not so solicit, as the case may be, proxies in support of such stockholder's nominee in compliance with the representations with respect thereto required by this Section 1.11.

(c) The chairman of any meeting shall, if the facts warrant, have the power and duty to determine that business was not properly brought before the meeting in accordance with the provisions of this Section 1.11 (including whether the stockholder or beneficial owner, if any, on whose behalf the proposal is made solicited (or is part of a group which solicited) or did not so solicit, as the case may be, proxies in support of such stockholder's proposal in compliance with the representation with respect thereto required by this Section 1.11), and if the chairman should so determine, the chairman shall so declare to the meeting and such business shall not be brought before the meeting.

(d) Notwithstanding the foregoing provisions of this Section 1.11, if the stockholder (or a qualified representative of the stockholder) does not appear at the annual meeting of stockholders of the corporation to present business, such business shall not be transacted, notwithstanding that proxies in respect of such vote may have been received by the corporation. For purposes of this Section 1.11, to be considered a qualified representative of the stockholder, a person must be authorized by a writing executed by such stockholder or an electronic transmission delivered by such stockholder to act for such stockholder as proxy at the meeting of stockholders and such person must produce such writing or electronic transmission, or a reliable reproduction of the writing or electronic transmission, at the meeting of stockholders.

(e) For purposes of this Section 1.11, "public disclosure" shall include disclosure in a press release reported by the Dow Jones News Service, Associated Press or comparable national news

service or in a document publicly filed by the corporation with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the Exchange Act.

1.12 Conduct of Meetings.

(a) Meetings of stockholders shall be presided over by the Chairman of the Board, if any, or in the Chairman's absence by the Vice Chairman of the Board, if any, or in the Vice Chairman's absence by the Chief Executive Officer, or in the Chief Executive Officer's absence by the President (if the President shall be a different individual than the Chief Executive Officer), or in the President's absence by a Vice President, or in the absence of all of the foregoing persons by a chairman designated by the Board of Directors, or in the absence of such designation by a chairman chosen by vote of the stockholders at the meeting. The Secretary shall act as secretary of the meeting, but in the Secretary's absence the chairman of the meeting may appoint any person to act as secretary of the meeting.

(b) The Board of Directors of the corporation may adopt by resolution such rules, regulations and procedures for the conduct of any meeting of stockholders of the corporation as it shall deem appropriate including, without limitation, such guidelines and procedures as it may deem appropriate regarding the participation by means of remote communication of stockholders and proxyholders not physically present at a meeting. Except to the extent inconsistent with such rules, regulations and procedures as adopted by the Board of Directors, the chairman of any meeting of stockholders shall have the right and authority to prescribe such rules, regulations and procedures and to do all such acts as, in the judgment of such chairman, are appropriate for the proper conduct of the meeting. Such rules, regulations or procedures, whether adopted by the Board of Directors or prescribed by the chairman of the meeting, may include, without limitation, the following: (i) the establishment of an agenda or order of business for the meeting; (ii) rules and procedures for maintaining order at the meeting and the safety of those present; (iii) limitations on attendance at or participation in the meeting to stockholders of record of the corporation, their duly authorized and constituted proxies or such other persons as shall be determined; (iv) restrictions on entry to the meeting after the time fixed for the commencement thereof; and (v) limitations on the time allotted to questions or comments by participants. Unless and to the extent determined by the Board of Directors or the chairman of the meeting, meetings of stockholders shall not be required to be held in accordance with the rules of parliamentary procedure.

(c) The chairman of the meeting shall announce at the meeting when the polls for each matter to be voted upon at the meeting will be opened and closed. If no announcement is made, the polls shall be deemed to have opened when the meeting is convened and closed upon the final adjournment of the meeting. After the polls close, no ballots, proxies or votes or any revocations or changes thereto may be accepted.

(d) In advance of any meeting of stockholders, the Board of Directors, the Chairman of the Board, the Chief Executive Officer or the President (if the President shall be a different individual than the Chief Executive Officer) shall appoint one or more inspectors or election to act at the meeting and make a written report thereof. One or more other persons may be designated as alternate inspectors to replace any inspector who fails to act. If no inspector or alternate is present, ready and willing to act at a meeting of stockholders, the chairman of the meeting shall appoint one

or more inspectors to act at the meeting. Unless otherwise required by law, inspectors may be officers, employees or agents of the corporation. Each inspector, before entering upon the discharge of such inspector's duties, shall take and sign an oath faithfully to execute the duties of inspector with strict impartiality and according to the best of such inspector's ability. The inspector shall have the duties prescribed by law and shall take charge of the polls and, when the vote is completed, shall make a certificate of the result of the vote taken and of such other facts as may be required by law.

1.13 No Action by Consent in Lieu of a Meeting. Stockholders of the corporation may not take any action by written consent in lieu of a meeting.

ARTICLE II

DIRECTORS

2.1 General Powers. The business and affairs of the corporation shall be managed by or under the direction of a Board of Directors, who may exercise all of the powers of the corporation except as otherwise provided by law or the Certificate of Incorporation.

2.2 Number, Election and Qualification. Subject to the rights of holders of any series of Preferred Stock to elect directors, the number of directors of the Corporation shall be established by the Board of Directors. Election of Directors need not be by written ballot. Directors need not be stockholders of the corporation.

2.3 Classes of Directors. Subject to the rights of holders of any series of Preferred Stock to elect directors, the Board of Directors shall be and is divided into three classes: Class I, Class II and Class III.

2.4 Terms of Office. Subject to the rights of holders of any series of Preferred Stock to elect directors, each director shall serve for a term ending on the date of the third annual meeting following the annual meeting at which such director was elected; provided, that each director initially appointed to Class I shall serve for a term expiring at the corporation's annual meeting of stockholders held in 2005; each director initially appointed to Class II shall serve for a term expiring at the corporation's annual meeting of stockholders held in 2006; and each director initially appointed to Class III shall serve for a term expiring at the corporation's annual meeting of stockholders held in 2007; provided further, that the term of each director shall continue until the election and qualification of a successor and be subject to such director's earlier death, resignation or removal.

2.5 Quorum. The greater of (a) a majority of the directors at any time in office and (b) one-third of the number of directors fixed by the Board of Directors shall constitute a quorum for the transaction of business. If at any meeting of the Board of Directors there shall be less than such a quorum, a majority of the directors present may adjourn the meeting from time to time without further notice other than announcement at the meeting, until a quorum shall be present.

2.6 Action at Meeting. Every act or decision done or made by a majority of the directors present at a meeting duly held at which a quorum is present shall be regarded as the act of the

Board of Directors unless a greater number is required by law or by the Certificate of Incorporation.

2.7 Removal. Subject to the rights of holder of any series of Preferred Stock, directors of the corporation may be removed only for cause and only by the affirmative vote of the holders of at least seventy-five percent (75%) of the votes which all the stockholders would be entitled to cast in any annual election of directors or class of directors.

2.8 Vacancies. Subject to the rights of holder of any series of Preferred Stock, any vacancy or newly created directorships on the Board of Directors, however occurring, shall be filled only by vote of a majority of the directors then in office, although less than a quorum, or by a sole remaining director and shall not be filled by the stockholders. A director elected to fill a vacancy shall hold office until the next election of the class for which such director shall have been chosen, subject to the election and qualification of a successor or until such director's earlier death, resignation or removal.

2.9 Resignation. Any director may resign by delivering a resignation in writing or by electronic transmission to the corporation at its principal office or to the Chairman of the Board, the Chief Executive Officer, the President (if the President shall be a different individual than the Chief Executive Officer) or the Secretary. Such resignation shall be effective upon receipt unless it is specified to be effective at some later time or upon the happening of some later event.

2.10 Regular Meetings. Regular meetings of the Board of Directors may be held without notice at such time and place as shall be determined from time to time by the Board of Directors; provided that any director who is absent when such a determination is made shall be given notice of the determination. A regular meeting of the Board of Directors may be held without notice immediately after and at the same place as the annual meeting of stockholders.

2.11 Special Meetings. Special meetings of the Board of Directors may be held at any time and place designated in a call by the Chairman of the Board, the Chief Executive Officer, two or more directors, or by one director in the event that there is only a single director in office.

2.12 Notice of Special Meetings. Notice of any special meeting of directors shall be given to each director by the Secretary or by the officer or one of the directors calling the meeting. Notice shall be duly given to each director (i) in person or by telephone or electronic mail at least 24 hours in advance of the meeting, (ii) by sending a telegram or telecopy or delivering written notice by hand, to such director's last known business, home or electronic mail address at least 48 hours in advance of the meeting, or (iii) by sending written notice, via first-class mail or reputable overnight courier, to such director's last known business or home address at least 72 hours in advance of the meeting. A notice or waiver of notice of a meeting of the Board of Directors need not specify the purposes of the meeting.

2.13 Meetings by Conference Communications Equipment. Directors may participate in meetings of the Board of Directors or any committee thereof by means of conference telephone or other communications equipment by means of which all persons participating in the meeting can hear each other, and participation by such means shall constitute presence in person at such meeting.

2.14 Action by Consent. Any action required or permitted to be taken at any meeting of the Board of Directors or of any committee thereof may be taken without a meeting, if all members of the Board of Directors or committee, as the case may be, consent to the action in writing or by electronic transmission, and the written consents or electronic transmissions are filed with the minutes of proceedings of the Board of Directors or committee.

2.15 Committees. The Board of Directors may designate one or more committees, each committee to consist of one or more of the directors of the corporation. The Board of Directors may designate one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee. In the absence or disqualification of a member of a committee, the member or members of the committee present at any meeting and not disqualified from voting, whether or not such member or members constitute a quorum, may unanimously appoint another member of the Board of Directors to act at the meeting in the place of any such absent or disqualified member. Any such committee, to the extent provided in the resolution of the Board of Directors and subject to the provisions of law, shall have and may exercise all the powers and authority of the Board of Directors in the management of the business and affairs of the corporation and may authorize the seal of the corporation to be affixed to all papers which may require it. Each such committee shall keep minutes and make such reports as the Board of Directors may from time to time request. Except as the Board of Directors may otherwise determine, any committee may make rules for the conduct of its business, but unless otherwise provided by the directors or in such rules, its business shall be conducted as nearly as possible in the same manner as is provided in these Bylaws for the Board of Directors.

2.16 Compensation of Directors. Directors may be paid such compensation for their services and such reimbursement for expenses of attendance at meetings as the Board of Directors may from time to time determine. No such payment shall preclude any director from serving the corporation or any of its parent or subsidiary entities in any other capacity and receiving compensation for such service.

ARTICLE III

OFFICERS

3.1 Titles. The officers of the corporation shall consist of a Chief Executive Officer, a President, a Secretary, a Treasurer and such other officers with such other titles as the Board of Directors may from time to time determine, including a Chairman of the Board, a Vice Chairman of the Board, a President and one or more Vice Presidents, Assistant Treasurers, and Assistant Secretaries. The Board of Directors may appoint such other officers as it may deem appropriate.

3.2 Election. The Chief Executive Officer, President, Treasurer and Secretary shall be elected annually by the Board of Directors at its first meeting following the annual meeting of stockholders. Other officers may be appointed by the Board of Directors at such meeting or at any other meeting.

3.3 Qualification. No officer need be a stockholder. Any two or more offices may be held by the same person.

3.4 Tenure. Except as otherwise provided by law, by the Certificate of Incorporation or by these Bylaws, each officer shall hold office until such officer's successor is elected and qualified, unless a different term is specified in the resolution electing or appointing such officer, or until such officer's earlier death, resignation or removal.

3.5 Resignation and Removal. Any officer may resign by delivering a written resignation to the corporation at its principal office or to the Chief Executive Officer or the Secretary. Such resignation shall be effective upon receipt unless it is specified to be effective at some later time or upon the happening of some later event.

Any officer may be removed at any time, with or without cause, by vote of a majority of the directors then in office.

Except as the Board of Directors may otherwise determine, no officer who resigns or is removed shall have any right to any compensation as an officer for any period following such officer's resignation or removal, or any right to damages on account of such removal, whether such officer's compensation be by the month or by the year or otherwise, unless such compensation is expressly provided in a duly authorized written agreement with the corporation.

3.6 Vacancies.

The Board of Directors may fill any vacancy occurring in any office for any reason and may, in its discretion, leave unfilled for such period as it may determine any offices other than those of Chief Executive Officer, Treasurer and Secretary. Each such successor shall hold office for the unexpired term of such officer's predecessor and until a successor is elected and qualified, or until such officer's earlier death, resignation or removal.

3.7 Chairman of the Board. The Board of Directors may appoint from its members a Chairman of the Board, who need not be an employee or officer of the corporation. If the Board of Directors appoints a Chairman of the Board, such Chairman shall perform such duties and possess such powers as are assigned by the Board of Directors and, if the Chairman of the Board is also designated as the corporation's Chief Executive Officer, shall have the powers and duties of the Chief Executive Officer prescribed in Section 3.8 of these Bylaws. Unless otherwise provided by the Board of Directors, the Chairman of the Board shall preside at all meetings of the Board of Directors and stockholders.

3.8 Chief Executive Officer. The Chief Executive Officer shall have general charge and supervision of the business of the Corporation subject to the direction of the Board of Directors. The Chief Executive Officer may, but need not, also be the President.

3.9 President. If the Chief Executive Officer is not also the President, the President shall perform such duties and shall have such powers as the Board of Directors or the Chief Executive Officer may from time to time prescribe.

3.10 Vice Presidents. Any Vice President shall perform such duties and possess such powers as the Board of Directors or the Chief Executive Officer may from time to time prescribe. In the event of the absence, inability or refusal to act of the Chief Executive Officer or the President (if the President is not the Chief Executive Officer), the Vice President (or if there shall be more than one,

the Vice Presidents in the order determined by the Board of Directors) shall perform the duties of the Chief Executive Officer and when so performing shall have all the powers of and be subject to all the restrictions upon the Chief Executive Officer. The Board of Directors may assign to any Vice President the title of Executive Vice President, Senior Vice President or any other title selected by the Board of Directors.

3.11 Secretary and Assistant Secretaries. The Secretary shall perform such duties and shall have such powers as the Board of Directors or the Chief Executive Officer may from time to time prescribe. In addition, the Secretary shall perform such duties and have such powers as are incident to the office of the secretary, including without limitation the duty and power to give notices of all meetings of stockholders and special meetings of the Board of Directors, to attend all meetings of stockholders and the Board of Directors and keep a record of the proceedings, to maintain a stock ledger and prepare lists of stockholders and their addresses as required, to be custodian of corporate records and the corporate seal and to affix and attest to the same on documents.

Any Assistant Secretary shall perform such duties and possess such powers as the Board of Directors, the Chief Executive Officer or the Secretary may from time to time prescribe. In the event of the absence, inability or refusal to act of the Secretary, the Assistant Secretary (or if there shall be more than one, the Assistant Secretaries in the order determined by the Board of Directors) shall perform the duties and exercise the powers of the Secretary.

In the absence of the Secretary or any Assistant Secretary at any meeting of stockholders or directors, the chairman of the meeting shall designate a temporary secretary to keep a record of the meeting.

3.12 Treasurer and Assistant Treasurers. The Treasurer shall perform such duties and shall have such powers as may from time to time be assigned by the Board of Directors or the Chief Executive Officer. In addition, the Treasurer shall perform such duties and have such powers as are incident to the office of treasurer, including without limitation the duty and power to keep and be responsible for all funds and securities of the corporation, to deposit funds of the corporation in depositories selected in accordance with these Bylaws, to disburse such funds as ordered by the Board of Directors, to make proper accounts of such funds, and to render as required by the Board of Directors statements of all such transactions and of the financial condition of the corporation.

The Assistant Treasurers shall perform such duties and possess such powers as the Board of Directors, the Chief Executive Officer or the Treasurer may from time to time prescribe. In the event of the absence, inability or refusal to act of the Treasurer, the Assistant Treasurer (or if there shall be more than one, the Assistant Treasurers in the order determined by the Board of Directors) shall perform the duties and exercise the powers of the Treasurer.

3.13 Salaries. Officers of the corporation shall be entitled to such salaries, compensation or reimbursement as shall be fixed or allowed from time to time by the Board of Directors.

ARTICLE IV

CAPITAL STOCK

4.1 Issuance of Stock. Subject to the provisions of the Certificate of Incorporation, the whole or any part of any unissued balance of the authorized capital stock of the corporation or the whole or any part of any shares of the authorized capital stock of the corporation held in the corporation's treasury may be issued, sold, transferred or otherwise disposed of by vote of the Board of Directors in such manner, for such lawful consideration and on such terms as the Board of Directors may determine.

4.2 Certificates of Stock. Every holder of stock of the corporation shall be entitled to have a certificate, in such form as may be prescribed by law and by the Board of Directors, certifying the number and class of shares owned by such holder in the corporation. Each such certificate shall be signed by, or in the name of the corporation by, the Chairman or Vice Chairman, if any, of the Board of Directors, or the President or a Vice President, and the Treasurer or an Assistant Treasurer, or the Secretary or an Assistant Secretary of the corporation. Any or all of the signatures on the certificate may be a facsimile.

Each certificate for shares of stock which are subject to any restriction on transfer pursuant to the Certificate of Incorporation, these Bylaws, applicable securities laws or any agreement among any number of stockholders or among such holders and the corporation shall have conspicuously noted on the face or back of the certificate either the full text of the restriction or a statement of the existence of such restriction.

There shall be set forth on the face or back of each certificate representing shares of such class or series of stock of the corporation a statement that the corporation will furnish without charge to each stockholder who so requests a copy of the full text of the powers, designations, preferences and relative, participating, optional or other special rights of each class of stock or series thereof and the qualifications, limitations or restrictions of such preferences and/or rights.

4.3 Transfers. Except as otherwise established by rules and regulations adopted by the Board of Directors, and subject to applicable law, shares of stock may be transferred on the books of the corporation by the surrender to the corporation or its transfer agent of the certificate representing such shares properly endorsed or accompanied by a written assignment or power of attorney properly executed, and with such proof of authority or the authenticity of signature as the corporation or its transfer agent may reasonably require. Except as may be otherwise required by law, by the Certificate of Incorporation or by these Bylaws, the corporation shall be entitled to treat the record holder of stock as shown on its books as the owner of such stock for all purposes, including the payment of dividends and the right to vote with respect to such stock, regardless of any transfer, pledge or other disposition of such stock until the shares have been transferred on the books of the corporation in accordance with the requirements of these Bylaws.

4.4 Lost, Stolen or Destroyed Certificates. The corporation may issue a new certificate of stock in place of any previously issued certificate alleged to have been lost, stolen or destroyed, upon such terms and conditions as the Board of Directors may prescribe, including the presentation of reasonable evidence of such loss, theft or destruction and the giving of such indemnity and posting

of such bond as the Board of Directors may require for the protection of the corporation or any transfer agent or registrar.

4.5 Record Date. The Board of Directors may fix in advance a date as a record date for the determination of the stockholders entitled to notice of or to vote at any meeting of stockholders, or entitled to receive payment of any dividend or other distribution or allotment of any rights in respect of any change, conversion or exchange of stock, or for the purpose of any other lawful action. Such record date shall not be more than 60 nor less than 10 days before the date of such meeting, nor more than 60 days prior to any other action to which such record date relates.

If no record date is fixed, the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day before the day on which notice is given, or, if notice is waived, at the close of business on the day before the day on which the meeting is held. If no record date is fixed, the record date for determining stockholders for any other purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating to such purpose.

A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting; provided, however, that the Board of Directors may fix a new record date for the adjourned meeting.

ARTICLE V

GENERAL PROVISIONS

5.1 Fiscal Year. Except as from time to time otherwise designated by the Board of Directors, the fiscal year of the corporation shall begin on the first day of January of each year and end on the last day of December in each year.

5.2 Corporate Seal. The corporate seal shall be in such form as shall be approved by the Board of Directors.

5.3 Waiver of Notice. Whenever notice is required to be given by law, by the Certificate of Incorporation or by these Bylaws, a written waiver signed by the person entitled to notice, or a waiver by electronic transmission by the person entitled to notice, whether before, at or after the time stated in such notice, shall be deemed equivalent to notice. Attendance of a person at a meeting shall constitute a waiver of notice of such meeting, except when the person attends a meeting for the express purpose of objecting at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened.

5.4 Voting of Securities. Except as the Board of Directors may otherwise designate, the Chief Executive Officer, the President (if the President shall be a different individual than the Chief Executive Officer) or the Treasurer may waive notice of, and act as, or appoint any person or persons to act as, proxy or attorney-in-fact for this corporation (with or without power of substitution) at any meeting of stockholders or securityholders of any other entity or organization, the securities of which may be held by this corporation.

5.5 Evidence of Authority. A certificate by the Secretary, or an Assistant Secretary, or a temporary Secretary, as to any action taken by the stockholders, directors, a committee or any officer or representative of the corporation shall as to all persons who rely on the certificate in good faith be conclusive evidence of such action.

5.6 Certificate of Incorporation. All references in these Bylaws to the Certificate of Incorporation shall be deemed to refer to the Certificate of Incorporation of the corporation, as amended and in effect from time to time.

5.7 Severability. Any determination that any provision of these Bylaws is for any reason inapplicable, illegal or ineffective shall not affect or invalidate any other provision of these Bylaws.

5.8 Pronouns. All pronouns used in these Bylaws shall be deemed to refer to the masculine, feminine or neuter, singular or plural, as the identity of the person or persons may require.

5.9 Exclusive Jurisdiction of Delaware Courts or the United States Federal District Courts. Unless the corporation consents in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for any state law claims for (i) any derivative action or proceeding brought on behalf of the corporation, (ii) any action asserting a claim of, or a claim based on, breach of a fiduciary duty owed by any current or former director, officer or other employee of the corporation to the corporation or the corporation's stockholders, (iii) any action asserting a claim arising pursuant to any provision of the General Corporation Law of the State of Delaware or the Certificate of Incorporation or these Bylaws (including the interpretation, validity or enforceability thereof), or (iv) any action asserting a claim governed by the internal affairs doctrine. Unless the corporation consents in writing to the selection of an alternative forum, the federal district courts of the United States of America shall be the sole and exclusive forum for resolving any complaint asserting a cause of action against any defendant arising under the Securities Act of 1933, as amended. Any person or entity purchasing or otherwise acquiring any interest in shares of capital stock of the corporation shall be deemed to have notice of and consented to the provisions of this Section 5.9.

ARTICLE VI

AMENDMENTS

These Bylaws may be altered, amended or repealed, in whole or in part, or new Bylaws may be adopted by the Board of Directors or by the stockholders as provided in the Certificate of Incorporation.

Adopted on and effective as of November 2, 2020

EXECUTION COPY

CO-DEVELOPMENT AGREEMENT

By and between

Alnylam Pharmaceuticals, Inc.,

BXLS V Bodyguard – PCP L.P.

AND

BXLS Family Investment Partnership V – ESC L.P.

Dated August 15, 2020

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT HAVE BEEN OMITTED AND REPLACED WITH “[***]”. SUCH IDENTIFIED INFORMATION HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE IT IS (I) NOT MATERIAL AND (II) WOULD LIKELY CAUSE COMPETITIVE HARM TO THE COMPANY IF DISCLOSED.

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CO-DEVELOPMENT AGREEMENT

This Co-Development Agreement (“Agreement”), made effective as of August 15, 2020 (the “Effective Date”), is by and between Alnylam Pharmaceuticals, Inc., a Delaware corporation (“Alnylam”), BXLS V Bodyguard – PCP L.P., a Delaware limited partnership organized and existing under the laws of the state of Delaware (for itself, and as the “Administrative Agent” hereunder), and BXLS Family Investment Partnership V – ESC L.P., a Delaware limited partnership organized and existing under the laws of the state of Delaware (each of BXLS V Bodyguard – PCP L.P. and BXLS Family Investment Partnership V – ESC L.P., a “Blackstone Entity” and collectively, “Blackstone”) (each, a “Party” and collectively, the “Parties”).

WHEREAS, Blackstone is in the business of facilitating, among other things, the development and approval of pharmaceutical products and desires to provide financing with respect to the design and conduct of certain Clinical Trials for the development of the Products for certain cardio-metabolic indications; and

WHEREAS, Alnylam has rights to the Products, is designing and conducting (or preparing to design and conduct) clinical trials of the Products, and would like to enter into an agreement with Blackstone to provide funding for the continued development of the Products.

NOW THEREFORE, in consideration of the mutual agreements contained herein and other good and valuable consideration, the sufficiency of which is hereby acknowledged, the Parties agree as follows:

ARTICLE 1

DEFINITIONS

1.1 Defined Terms. Initially capitalized terms will have the meaning ascribed to such terms in this Agreement, including the following terms which will have the following respective meanings:

- 1.1.1 “AAA” has the meaning ascribed to such term in Section 3.7.
- 1.1.2 “Administrative Agent” has the meaning ascribed to such term in the Preamble.
- 1.1.3 “Adverse Patent Impact” has the meaning ascribed to such term in Section 13.3.7.

1.1.4 “Affiliate” means, with respect to a Party, a business entity under common control with, or controlling or controlled by, such Party, with “control” meaning direct or indirect ownership of fifty percent (50%) or more of the voting interest in such other entity, and in the case of a partnership, control of the general partner. Notwithstanding the foregoing, neither The Blackstone Group Inc. nor any of its divisions, including Blackstone Life Science Advisors L.L.C., will be deemed to be an “Affiliate” of Blackstone. For clarity, with respect to Alnylam, “Affiliate” shall expressly include Alnylam (Bermuda) Ltd.

1.1.5 “Agent Indemnatee” has the meaning ascribed to such term in Section 7.5.1.5.

1.1.6 “Alliance Manager” has the meaning ascribed to such term in Section 5.1.5.

1.1.7 “ALN-AGT” means, subject to Section 3.9, (a) an RNAi therapeutic product also known as ALN-AGT targeting angiotensinogen which, as of the Effective Date, is in Development by Alnylam for the treatment of hypertension in high unmet need populations, as described on Exhibit A-1 hereto (an “Existing ALN-AGT Product,” in any form, formulation, dose or dosage form, including any salt thereof, under any brand name or as a generic product), [***].

1.1.8 “[***]”

1.1.9 “ALN-AGT Collateral” means all of Alnylam’s right, title and interest (excluding any leasehold interest) in, to and under the ALN-AGT Product IP, whether now owned or existing or hereafter arising or acquired, including, but not limited to, the Alnylam Intellectual Property set forth in Schedule 7.1.1(a) hereto, and all proceeds related to any of the foregoing.

1.1.10 “ALN-AGT Development Costs” has the meaning ascribed to such term in Section 4.1.2.

1.1.11 “ALN-AGT Development Plan” means a written plan for the ALN-AGT Development Program, the initial version of which is attached hereto as Exhibit B-1, and which will be subject to amendment by the JSC from time to time during the Development Term.

1.1.12 “ALN-AGT Development Program” means the development program to be undertaken by the Parties to Develop ALN-AGT that includes the CMC, clinical and regulatory strategy for ALN-AGT (including the Clinical Trials to be conducted by Alnylam for ALN-AGT).

1.1.13 “ALN-AGT Maximum Development Costs” has the meaning ascribed to such term in Section 4.1.2.

- 1.1.14 “ALN-AGT Phase 2 Development Costs” has the meaning ascribed to such term in Section 4.1.2.
- 6.1.2.1. 1.1.15 “ALN-AGT Phase 2 Success Payment Trigger” has the meaning ascribed to such term in Section 6.1.2.1.
- 1.1.16 “ALN-AGT Phase 2 Success Payments” has the meaning ascribed to such term in Section 6.1.2.1.
- 1.1.17 “ALN-AGT Phase 2 Success Target” has the meaning ascribed to such term in Section 6.2.2.2.
- 1.1.18 “ALN-AGT Phase 2 Trial” means the Phase 2 Clinical Trial for ALN-AGT described in the ALN-AGT Development Plan.
- 1.1.19 “ALN-AGT Phase 3 Approval Target” has the meaning ascribed to such term in Section 6.2.3.2.
- 1.1.20 “ALN-AGT Phase 3 Development Costs” has the meaning ascribed to such term in Section 4.1.2.
- 6.1.3. 1.1.21 “ALN-AGT Phase 3 Success Payment Trigger” has the meaning ascribed to such term in Section 6.1.3.
- 1.1.22 “ALN-AGT Phase 3 Success Payments” has the meaning ascribed to such term in Section 6.1.3.
- 1.1.23 “ALN-AGT Phase 3 Trial” means the Phase 3 Clinical Trial for ALN-AGT described in the ALN-AGT Development Plan.
- 1.1.24 “ALN-AGT Product IP” means any and all (i) Patents, Copyrights, Trademarks, trade secrets and other intellectual property recognized throughout the world under Applicable Law, including the Orange Book Patents, (other than Patents, Copyrights, Trademarks, trade secrets and other intellectual property recognized under Applicable Law consisting of RPA Assets (as defined in the Term Loan Agreement as in effect on the date hereof)) that are necessary for, and material to, the research, Development, manufacture, Commercialization, or other exploitation of ALN-AGT, in each case, during the term of this Agreement, (ii) all income, royalties, damages or payments now or hereafter due and/or payable under any of the foregoing or with respect to any of the foregoing, including, without limitation, damages or payments for past, present or future infringements, violations or misappropriations of any of the foregoing, (iii) the right to sue for past, present and future infringements, violations or misappropriations of any of the foregoing, (iv) any Regulatory Approval of ALN-AGT, and (v) all rights corresponding to any of the foregoing throughout the world; provided, however, that clause (i) shall not include any Shared IP.

1.1.25 “ALN-AGT Security Interest” has the meaning ascribed to such term in Section 7.1.2.

1.1.26 “Alnylam” has the meaning ascribed to such term in the Preamble.

1.1.27 “Alnylam Confidential Information” means all Confidential Information provided or disclosed by or on behalf of Alnylam or its Representatives to Blackstone or its Representatives hereunder. For clarity, Alnylam Confidential Information will include any and all CMC Information.

1.1.28 “Alnylam Improvements” has the meaning ascribed to such term in Section 10.1.1.3.

1.1.29 “Alnylam Indemnified Parties” has the meaning ascribed to such term in Section 11.1.1.

1.1.30 “Alnylam Intellectual Property” means all Intellectual Property owned or Controlled by Alnylam or its Affiliates that is necessary or useful for the Development, manufacture, use, Commercialization, import, or export of the Products, including Trial Inventions.

1.1.31 “Alnylam Obligations” means all indebtedness, liabilities and other obligations of Alnylam to Blackstone under or in connection with this Agreement and other documents executed in connection herewith, including, without limitation, all amounts payable to Blackstone pursuant to Article 6 hereof and any and all damages resulting from breach of this Agreement by Alnylam, all interest accrued thereon, all fees and all other amounts payable by Alnylam to Blackstone thereunder or in connection therewith, whether now existing or hereafter arising, and whether due or to become due, absolute or contingent, liquidated or unliquidated, determined or undetermined, and including interest that accrues after the commencement by or against Alnylam of any bankruptcy or insolvency proceeding

1.1.32 “Anti-Corruption Laws” means the U.S. Foreign Corrupt Practices Act, as amended, the UK Bribery Act 2010, as amended, and any other applicable anti-corruption laws and laws for the prevention of fraud, racketeering, money laundering or terrorism.

1.1.33 “Appellate Rules” has the meaning ascribed to such term in Section 14.10.2.5.

1.1.34 “Applicable Law” means the applicable laws, statutes, rules, regulations, guidelines, or other requirements of any Governmental Authorities (including any Regulatory Authorities), to the extent legally binding, that may be in effect from time to time in any country or regulatory jurisdiction. For clarity, Applicable Laws will include the FFDCA, the Anti-Corruption Laws, Data Privacy Laws and all laws, regulations and legally binding guidelines applicable to the Product Clinical Trials, including GCP, GLP, GMP and ICH guidelines.

1.1.35 “Approval Indication” means the treatment of the cardiomyopathy of wild-type or hereditary transthyretin-mediated amyloidosis.

1.1.36 “Blackstone” has the meaning ascribed to such term in the Preamble.

1.1.37 “Blackstone Collateral” means the ALN-AGT Collateral, the Vutrisiran Collateral and the Development Costs Account, and any proceeds therefrom.

1.1.38 “Blackstone Entity” has the meaning ascribed to such term in the Preamble.

1.1.39 “Blackstone Indemnified Parties” has the meaning ascribed to such term in Section 11.1.2.

1.1.40 “Blackstone Security Interests” has the meaning ascribed to such term in Section 7.1.2.

1.1.41 “Business Day” means a day that is not a Saturday, Sunday or a U.S. federal holiday. For the avoidance of doubt, with respect to any notice or other communication required to be given or delivered hereunder, limitations on the operations of commercial banks due to the outbreak of a contagious disease, epidemic or pandemic (including COVID-19), or any quarantine, shelter-in-place or similar or related directive, will not prevent a day that would otherwise be a Business Day hereunder from so being a Business Day.

1.1.42 “Calendar Quarter” means each successive period of three (3) consecutive calendar months ending on March 31, June 30, September 30 and December 31; provided, that, the (a) the first Calendar Quarter will begin on the Effective Date and end on the last day of the Calendar Quarter in which the Effective Date falls, and (b) the final Calendar Quarter will end on the last day of the Term.

1.1.43 “Calendar Year” means each successive period of twelve (12) months commencing on January 1 and ending on December 31; provided, that, (a) the first Calendar Year will begin on the Effective Date and end on December 31 of the Calendar Year in which the Effective Date falls, and (b) the final Calendar Year will end on the last day of the Term.

1.1.44 “Case Report Form” or “CRF” means the collection of documents designed specifically for recording data pursuant to a Protocol, which CRF will be completed for each Clinical Trial subject and will be in electronic form, validated and in compliance with all Applicable Laws.

1.1.45 “Change of Control” means, with respect to Alnylam, at any time prior to the date of the payment by Alnylam of the final Success Payment hereunder, (a) a merger, reorganization or consolidation with a Third Party which results in the voting securities of

Alnylam outstanding immediately prior thereto ceasing to represent, or being converted into or exchanged for voting securities that do not represent, at least fifty percent (50%) of the combined voting power of the voting securities of the surviving entity or the parent corporation of the surviving entity immediately after such merger, reorganization or consolidation, (b) a transaction in which a Third Party becomes the beneficial owner of fifty percent (50%) or more of the combined voting power of the outstanding securities of Alnylam, other than through the issuance of voting securities for the purpose of raising financing to one or more financial or institutional investors that are not then controlled by an entity engaged in the development or commercialization of pharmaceutical or biotechnology products, or (c) the sale or other transfer of all or substantially all of Alnylam's business or assets relating to a Product, provided that a Change of Control will not be deemed to have occurred in the event that the Third Party in any of the foregoing transactions is a venture capital fund, pension fund, investment fund, commercial or investment bank, insurance company, or similar financial institution, in each case that is not then a controlled Affiliate of a company engaged in the development and/or commercialization of pharmaceutical or biotechnology products.

1.1.46 "Claim" means any Third Party claim, demand, suit or cause of action.

1.1.47 "Clinical Hold" means, in the U.S., an order issued by FDA to the sponsor of a Clinical Trial to delay or suspend an ongoing Clinical Trial, as set forth in 21 U.S.C. §312.42, or outside of the U.S., the foreign equivalent thereof issued by the applicable Regulatory Authority.

1.1.48 "Clinical Investigator" means the principal investigator at each Site.

1.1.49 "Clinical Trial" means a Phase 1 Clinical Trial, a Phase 2 Clinical Trial, a Phase 3 Clinical Trial or any supplemental clinical trial (including a bridging study or a post-approval clinical study) required for the purpose of obtaining Regulatory Approval.

1.1.50 "Clinical Trial Activity" has the meaning ascribed to such term in Section 2.4.

1.1.51 "Clinical Trial Agreement" has the meaning ascribed to such term in Section 3.1.3.

1.1.52 "Clinical Trials Database" has the meaning ascribed to such term in Section 3.1.4.2.

1.1.53 "CMC" means chemistry, manufacturing and controls.

1.1.54 "CMC Information" means the CMC information intended or required for the submission of an IND or NDA.

1.1.55 “CMO” means contract manufacturing organization or contract development and manufacturing organization.

1.1.56 “Combination Product” means a product that includes Vutrisiran and at least one additional active pharmaceutical ingredient (whether co-formulated or co-packaged) that is not Vutrisiran.

1.1.57 “Code” means the U.S. Internal Revenue Code of 1986, as amended.

1.1.58 “Commercialization,” “Commercializing” or “Commercialize” means the commercial manufacture, marketing, promotion, sale or distribution of a Product. For clarity, Commercialization excludes all activities associated with Development and seeking Regulatory Approval for a Product.

1.1.59 “Commercially Reasonable Efforts” means, with respect to the efforts to be expended by Alnylam in the performance of Alnylam’s obligations hereunder for the Development and Commercialization of a Product, such level of efforts (including the devotion of such financial resources) as Alnylam would typically devote to a product of similar market potential and profitability and at a similar stage of Development as such Product (as applicable), in each case, considering relevant market factors, the risk-benefit assessment of the applicable Product including the data related to clinical outcomes and the safety profile, products in development or in the marketplace (excluding consideration of competitive products developed by Alnylam (or its successor or licensee)), pricing and reimbursement status achieved or likely to be achieved, and the scope or potential scope of Patent or other intellectual property protection; provided, however, that, to the extent that the performance of Alnylam’s obligations hereunder is adversely affected by Blackstone’s failure to perform its obligations hereunder, the impact on Alnylam of such performance failure by Blackstone will be taken into account in determining whether Alnylam has used its Commercially Reasonable Efforts to perform any such affected obligations.

1.1.60 “Completion Date” means, with respect to a particular Clinical Trial, the earlier of (a) the date of final database lock for such Clinical Trial and (b) the date such Clinical Trial or this Agreement is terminated.

1.1.61 “Confidential Information” of a Party means all information and materials provided or disclosed (including in written form, electronic form or otherwise) by, or on behalf of, such Party or its Representatives to the other Party or its Representatives in connection with this Agreement, including, technical, scientific, regulatory and other information, results, knowledge, techniques, reports, data, analyses, inventions, invention disclosures, plans, processes, methods, know-how, ideas, concepts, test data (including pharmacological, toxicological and clinical test data), analytical and quality control data, formulae, specifications, marketing, pricing, distribution, cost, sales, and manufacturing data and descriptions, as well as confidential or proprietary information of a Third Party that may

be disclosed hereunder. In addition, the terms and conditions of this Agreement will be deemed to be Confidential Information of both Blackstone and Alnylam.

1.1.62 “Confidentiality Agreement” means that certain Confidentiality Agreement, dated November 14, 2019, by and between Alnylam and Blackstone.

1.1.63 “Contingent Liabilities” means, for any Person, any direct or indirect liability, contingent or not, of that Person for (a) warranty obligations, (b) potential claims for damages, (c) assessments, and (d) any other condition, situation or set of circumstances involving various degrees of uncertainty that may result in a loss or liability.

1.1.64 “Control” or “Controlled” means (a) with respect to Intellectual Property, a Party’s ability to grant applicable licenses, sublicenses or other rights thereunder and (b) with respect to materials and documents, a Party’s ability to provide, or provide access to, such materials or documents, each without violating any contractual obligations to a Third Party. For clarity, if a Party only can grant a license or sublicense or provide rights or access of limited scope, for a specific purpose or under certain conditions due to an encumbrance, “Control” or “Controlled” will be construed to so limit such license, sublicense, provision of rights or access.

1.1.65 “Copyrights” means, collectively, all works of authorship, mask works and any and all other registered and unregistered copyrights and copyrightable works, and all applications, registrations, extensions, and renewals thereof.

1.1.66 “CRO” means contract research organization.

1.1.67 “CRO Agreement” has the meaning ascribed to such term in Section 2.5.

1.1.68 “CSR” means, with respect to a Product Clinical Trial, a clinical study report, or other equivalent document or series of materials, constituting a summary report of the clinical and medical data resulting from such Clinical Trial and prepared for incorporation into submissions seeking Regulatory Approval for a Product, and includes all statistical analyses of such data per the statistical analysis plan.

1.1.69 “Data Privacy Laws” means any applicable state, federal law or foreign regulation governing the provision, receipt, maintenance, storage, or destruction of personal data, including but not limited to any applicable provisions of the European Union General Data Protection Regulation, the United Kingdom Data Protection Act 2018, the California Consumer Privacy Act, the Health Insurance Portability and Accountability Act of 1996, the

Fair Credit Reporting Act, the Fair and Accurate Credit Transactions Act, and the Gramm Leach-Bliley Act.

1.1.70 “Data Room” means that certain electronic data room established by Alnylam [***] and to which Blackstone or its advisors were granted access prior to the Effective Date.

1.1.71 “Deposit Account Control Agreement” has the meaning ascribed to such term in Section 7.4.1(c).

1.1.72 “Develop,” “Developing,” “Developed” or “Development” means all clinical research and development activities conducted after filing an IND, including toxicology, pharmacology test method development and stability testing, process development, formulation development, quality assurance and quality control development, statistical analysis, conducting Clinical Trials, regulatory affairs, and obtaining and maintaining Regulatory Approval.

1.1.73 “Development Costs” means all internal and external costs incurred or paid by Alnylam in connection with the Development Programs.

1.1.74 “Development Costs Account” means a segregated deposit account with Bank of America, N.A. or other bank mutually acceptable to the Parties, subject to a deposit account control agreement between Bank of America, N.A. or such other bank mutually acceptable to the Parties, Alnylam and Blackstone, and any successor segregated deposit account established in accordance with Section 7.3.

1.1.75 “Development Events” means the Clinical Trial milestones set forth on Schedule 4.3 hereto.

1.1.76 “Development Plan” means, as applicable, the Vutrisiran Development Plan or the ALN-AGT Development Plan.

1.1.77 “Development Program” means, as applicable, the Vutrisiran Development Program or the ALN-AGT Development Program.

1.1.78 “Development Term” means, with respect to a Product and a Development Program, the period commencing on the Effective Date and ending on the later of (a) the latest of the Completion Dates of the Product Clinical Trials in such Development Program, and (b) the date on which all material efforts in pursuit of Regulatory Approval of such Product have been concluded or terminated.

1.1.79 “Disclosing Party” has the meaning ascribed to such term in Section 9.1.

1.1.80 “Dispute” has the meaning ascribed to such term in Section 14.10.

1.1.81 “Effective Date” has the meaning ascribed to such term in the Preamble.

1.1.82 “Election Date” has the meaning set forth in Section 3.9.2.

1.1.83 “EMA” means the European Medicines Agency and any successor agency thereto in the EU having substantially the same function.

1.1.84 “EU” means the European Union or any successor union of European states thereto having a substantially similar function.

1.1.85 “Excluded Licensing Transaction” means [***]

1.1.86 “Executive Officers” means the executive officers of each of Alnylam and Blackstone identified on Exhibit C.

1.1.87 “Existing ALN-AGT Product” has the meaning ascribed to such term in Section 1.1.7.

1.1.88 “Existing Licenses” means, (a) with respect to Vutrisiran, [***] and (b) with respect to ALN-AGT, [***]

1.1.89 “Event of Default” has the meaning ascribed to such term in Section 7.4.2.1.

1.1.90 “Existing Licensors” means, as applicable, [***].

1.1.91 “FDA” means the U.S. Food and Drug Administration and any successor agency thereto in the U.S. having substantially the same function.

1.1.92 “FFDCA” means the U.S. Food, Drug, and Cosmetic Act, as amended from time to time, together with any rules, regulations, requirements and guidances promulgated or issued thereunder (including all additions, supplements, extensions and modifications thereto).

1.1.93 “Force Majeure Event” has the meaning ascribed to such term in Section 14.4.

1.1.94 “Funding Tranche” means, with respect to the Vutrisiran Development Costs or the ALN-AGT Development Costs, a portion of such costs to be funded by Blackstone following Alnylam’s achievement of a Development Event, as set forth on Schedule 4.3 hereto.

1.1.95 “GAAP” means generally accepted accounting principles in the U.S., as consistently applied by the applicable Party.

1.1.96 [***].

1.1.97 [***].

1.1.98 [***].

1.1.99 [***].

1.1.100 “Good Clinical Practices” or “GCP” means all applicable requirements, standards, practices, and procedures for the design, conduct, performance, monitoring, auditing, recording, analysis and reporting of Clinical Trials including (i) FDA’s good clinical practice requirements under the FFDCA and 21 CFR Parts 11, 50, 54, 56, and 312, (ii) all requirements referred to in EudraLex Volume 10 (Guidelines for Clinical Trials) as well as all corresponding Applicable Laws implemented by relevant EU member states, (iii) ICH guidance for Good Clinical Practice, and (iv) the equivalent Applicable Laws in any relevant country, each as may be amended and applicable from time to time.

1.1.101 “Good Laboratory Practices” or “GLP” means all applicable requirements, standards, practices, and procedures for conducting non-clinical laboratory studies, including (i) FDA’s good laboratory practice requirements under the FFDCA and 21 CFR Part 58, (ii) the United States Animal Welfare Act, (iii) ICH Guidance on Nonclinical Safety Studies for the Conduct of Human Clinical Trials for Pharmaceuticals or the ICH Guidance on Safety Pharmacology Studies for Human Pharmaceuticals, (iv) EU Applicable Laws related to research and related uses of animals within any EU member state, including Directive 2010/63, and (v) the equivalent Applicable Laws in any relevant country, each as may be amended and applicable from time to time.

1.1.102 “Good Manufacturing Practices” or “GMP” means all applicable requirements, standards, practices, and procedures for the manufacture and testing of pharmaceutical materials including, (a) FDA’s current good manufacturing practices requirements under the FFDCA and 21 CFR Parts 210 and 211; (b) all requirements referred to in EudraLex Volume 4 (Guidelines for Good Manufacturing Practice), as well as all corresponding Applicable Laws implemented by relevant EU member states; (c) ICH Guidance on Good Manufacturing Practice for Active Pharmaceutical Ingredients; and (d) the equivalent Applicable Laws in any relevant country, each as may be amended and applicable from time to time.

1.1.103 “Governmental Authority” means any supranational, federal, national, state or local court, agency, authority, department, regulatory body or other governmental instrumentality.

1.1.104 “HELIOS-B Protocol” has the meaning ascribed to such term in Section 2.2.1.1.

1.1.105 “HELIOS-B Trial” means the registrational trial entitled “A Study to Evaluate Vutrisiran in Patients with Transthyretin Amyloidosis with Cardiomyopathy” with identifier NCT04153149.

1.1.106 “ICH” means the International Conference on Harmonization.

1.1.107 “IDMC” means the independent data monitoring committee for a Product Clinical Trial.

1.1.108 “IND” means an investigational new drug application, Clinical Trial application, Clinical Trial exemption, or similar application or submission filed with or submitted to a Regulatory Authority in a jurisdiction that is necessary to initiate human clinical testing of a pharmaceutical product in such jurisdiction, including any such application filed with the FDA pursuant to 21 C.F.R. Part 312, as well as all supplements, amendments, variations, extensions and renewals thereof that may be filed with respect to the foregoing.

1.1.109 “Indemnification Claim Notice” has the meaning ascribed to such term in Section 11.2.1.

1.1.110 “Indemnified Party” has the meaning ascribed to such term in Section 11.2.1.

1.1.111 “Indemnifying Party” has the meaning ascribed to such term in Section 11.2.1.

1.1.112 “Information” means technical or scientific know-how, trade secrets, methods, processes, formulae, designs, specifications and data, including biological, chemical, pharmacological, toxicological, pre-clinical, clinical, safety, manufacturing and quality control data and assays; in each case, whether or not confidential, proprietary, patented or patentable.

1.1.113 “Intellectual Property” means all intellectual property and industrial property rights of any kind or nature throughout the world, including all U.S. and foreign, (a) Patents; (b) Trademarks; (c) Copyrights; (d) regulatory filings (e.g., an NDA), (e) rights in computer programs (whether in source code, object code, or other form), algorithms, databases, compilations and data, technology supporting the foregoing, and all documentation, including user manuals and training materials, related to any of the foregoing; (f) trade secrets and all other Confidential Information, know-how, inventions, proprietary processes, formulae, models, and methodologies; (g) rights of publicity, privacy, and rights to personal information; (h) all rights in the foregoing and in other similar intangible assets; and (i) all applications and registrations for the foregoing.

1.1.114 “Intercreditor Agreement” means that certain Intercreditor Agreement, dated as of the date hereof, by and among Blackstone, Wilmington Trust,

National Association as Collateral Agent, and the other parties from time to time added thereto, as acknowledged and consented to by Alnylam.

1.1.115 [***].

1.1.116 [***].

1.1.117 “IP Security Agreement” has the meaning ascribed to such term in Section 7.4.1(a).

1.1.118 “IRB” means institutional review board, or its equivalent.

1.1.119 “JSC” has the meaning ascribed to such term in Section 5.1.1.

1.1.120 “JSC Chairperson” has the meaning ascribed to such term in Section 5.1.2.

1.1.121 “JSC Representative(s)” has the meaning ascribed to such term in Section 5.1.1.

1.1.122 “Knowledge” means the actual knowledge of [***].

1.1.123 “Licensing Transaction” means: [***].

1.1.124 “Lien” means a mortgage, deed of trust, levy, charge, pledge, hypothecation, assignment, deposit arrangement, lien (statutory or otherwise), or preference, priority or other security interest, preferential arrangement in the nature of a security interest or other encumbrance of any kind or nature whatsoever, whether voluntarily incurred or arising by operation of law or otherwise against any property (including any conditional sale and any financing lease having substantially the same economic effect as any of the foregoing).

1.1.125 “Losses” means liabilities, losses, costs, damages, fees or expenses (including reasonable legal expenses and attorneys’ fees) payable to a Third Party.

1.1.126 “Major Market Country” means each or any (as applicable) of the [***].

1.1.127 “Mandatory Recall” means, in the U.S., an FDA-mandated recall pursuant to 42 U.S.C. §262(d)(1), or in a country outside of the U.S., the foreign equivalent thereof mandated by the applicable Regulatory Authority.

1.1.128 “Material Adverse Event” means an event occurring after the Effective Date that has a material adverse effect on [***] *provided however*, that none of the following will constitute, or will be considered in determining whether there has occurred, a Material Adverse Event: (x) changes in laws or regulations or in the interpretations or

methods of enforcement thereof; (y) changes in the pharmaceutical or biotechnology industries in general; or (z) any earthquakes, hurricanes, tsunamis, tornadoes, floods, mudslides, wildfires or other natural disasters, weather conditions, sabotage, terrorism, military action or war (whether or not declared) or other Force Majeure Events.

1.1.129 “Material Anti-Corruption Law Violation” means a violation by a Party or its Affiliate of an Anti-Corruption Law relating to the subject matter of this Agreement that would, if it were publicly known, have a material adverse effect on the other Party or its Affiliate because of its relationship with such Party.

1.1.130 “Material Impact” has the meaning ascribed to such term in Section 3.7.

1.1.131 [***].

1.1.132 [***].

1.1.133 “MHRA” means the Medicines and Healthcare products Regulatory Agency.

1.1.134 “Multiplier on Invested Capital” or “MoIC” means (a) 2.5x for Vutrisiran Development Costs (subject to Section 6.1.1.3(ii)), (b) 3.25x for ALN-AGT Phase 2 Development Costs (subject to Section 6.1.2.2(ii)), and (c) 4.5x for ALN-AGT Phase 3 Development Costs (subject to Section 6.1.3.2(ii)).

1.1.135 “NDA” means a new drug application, including a supplement to a new drug application, submitted to FDA or similar application or supplemental application submitted to a Regulatory Authority outside of the U.S. for the purpose of obtaining Regulatory Approval to market and sell a Product.

1.1.136 “Net Sales” means, for any period and for any country, the total aggregate amount billed during such period in such country by Alnylam, its Affiliates or sublicensees in such country for all sales of Vutrisiran to Third Parties (other than to a sublicensee of Alnylam or its Affiliates) after deducting, if not previously deducted, from the amount invoiced or received, the following deductions to the extent actually applied or taken with respect to such sales of Vutrisiran:

[***]

Such amounts deducted from Alnylam’s gross sales of Vutrisiran will be determined from Alnylam’s books and records that are maintained in accordance with GAAP, applied on a consistent basis.

If Vutrisiran is sold as a Combination Product, the Net Sales from the Combination Product, for the purposes of determining milestones and royalties, shall be determined by multiplying

the Net Sales of the Combination Product during the applicable Calendar Quarter, by the fraction, $A/(A+B)$, where A is the average sale price of Vutrisiran when sold separately in finished form and B is the average sale price of the other active compounds or active ingredients included in the Combination Product when sold separately in finished form, in each case during the applicable Calendar Quarter or, if sales of both Vutrisiran and the other active compounds or active ingredients did not occur in such period, then in the most recent Calendar Quarter in which sales of both occurred. If such average sale price cannot be determined for both Vutrisiran and all other active compounds or active ingredients included in the Combination Product, Net Sales for the purposes of determining milestones and royalties shall be calculated by multiplying the Net Sales of the Combination Product by the fraction of $C/(C+D)$ where C is the fair market value of Vutrisiran and D is the fair market value of all other active compounds or active ingredients included in the Combination Product. In such event, Alnylam will in good faith make a determination of the respective fair market values of Vutrisiran and all other active compounds or active ingredients included in the Combination Product (provided that such determination shall be no less favorable to Blackstone than the corresponding determination made under [***]), and shall notify Blackstone of such determination and provide Blackstone with Alnylam's basis for such determination. If Blackstone in good faith does not agree with such determination, Blackstone shall give Alnylam written notice of its disagreement within [***] after receiving the relevant report pursuant to Section 14.3, and the provisions of Section 14.10 shall apply.

Sales between or among Alnylam and its Affiliates and sublicensees shall be excluded from the computation of Net Sales, but Net Sales shall include sales to the first Third Party (other than a sublicensee of Alnylam or its Affiliate) thereafter by Alnylam or its Affiliates or sublicensees.

1.1.137 “Orange Book Patents” means the Patents listed for a Product in the FDA's Orange Book pursuant to 21 U.S.C. §355(b)(1), as such patent listing may be amended from time to time, together with all foreign counterpart Patents.

1.1.138 “Party” or “Parties” has the meaning ascribed to such term in the Preamble.

1.1.139 “Patent” will mean patents, patent applications, patent disclosures, and all related continuations, continuations-in-part, divisionals, reissues, re-examinations, substitutions, and extensions thereof.

1.1.140 “Paying Party” has the meaning ascribed to such term as in Section 6.5.2.1.

1.1.141 “Permitted Liens” means (a) the Existing Licenses, (b) any license agreement entered into by Alnylam after the Effective Date, subject to Section 3.7, (c) Liens with regard to the ALN-AGT Collateral and the Vutrisiran Collateral pursuant to the Term Loan Agreement and the Intercreditor Agreement, (d) Liens in favor of banking or

other financial institutions or entities maintaining a Development Costs Account permitted under a Deposit Account Control Agreement, and (e) Liens in favor of Blackstone.

1.1.142 “Permitted Third Party” means any CRO, Site, Clinical Investigator or Vendor to whom Alnylam has delegated responsibility or whom Alnylam has engaged in connection with the Clinical Trial Activities or any CMO whom Alnylam has engaged to perform CMC related activities (including supply of Product for use in the Product Clinical Trials). For clarity, Third Parties that have been delegated responsibility by or engaged by a Permitted Third Party will be considered Permitted Third Parties.

1.1.143 “Person” means any individual, corporation, general or limited partnership, limited liability company, joint venture, estate, trust, association, organization, labor union, or other entity or Governmental Authority.

1.1.144 “Phase 1 Clinical Trial” means any clinical trial as described in 21 C.F.R. §312.21(a), or, with respect to a jurisdiction other than the U.S., a similar clinical trial.

1.1.145 “Phase 1 Success Criteria” means, with respect to the Phase 1 Clinical Trial for ALN-AGT, acceptable safety, efficacy and pharmacodynamic/ pharmacokinetic results for such Phase 1 Clinical Trial for ALN-AGT relative to the planned Phase 2 Clinical Trials for ALN-AGT.

1.1.146 “Phase 2 Clinical Trial” means any clinical trial as described in 21 C.F.R. §312.21(b), or, with respect to a jurisdiction other than the U.S., a similar clinical trial.

1.1.147 “Phase 2 Success Criteria” means with respect to a Phase 2 Clinical Trial for ALN-AGT, (a) [***] or (b) [***] provided that, in each case of (a) and (b) [***].

1.1.148 “Phase 3 Clinical Trial” means any clinical trial as described in 21 C.F.R. §312.21(c) (as amended from time to time), or, with respect to a jurisdiction other than the U.S., a similar clinical trial, which clinical trial is intended to generate sufficient data and results (together with data from any prior clinical trials conducted for the applicable Product) to support the filing of an NDA for such Product.

1.1.149 “Phase 3 Success Criteria” means, (a) [***] or (b) [***]; provided that, in each case of (a) and (b), as applicable, [***].

1.1.150 “Phase 3 Clinical Trial Protocol” has the meaning ascribed to such term in Section 2.2.1.

1.1.151 “PMDA” means the Pharmaceuticals and Medical Devices Agency of Japan or any successor agency thereto in Japan having substantially the same function.

1.1.152 “Product” or “Products” means, as applicable, either or both of Vutrisiran and ALN-AGT.

1.1.153 “Product Clinical Trial” means a Clinical Trial for a Product that is included in a Development Program for such Product. For clarity, with respect to Vutrisiran, “Product Clinical Trial” will include the HELIOS-B Trial.

1.1.154 “Product Patents” has the meaning ascribed to such term in Section 12.2.10.

1.1.155 “Protocol” means, with respect to a Product Clinical Trial, the documentation describing the objective, design, methodology, statistical considerations and organization of such Product Clinical Trial.

1.1.156 “Receiving Party” has the meaning ascribed to such term in Section 9.1.

1.1.157 “Recipient Party” has the meaning ascribed to such term in Section 6.5.2.1.

1.1.158 “Regulatory Approval” means the approval of an NDA for a Product: (a) by the FDA in the U.S.; (b) by the EMA in the EU; (c) by the MHRA in the United Kingdom; or (d) by the PMDA in Japan. For clarity, “Regulatory Approval” excludes any pricing or reimbursement approval that may be necessary or useful for marketing or sale of a Product in any country or regulatory jurisdiction.

1.1.159 “Regulatory Authority” means, in a particular country or regulatory jurisdiction, any applicable Governmental Authority involved in authorizing an IND to initiate or conduct clinical testing in humans or involved in granting Regulatory Approval, including FDA, EMA, MHRA and the PMDA.

1.1.160 “Removal Effective Date” has the meaning ascribed to such term in Section 7.5.6.1.

1.1.161 “Required Investors” means, at any time, one or more of the Blackstone Entities having funded more than [***] of the aggregate Vutrisiran Development Costs and ALN-AGT Development Costs as of such time under this Agreement.

1.1.162 “Research Results” means all Information arising out of or resulting from the Product Clinical Trials and the CMC activities contemplated by the Development Programs, including the Clinical Trials Database.

1.1.163 “Resignation Effective Date” has the meaning ascribed to such term in Section 7.5.6.1.

1.1.164 “Representatives” means, with respect to a Party, such Party’s Affiliates, and its and their respective officers, directors, employees, agents, representatives, consultants, and, as applicable, its Permitted Third Parties engaged in connection with the subject matter of this Agreement.

1.1.165 “Royalty” has the meaning ascribed to such term in Section 6.1.1.2.

1.1.166 “Royalty Term” means the period commencing with a commercial sale of Vutrisiran giving rise to Net Sales following the first Regulatory Approval of Vutrisiran for the Approval Indication and ending on the date that is [***] years thereafter.

1.1.167 “Secured Parties” means, collectively, the Administrative Agent and Blackstone.

1.1.168 “Serious Safety Issue” means any SUSAR or series of SUSARs directly related to or caused by the administration of a Product in the conduct of a Product Clinical Trial where [***].

1.1.169 “Shared IP” means Patents, Copyrights, Trademarks, trade secrets and other intellectual property recognized under Applicable Law that are necessary for, and material to, the research, Development, Manufacture, Commercialization, or other exploitation of any product or program of Alnylam other than ALN-AGT and Vutrisiran.

1.1.170 “Site” has the meaning ascribed to such term in Section 3.1.3.

1.1.171 [***].

1.1.172 “Success Criteria” means, as applicable, each of the Phase 1 Success Criteria, the Phase 2 Success Criteria or the Phase 3 Success Criteria.

1.1.173 “Success Payments” means, as applicable, any or all of the Vutrisiran Success Payments, the ALN-AGT Phase 2 Success Payments, or the ALN-AGT Phase 3 Success Payments.

1.1.174 “Success Payment Trigger” means, as applicable, the Vutrisiran Success Payment Trigger, the ALN-AGT Phase 2 Success Payment Trigger, or the ALN-AGT Phase 3 Success Payment Trigger.

1.1.175 “SUSAR” means a suspected unexpected serious adverse reaction, without regard to causality, that is life-threatening (i.e., causes an immediate risk of

death) or that results in any of the following outcomes: death; in-patient hospitalization or prolongation of existing hospitalization; persistent or significant disability or incapacity (i.e., substantial disruption of the ability to conduct normal life functions); or a congenital anomaly or birth defect. For clarity, a planned medical or surgical procedure is not, in itself, a SUSAR.

1.1.176 “Term Loan Agreement” means that certain Credit Agreement dated as of April 10, 2020, among Alnylam, the Guarantors (as defined in the Term Loan Agreement), the Lenders (as defined in the Term Loan Agreement) and Wilmington Trust, National Association, as amended, restated, or otherwise modified from time to time.

1.1.177 “Term” has the meaning ascribed to such term in Section 13.1.

1.1.178 “Third Party” means any Person other than Alnylam, Blackstone and their Affiliates.

1.1.179 “Third Party Infringement” means any actual or threatened infringement, misappropriation, or other violation by a Third Party of any Intellectual Property Controlled by Alnylam that relates to this Agreement or a Product, including the Trial Inventions.

1.1.180 “Timeline” has the meaning ascribed to such term in Section 2.4.

1.1.181 “Trademarks” means, collectively, all registered and unregistered marks, trade dress rights, logos, taglines, slogans, Internet domain names, web addresses, and other indicia of origin, together with the goodwill associated with any of the foregoing, and all applications, registrations, extensions and renewals thereof, selected for use on a Product.

1.1.182 “Transaction Agreements” means, collectively, this Agreement, the Deposit Account Control Agreement, the IP Security Agreements and the Intercreditor Agreement.

1.1.183 “Trial Invention” has the meaning set forth in Section 10.1.1.3.

1.1.184 “UCC” means the Uniform Commercial Code, as the same may, from time to time, be enacted and in effect in the State of Delaware; provided, that, to the extent that the UCC is used to define any term herein and such term is defined differently in different Articles or Divisions of the UCC, the definition of such term contained in Article or Division 9 will govern; and provided further, that in the event that, by reason of mandatory provisions of law, any or all of the attachment, perfection or priority of, or remedies with respect to, the Blackstone Security Interest on any Blackstone Collateral is governed by the Uniform Commercial Code in effect in a jurisdiction other than the State of Delaware, the term “UCC” will mean the Uniform Commercial Code as enacted and in effect in such other

jurisdiction solely for purposes of the provisions thereof relating to such attachment, perfection, priority or remedies and for purposes of definitions relating to such provisions.

1.1.185 “United Kingdom” means Great Britain and Northern Ireland.

1.1.186 “U.S.” or “USA” means the United States of America, its territories and possessions, including Puerto Rico.

1.1.187 “Vendor(s)” has the meaning ascribed to such term in Section 2.5.

1.1.188 “Vutrisiran” means the investigational RNAi therapeutic product also known as ALN-TTRsc02 that targets transthyretin, which, as of the Effective Date, is being Developed by Alnylam, as further described on Exhibit A-2 hereto, in any form, formulation, dose or dosage form, including any salt thereof, under any brand name or as a generic product.

1.1.189 “Vutrisiran Approval Target” has the meaning ascribed to such term in Section 6.2.1.2.

1.1.190 [***].

1.1.191 “Vutrisiran Collateral” means all of Alnylam’s right, title and interest (excluding any leasehold interest) in, to and under the Vutrisiran Product IP, whether now owned or existing or hereafter arising or acquired, including, but not limited to, the Alnylam Intellectual Property set forth in Schedule 7.1.1(b) hereto, and all proceeds related to any of the foregoing.

1.1.192 “Vutrisiran Development Costs” has the meaning ascribed to such term in Section 4.1.1.

1.1.193 “Vutrisiran Development Plan” means a written plan for the Vutrisiran Development Program, the initial version of which is attached hereto as Exhibit B-2, and which will be subject to amendment by the JSC from time to time during the Development Term.

1.1.194 “Vutrisiran Development Program” means the development program to be undertaken by the Parties to Develop Vutrisiran that includes the CMC, clinical and regulatory strategy for Vutrisiran (including the Clinical Trials to be conducted by Alnylam for Vutrisiran).

1.1.195 “Vutrisiran Maximum Development Costs” has the meaning ascribed to such term in Section 4.1.

1.1.196 “Vutrisiran Product IP” means any and all (i) Patents, Copyrights, Trademarks, trade secrets and other intellectual property recognized throughout the world under Applicable Law, including the Orange Book Patents, (other than Patents, Copyrights, Trademarks, trade secrets and other intellectual property recognized under Applicable Law consisting of RPA Assets (as defined in the Term Loan Agreement as in effect on the date hereof)) that are necessary for, and material to, the research, Development, manufacture, Commercialization, or other exploitation of Vutrisiran, in each case, during the term of this Agreement, (ii) all income, royalties, damages or payments now or hereafter due and/or payable under any of the foregoing or with respect to any of the foregoing, including, without limitation, damages or payments for past, present or future infringements, violations or misappropriations of any of the foregoing, (iii) the right to sue for past, present and future infringements, violations or misappropriations of any of the foregoing, (iv) any Regulatory Approval of Vutrisiran and (v) all rights corresponding to any of the foregoing throughout the world; provided, however, that clause (i) shall not include any Shared IP.

1.1.197 “Vutrisiran Success Payments” has the meaning ascribed to such term in Section 6.1.1.1.

1.1.198 “Vutrisiran Success Payment Trigger” has the meaning ascribed to such term in Section 6.1.1.1.

1.1.199 “Withholding Party” has the meaning ascribed to such term in Section 6.5.2.2.

1.2 Construction. For purposes of this Agreement: (1) words in the singular will be held to include the plural and vice versa as the context requires; (2) the words “including” and “include” will mean “including, without limitation,” unless otherwise specified; (3) the terms “hereof,” “herein,” “herewith,” and “hereunder,” and words of similar import will, unless otherwise stated, be construed to refer to this Agreement as a whole and not to any particular provision of this Agreement; (4) all references to “Section” and “Exhibit,” unless otherwise specified, are intended to refer to a Section or Exhibit of or to this Agreement; (5) the term “or” will be interpreted in the inclusive sense commonly associated with the term “and/or”, (6) words of the masculine, feminine or neuter gender will mean and include the correlative words of other genders; (7) unless otherwise specified, references to an agreement or other document include references to such agreement or document as from time to time amended, restated, reformed, supplemented or otherwise modified in accordance with the terms hereof, and include any annexes, exhibits and schedules attached thereto; (8) reference to any Applicable Law will include such Applicable Law as from time to time in effect, including any amendment, modification, codification, replacement or reenactment thereof or any substitution therefor; (9) references to any Person will be construed to include such Person’s successors and permitted assigns (subject to any restrictions on assignment, transfer or delegation set forth herein), and any references to a Person in a particular capacity excludes such Person in other capacities; (10) in the computation of a period of time from a specified date to a later specified date, the word “from” means “from and including” and

each of the words “to” and “until” means “to but excluding;” and (11) where any payment is to be made, any funds are to be applied or any calculation is to be made under this Agreement on a day that is not a Business Day, unless this Agreement otherwise provides, such payment will be made, such funds will be applied and such calculation will be made on the succeeding Business Day, and payments will be adjusted accordingly.

1.3 Conflicts. In the event of any conflict between the terms of this Agreement, the Protocol or any other Exhibit, the Protocol will control (as applicable), followed by the terms of this Agreement, and followed by any applicable other Exhibit.

ARTICLE 2

THE DEVELOPMENT PROGRAM

2.1 The Development Programs.

2.1.1 Efforts. Alnylam will use Commercially Reasonable Efforts to conduct and complete the Vutrisiran Development Program and the ALN-AGT Development Program at its sole expense (subject to Section 4.1) in accordance with this Agreement.

2.1.2 Compliance with Laws. Alnylam will perform its Development obligations in compliance with all Applicable Laws in all material respects.

2.2 The Protocols.

2.2.1 The Protocols.

2.2.1.1 Vutrisiran. The Protocol for the HELIOS-B Trial (the “HELIOS-B Protocol”) existing on the Effective Date, which is named “Clinical Study Protocol ALN-TTRSC02-003” and dated as of 22 August 2019, has been provided to Blackstone.

2.2.1.2 ALN-AGT. The Protocol for each Product Clinical Trial included in the ALN-AGT Development Program will be prepared by Alnylam using Commercially Reasonable Efforts and will be reviewed and discussed by the JSC in accordance with Section 5.1.

2.2.2 Protocol Approval. Alnylam will be responsible for obtaining all necessary approvals for the applicable Protocols prior to commencing a Product Clinical Trial. Each Party will reasonably cooperate with the other in such regard.

2.3 Sponsor.

2.3.1 Sponsorship and Responsibilities. Alnylam or its agent or licensee will be the sponsor of the Product Clinical Trials, and will have all responsibilities of a sponsor as specified in Applicable Laws.

2.3.2 Compliance with the Protocol. Alnylam will use Commercially Reasonable Efforts to conduct all Product Clinical Trials and perform all other responsibilities assigned to it hereunder in connection with any such Product Clinical Trial in compliance with the applicable Protocol.

2.4 Timeline. A good faith, non-binding estimate of the timeline for conducting the Product Clinical Trials under each Development Program, together with a non-binding budget for each Development Program that provides such detail consistent with Alnylam's standard practices, is attached as Exhibit D hereto (the "Timeline"). Alnylam will update the Timeline from time-to-time during the Development Term to reflect any material updates, and will report such revisions to the JSC in accordance with Section 5.2.1.6. At the next scheduled meeting of the JSC in accordance with the first sentence of Section 5.1.3, Alnylam will update the JSC regarding the completion or achievement of events or activities set forth in the Timeline, as applicable. In the event of any material delays in activities set forth in the Timeline, the Parties will discuss through the JSC necessary updates to the funding schedule for the applicable Development Program set forth in Section 4.3

2.5 CROs and Vendors. Alnylam may delegate any of its responsibilities described in Section 2.3 to its Affiliates (subject to Section 14.1) and CROs. Alnylam will use Commercially Reasonable Efforts to cause each of its CROs to perform the responsibilities delegated to each such CRO in material compliance with the applicable Protocol and all Applicable Laws. Alnylam will be permitted to contract for services, equipment, tools, materials or supplies required for the Product Clinical Trials or Regulatory Approval with any of its Affiliates, CMOs or other Third Party providers (each, a "Vendor").

2.6 Responsibility. Alnylam will remain responsible for all of its obligations under this Agreement, notwithstanding any delegation to an Affiliate or a CRO or any contracting to a Vendor. Alnylam will use Commercially Reasonable Efforts to oversee the services of its Affiliates and any CRO or Vendor utilized to provide services hereunder.

2.7 Reasonable Assistance. Promptly following the Effective Date during the Development Term, should Blackstone have any questions directly pertaining to such Protocols and Products, the Blackstone Alliance Manager will direct said questions to the Alnylam Alliance Manager. The Alnylam Alliance Manager will promptly coordinate the response to such questions received from Blackstone in accordance with the foregoing sentence, and, to the extent necessary to respond to Blackstone's questions, Alnylam will make available one (1) or more individuals at reasonable times during normal business hours for the purpose of assisting in responding to Blackstone's questions.

ARTICLE 3

DEVELOPMENT PROGRAM RESPONSIBILITIES

3.1 Conduct of Clinical Trials.

3.1.1 Responsibility. Alnylam will have sole responsibility for the conduct of the Product Clinical Trials, in consultation with the JSC.

3.1.2 Compliance. Alnylam will conduct the Development Programs and perform all of its duties and responsibilities hereunder in accordance with the Development Plans and in compliance with all Applicable Laws in all material respects. Alnylam will use Commercially Reasonable Efforts to oversee the manufacture of the Products, and comply (and require that all Permitted Third Parties of Alnylam comply) with all Applicable Laws with respect to the research, development, manufacture, testing, analysis, labeling, storage, handling, disposal, transfer and use of the Products in all material respects.

3.1.3 Sites and Clinical Investigators. Alnylam will be solely responsible for selecting the study sites to conduct the Product Clinical Trials. Alnylam will use Commercially Reasonable Efforts to enter, or to cause its Affiliates or CROs to enter, as applicable, into an agreement with each study site ("Clinical Trial Agreement") and upon execution of such Clinical Trial Agreement, such study site will be deemed a "Site") on commercially reasonable and customary terms, consistent with industry standards for similar agreements.

3.1.4 Data Collection and Data Management.

3.1.4.1 CRF. Alnylam will be solely responsible for preparing the form of CRF for the Product Clinical Trials in accordance with the applicable Protocol.

3.1.4.2 Clinical Trials Database; Registries. Alnylam will be responsible for establishing and maintaining a Clinical Trial database for the data collected from each Site for the Product Clinical Trials (the "Clinical Trials Database"). Alnylam will be responsible for registering, maintaining and updating any registries pertaining to the Product Clinical Trials to the extent required by any Applicable Laws, including www.clinicaltrials.gov, www.clinicalstudyresults.org, and the PHRMA Website Synopsis, as applicable.

3.1.5 IRBs and Other Ethics Committees. Alnylam will be solely responsible for (a) obtaining the approval of the IRBs and other ethics committees required prior to commencing, and during, the Product Clinical Trials at every Site, and responding to all queries from all IRBs and other ethics committees, (b) ensuring that IRBs and such other relevant ethics committees have current registrations and accreditations, and (c) providing all

ethics committees, including all IRBs, and Regulatory Authorities, with all necessary documentation prior to, and during the course of, the Product Clinical Trials.

3.1.6 Completion of the Clinical Trials; Final CSR. Alnylam will use Commercially Reasonable Efforts to keep the Sites participating in the Product Clinical Trials operational, as reasonably necessary or desirable to complete the Development Programs. The CSR for any Product Clinical Trial will be prepared by Alnylam, and will comply with all Applicable Laws in all material respects, including ICH E3 guidelines. The final, signed CSR for any Product Clinical Trial will be provided to the JSC promptly following the Completion Date of each such Product Clinical Trial. If there are any additional material safety or efficacy data pertaining to such Product Clinical Trial that come into the possession of Alnylam after it has provided Blackstone with the final Clinical Trial CSR, Alnylam will prepare and promptly provide Blackstone with a supplement to such CSR.

3.2 Audits.

3.2.1 By Alnylam. Alnylam will use Commercially Reasonable Efforts to conduct quality oversight inspections and audits of the facilities and services of the Permitted Third Parties utilized by Alnylam, and will conduct quality oversight inspections and audits of the manufacturing facilities for the Products in accordance with its internal policies.

3.2.2 Remediation. Alnylam will use Commercially Reasonable Efforts to remediate (or have the applicable Permitted Third Party remediate) any material deficiencies identified in any such inspection or audit that are confirmed by Alnylam, within [***] following such confirmation. Any such remediation efforts shall, as between the Parties, be at Alnylam's cost and expense.

3.3 Product.

3.3.1 Supply of the Product. Alnylam or its Affiliate will be the manufacturer of the Products for the Product Clinical Trials, either directly or through a Vendor, and will use Commercially Reasonable Efforts to ensure (a) a supply of the Products sufficient for the conduct of the Product Clinical Trials, and (b) that such supply conforms in all material respects to the applicable release specifications that are necessary to conduct such Product Clinical Trials.

3.3.2 Product Complaints. Alnylam will be solely responsible for, and will use Commercially Reasonable Efforts to investigate and resolve, complaints related to the Products, including complaints pertaining to the manufacturing, appearance or general physical characteristics of the Products or other processes at the manufacturing facility.

3.4 Pharmacovigilance and Safety Information Exchange. Alnylam will promptly (but in any event within [***] of Alnylam's actual awareness thereof) report to the JSC any

Serious Safety Issue for (a) Product Clinical Trial subjects who receive a Product, or (b) individuals otherwise exposed to a Product.

3.5 Product Recalls. Alnylam will be solely responsible for the operational execution of any recall of a Product; provided that, Alnylam will inform the JSC regarding the decision to initiate any such recall. The costs for any such recall will be at Alnylam's sole cost and expense, and, with respect to Vutrisiran, except with respect to the cost of any replacement Product associated with any such recall, such costs shall not be subject to deduction from Net Sales in the calculation of the Royalty owed to Blackstone pursuant to Section 6.1.1.2.

3.5.1 Conduct of Clinical Trials. Alnylam will use Commercially Reasonable Efforts to complete the Product Clinical Trials in accordance with the Timeline, as such Timeline may be revised from time-to-time in accordance with Section 2.4.

3.5.2 Regulatory Approval. Upon achievement of the Phase 3 Success Criteria for each Product, Alnylam will use Commercially Reasonable Efforts to obtain Regulatory Approval for such Product in the U.S. or EU, including filing an NDA for such Product with the applicable Regulatory Authority within [***] of the date of achievement of the Phase 3 Success Criteria for such Product. In the event that Alnylam fails to use Commercially Reasonable Efforts to so obtain Regulatory Approval for a Product, including the obligation to file an NDA for a Product within [***] of the date of achievement of the Phase 3 Success Criteria for such Product, and this failure is not cured as set forth in Section 13.3.1, Blackstone may terminate this Agreement pursuant to Section 13.3.1.

3.5.3 Commercialization. Following the achievement of Regulatory Approval of a Product in any country in the Major Market Countries, Alnylam will use Commercially Reasonable Efforts to Commercialize such Product in such country.

3.6 Disclosures by Alnylam. Promptly following the Effective Date and thereafter during the Development Term, Alnylam will promptly provide Blackstone with copies of information or documents relating to [***]. For clarity, Alnylam will remain the sole owner of, and will retain all right, title and interest in, to and under all such documents and information, and such documents and information will be Alnylam Confidential Information.

3.7 Licensing Transactions. Prior to entering into a Licensing Transaction other than an Excluded Licensing Transaction in any of the Major Market Countries, Alnylam will provide Blackstone with written notice of such proposed Licensing Transaction that includes a non-binding term sheet or comparable document summarizing the material terms of the such proposed Licensing Transaction to the JSC; provided, however, that Alnylam may redact or withhold such information in its reasonable discretion to protect proprietary or competitively sensitive information, or any information protected by attorney-client or other similar privilege. If Blackstone believes that such Licensing Transaction would [***] (a "Material Impact"), Blackstone will provide a written notice to Alnylam with respect thereto

that sets forth the basis for Blackstone's belief as to a Material Impact within [***] of Blackstone's receipt of Alnylam's written notice with respect to such Licensing Transaction in accordance with this Section 3.7. The Executive Officers will promptly confer to discuss such dispute. If the Executive Officers are unable to resolve such dispute within [***] of the date of Alnylam's receipt of Blackstone's written notice under this Section 3.7, then the dispute will be submitted to binding arbitration for resolution before a single neutral arbitrator under the American Arbitration Association's ("AAA") expedited arbitration rules, which arbitrator will be mutually agreeable to both Parties and have significant expertise on the subject matter to be decided (provided that if the Parties have not mutually agreed on such arbitrator within [***] after the submission of such dispute for arbitration, the AAA will designate such arbitrator), such arbitration to be concluded and the arbitrator's award to be rendered within [***] of the submission of the dispute for arbitration. The sole issue to be decided in the arbitration will be whether such Licensing Transaction by Alnylam would have a substantial likelihood of having a Material Impact. In the event the arbitrator determines that such Licensing Transaction by Alnylam would have a substantial likelihood of having a Material Impact, Blackstone may within [***] exercise its right to terminate this Agreement under Section 13.3.5, provided that if Blackstone elects to continue this Agreement or does not exercise its right to terminate under Section 13.3.5, this Agreement will remain in full force and effect without modification. In the event the arbitrator determines that such Licensing Transaction by Alnylam would not have a substantial likelihood of having a Material Impact, this Agreement will remain in full force and effect without modification.

3.8 Change of Control. Following a Change of Control, Alnylam will provide Blackstone with written notice of such Change of Control within [***]. In the event that Blackstone believes that such Change of Control would have a substantial likelihood of having a Material Impact, Blackstone will provide a written notice to Alnylam with respect thereto that sets forth the basis for Blackstone's belief as to a Material Impact within [***] of Blackstone's receipt of Alnylam's written notice with respect to such Change of Control in accordance with this Section 3.8. The Executive Officers will promptly confer to discuss such dispute. In the event that the Executive Officers are unable to resolve such dispute within [***] of the date of Alnylam's receipt of Blackstone's written notice under this Section 3.8, then [***]. In the event that, in accordance with the foregoing, it is determined that such Change of Control of Alnylam would have a substantial likelihood of having a Material Impact, Blackstone may within [***] exercise its right to terminate this Agreement under Section 13.3.5, provided that if Blackstone elects to continue this Agreement or does not exercise its right to terminate under Section 13.3.5, this Agreement will remain in full force and effect without modification. In the event that it is determined that such Change of Control by Alnylam would not have a substantial likelihood of having a Material Impact (or Blackstone otherwise does not exercise its right to terminate this Agreement), then this Agreement will remain in full force and effect without modification.

3.9 [***]

ARTICLE 4

DEVELOPMENT COSTS

4.1 Development Costs.

4.1.1 Vutrisiran. Blackstone will pay up to a cap of Seventy Million U.S. Dollars (\$70,000,000) of Development Costs for the HELIOS-B Trial (such costs, the “Vutrisiran Development Costs” and such cap, the “Vutrisiran Maximum Development Costs”) in accordance with the funding schedule set forth in Section 4.3. For clarity, (a) Blackstone will be entitled to invest the Vutrisiran Development Costs (up to the Vutrisiran Maximum Development Costs) in an amount equal to Alnylam’s Development expenses for Vutrisiran during the Development Term for Vutrisiran (which Development expenses will be provided to Blackstone through the JSC), and (b) Alnylam agrees not to use additional funding from a Third Party for the Development of Vutrisiran until the Vutrisiran Maximum Development Costs have been provided to Alnylam by Blackstone. Notwithstanding the foregoing, in the event that the Vutrisiran Development Costs actually exceed the payments made by Blackstone under this Section 4.1.1 (including as a result of certain Development Events not yet having been achieved pursuant to Section 4.3), then Alnylam may use additional funding from a Third Party for the Development of Vutrisiran to cover any such shortfall in funding; provided that, if such shortfall is a result of a Development Event not yet having been achieved, then Alnylam may only seek such Third Party funding for the Development Costs payable under the Funding Tranche corresponding to such Development Event; and provided further, that regardless of whether Alnylam utilizes such Third Party funding, Blackstone will remain entitled to invest an amount up to the Vutrisiran Maximum Development Costs, such that the total amount of Alnylam’s Development expenses for Vutrisiran during the Development Term set forth in the foregoing (a) will not be reduced by the amount of such Third Party funding. As between the Parties, any Development Costs in excess of the Vutrisiran Maximum Development Costs will be borne by Alnylam.

4.1.2 ALN-AGT. Subject to Section 4.2, Blackstone will pay up to (a) Twenty-Six Million U.S. Dollars (\$26,000,000) of Development Costs for the ALN-AGT Phase 2 Trial (the “ALN-AGT Phase 2 Development Costs”), and (b) Fifty-Four Million U.S. Dollars (\$54,000,000) for the ALN-AGT Phase 3 Trial (the “ALN-AGT Phase 3 Development Costs”) (together with the ALN-AGT Phase 2 Development Costs, the “ALN-AGT Development Costs,” and the cost caps therein, the “ALN-AGT Maximum Development Costs”) in accordance with the funding schedule set forth in Section 4.3. For clarity, (i) Blackstone will be entitled to invest the ALN-AGT Development Costs (up to the ALN-AGT Maximum Development Costs) in an amount equal to Alnylam’s Development expenses for ALN-AGT during the Development Term for ALN-AGT (which Development expenses will be provided to Blackstone through the JSC), and (ii) Alnylam agrees not to use additional funding from a Third Party for the Development of ALN-AGT until the ALN-AGT Maximum Development Costs have been provided to Alnylam by Blackstone. Notwithstanding the foregoing, in the event that the ALN-AGT Development Costs actually

exceed the payments made by Blackstone under this Section 4.1.2 (including as a result of certain Development Events not yet having been achieved pursuant to Section 4.3), then Alnylam may use additional funding from a Third Party for the Development of ALN-AGT to cover any such shortfall in funding; provided that, if such shortfall is a result of a Development Event not yet having been achieved, then Alnylam may only seek such Third Party funding for the Development Costs payable under the Funding Tranche corresponding to such Development Event; and provided further, that regardless of whether Alnylam utilizes such Third Party funding, Blackstone will remain entitled to invest an amount up to the ALN-AGT Maximum Development Costs, such that the total amount of Alnylam's Development expenses for ALN-AGT during the Development Term set forth in the foregoing (i) will not be reduced by the amount of such Third Party funding. As between the Parties, any Development Costs in excess of the ALN-AGT Maximum Development Costs will be borne by Alnylam.

4.2 Contingent Nature of Obligation to Fund ALN-AGT Development Costs.

4.2.1 ALN-AGT Phase 2 Development Costs. Blackstone will have no obligation to pay to Alnylam the ALN-AGT Phase 2 Development Costs unless and until (a) the completion of a Phase 1 Clinical Trial for ALN-AGT (or a sufficient portion thereof) that the Parties mutually agree is supportive of the advancement of ALN-AGT into a Phase 2 Clinical Trial, and (b) Blackstone's final determination that the Phase 1 Success Criteria for such Phase 1 Clinical Trial for ALN-AGT have been met. In the event that the Parties are unable to so agree on whether such Phase 1 Clinical Trial is supportive of advancement, or Blackstone determines that the success criteria for such Phase 1 Clinical Trial have not been met, then Alnylam may, in its sole discretion, determine to proceed with the ALN-AGT Phase 2 Trial. Notwithstanding the foregoing, and for the avoidance of doubt, Blackstone will have the right, but will have no obligation to, pay the ALN-AGT Phase 2 Development Costs in support of such ALN-AGT Phase 2 Trial.

4.2.2 ALN-AGT Phase 3 Development Costs. Following (a) the completion of the ALN-AGT Phase 2 Trial, and (b) the JSC's final determination that the Phase 2 Success Criteria for the ALN-AGT Phase 2 Trial have been met, Blackstone will have the right (but not the obligation) to fund the ALN-AGT Phase 3 Development Costs. In the event that the JSC determines that the Phase 2 Success Criteria for such ALN-AGT Phase 2 Trial have not been met (or the Parties cannot agree that the Phase 2 Success Criteria have been met), then Alnylam may, in its sole discretion, determine to proceed with the ALN-AGT Phase 3 Trial. Notwithstanding the foregoing, and for the avoidance of doubt, (x) Blackstone will have the right, but will have no obligation to, pay the ALN-AGT Phase 3 Development Costs in support of such ALN-AGT Phase 3 Trial, and (y) upon achievement of the ALN-AGT Phase 2 Success Payment Trigger, regardless of whether Blackstone pays the ALN-AGT Phase 3 Development Costs, Blackstone will still be entitled to receive the ALN-AGT Phase 2 Success Payments in accordance with the payment schedule set forth in Section 6.1.2.1 without delay.

4.3 Funding Schedule.

4.3.1 Vutrisiran. Blackstone will pay the Vutrisiran Development Costs to Alnylam in Funding Tranches on the basis of Alnylam's achievement of the Development Events set forth on Schedule 4.3(a) until the date on which the Vutrisiran Development Costs reach the Vutrisiran Maximum Development Costs. For clarity, Blackstone will have no obligation to fund any Funding Tranche of the Vutrisiran Development Costs unless and until the corresponding Development Event has been met. With respect to each Funding Tranche, such payments will be made quarterly within [***] following Blackstone's receipt of an invoice from Alnylam for such quarterly payment, which invoice will be issued within [***] following the start of each Calendar Quarter in the foregoing time period..

4.3.2 ALN-AGT. Blackstone will pay the ALN-AGT Development Costs to Alnylam in Funding Tranches on the basis of Alnylam's achievement of the Development Events set forth on Schedule 4.3(b) hereto (a) with respect to the ALN-AGT Phase 2 Development Costs, until the conclusion of the ALN-AGT Phase 2 Trial (subject to the applicable ALN-AGT Maximum Development Costs), and (b) with respect to the ALN-AGT Phase 3 Development Costs, until the conclusion of the ALN-AGT Phase 3 Trial (subject to the applicable ALN-AGT Maximum Development Costs). For clarity, Blackstone will have no obligation to fund any Funding Tranche of the Vutrisiran Development Costs unless and until the corresponding Development Event has been met. With respect to each Funding Tranche, such payments will be made quarterly within forty-five (45) days following Blackstone's receipt of an invoice from Alnylam for such quarterly payment, which invoice will be issued within ten (10) days following the start of each Calendar Quarter in the foregoing time periods.

4.4 Use of Proceeds. Alnylam will use the (a) Vutrisiran Development Costs provided by Blackstone pursuant to Section 4.1 solely for the purposes of funding the Development and pre-Commercialization costs of Vutrisiran, and (b) ALN-AGT Development Costs provided by Blackstone pursuant to Section 4.1 solely for the purposes of funding the Development and pre-Commercialization costs of ALN-AGT.

4.5 Development Costs Account. The Vutrisiran Development Costs and the ALN-AGT Development Costs will be funded into, and will be disbursed from, the Development Costs Account. Alnylam hereby grants a continuing first-priority security interest in the Development Costs Account to Blackstone to secure payment of the Alnylam Obligations. Proceeds remaining in the Development Costs Account at any time after which the Clinical Trials for each Development Program have been either completed or terminated (as applicable) will be re-funded to Blackstone.

ARTICLE 5

GOVERNANCE

5.1 Joint Steering Committee.

5.1.1 Representatives. Within [***] after the Effective Date, the Parties will establish a joint steering committee to oversee and manage the collaboration (the “JSC”). Each Party initially will appoint [***] representatives to serve as representatives to the JSC (the “JSC Representatives”), with each JSC Representative having knowledge and expertise regarding developing products similar to the Products and sufficient decision-making authority within the applicable Party to make decisions on behalf of such Party within the scope of the JSC’s decision-making authority and, if any such representative is not an employee of the appointing Party, such representative will execute a confidentiality agreement in form and substance acceptable to the other Party (and, for the avoidance of doubt, the appointing Party will remain responsible to the other Party for any noncompliance by such representative with such confidentiality obligations). Each Party may replace its JSC Representatives at any time upon written notice to the other Party.

5.1.2 Chairperson. The JSC chairperson (“JSC Chairperson”) will be designated by Alnylam from Alnylam’s JSC Representatives. The JSC Chairperson will coordinate with the Alnylam Alliance Manager for drafting and circulating the draft agenda and ensuring minutes are prepared, as may be appropriate.

5.1.3 Meetings. From the Effective Date until, on a Product-by-Product basis, the first quarter after the date on which such Product has obtained Regulatory Approval (which Regulatory Approval is for the Approval Indication with respect to Vutrisiran) in the U.S. and at least three additional Major Market Countries, (after which time, the JSC will be dissolved with respect to such Product or, after the second Product has met such criteria, will be dissolved in its entirety), the JSC will meet at least twice per Calendar Year (and for clarity, such meetings are intended to be conducted via teleconference or videoconference) unless the Parties mutually agree otherwise. In the event that [***] either Party may call a special meeting of the JSC (by videoconference or teleconference) during the Development Term by providing at least [***] prior written notice to the other Party, which notice will include a reasonably detailed description of the purpose of such meeting.

5.1.4 Participants. The JSC may invite individuals who are not JSC Representatives to participate in JSC meetings; provided that (a) all JSC Representatives of both Parties consent to such non-member’s participation; and (b) such non-member has executed a confidentiality agreement in form and substance acceptable to the non-inviting Party (and, for the avoidance of doubt, the inviting Party will remain responsible to the non-inviting Party for any noncompliance by such individual with such confidentiality obligations). For clarity, such non-members will have no voting rights at the JSC.

5.1.5 Alliance Managers. Each Party will appoint an individual to act as an alliance manager for such Party (each, an “Alliance Manager”) by providing the name and contact information for the Alliance Manager to the JSC. Each Party may change its Alliance Manager from time to time in its sole discretion upon written notice to the JSC. The Alliance Managers will be the primary point of contact for the Parties regarding the activities contemplated by the Agreement, and the Parties will use reasonable efforts to ensure that any requests for information and data made outside of the JSC are made through the Alliance Managers. The Alliance Managers will attend all meetings of the JSC, and coordinate the exchange of information with regard to any of Blackstone’s reasonable questions about the HELIOS-B Protocol, the Protocols for Product Clinical Trials for ALN-AGT and the Products, which may be addressed at such meetings of the JSC, as appropriate. For clarity, the Alliance Managers may also be members of the JSC, but will remain in place for the duration of the Term, regardless of whether the JSC is dissolved pursuant to Section 5.1.3.

5.1.6 Costs. Each Party will bear its own expenses relating to the meetings and activities of the JSC.

5.2 JSC Responsibilities and Decision-Making.

5.2.1 Responsibilities (Review and Discuss). The JSC’s responsibilities will include reviewing and discussing (but not approving) the following at regularly scheduled meetings:

5.2.1.1 the progress of the Development Programs and the overall Regulatory Approval and Commercialization strategies for the Products;

5.2.1.2 material changes in the Development Programs, including material changes required by, or made to respond to comments from, a Regulatory Authority;

5.2.1.3 the Development Costs incurred in connection with, the Development Programs;

5.2.1.4 a material change to a Protocol, including (a) a material change to the statistical analysis plan attached hereto as Exhibit G, (b) a material reduction of the statistical powering of a Product Clinical Trial as set forth in the Protocol for such Product Clinical Trial, or (c) any material change to the inclusion criteria or exclusion criteria with respect to a Product Clinical Trial as set forth in the applicable Protocol;

5.2.1.5 the substitution or addition of any arms in any Product Clinical Trial;

5.2.1.6 material changes or revisions to the Timeline for the Product Clinical Trials;

5.2.1.7 Licensing Transactions between Alnylam and a Third Party that could materially impact Alnylam's ability to make the Success Payments in accordance with Section 3.7;

5.2.1.8 the addition to the Development Program of any new Clinical Trials testing the efficacy of a Product; and

5.2.1.9 any other matters the Parties mutually agree in writing will be, or are expressly provided in this Agreement to be, reviewed and discussed by the JSC.

5.2.2 Responsibilities (Review and Approve). The JSC's responsibilities will include reviewing and approving the following:

5.2.2.1 changes to the funding schedule set forth in Section 4.3 for either Vutrisiran or ALN-AGT;

5.2.2.2 the determination as to whether the Phase 2 Success Criteria or the Phase 3 Success Criteria have been achieved; or

5.2.2.3 any other matters that the Parties mutually agree in writing will be, or are expressly provided in this Agreement to be, reviewed and approved by the JSC.

5.2.3 Limitation on Authority. Notwithstanding anything to the contrary set forth in this Agreement, the JSC will have no authority to (a) amend, modify or waive compliance with this Agreement, or (b) resolve any dispute concerning the validity, interpretation, construction of, or breach of this Agreement.

5.2.4 Decision-Making. Alnylam will retain sole decision-making authority over (a) [***] and (b) [***] except, in each case of (a) and (b), other than the matters described in Section 5.2.2. The unanimous approval of the JSC will be required with respect to all matters within its decision-making authority as described in the foregoing Section 5.2.2. The JSC Representatives of each Party will collectively have one (1) vote. The presence of at least one of each Party's JSC representatives constitutes a quorum for the conduct of business at any JSC meeting, and no vote of the JSC may be taken without a quorum present. If the Parties are unable to reach agreement with regard to any of the matters set forth in Section 5.2.2, then, the matter will be escalated to the Executive Officers for attempted resolution by good faith negotiations during a period of [***] or as may be extended by mutual agreement of the Parties. If, notwithstanding such good faith negotiations, the Executive Officers fail to resolve such matter prior to expiration of such [***] negotiation period, as may be extended in accordance with the foregoing sentence, with

respect to a Dispute as to Sections 5.2.2.2 or 5.2.2.3 only, either Party may initiate an arbitration with respect to such Dispute after expiration of such [***] negotiation period, in accordance with Section 14.10.2. For the avoidance of doubt, neither party will be permitted to initiate an arbitration hereunder with respect to a Dispute as to matters within Section 5.2.2.1.

5.3 Reports.

5.3.1 Provided to the JSC. At each JSC meeting Alnylam will provide an update and overview on the progress of the Product Clinical Trials and will report generally on progress toward obtaining Regulatory Approvals in each Major Market Country. As applicable, such update and overview will address matters that are subject to review and discussion of the JSC pursuant to Section 5.2.1, and Alnylam shall promptly provide to the JSC, prior to any JSC meeting at which the JSC is scheduled to discuss whether the Success Criteria under sub-sections 1.1.145, 1.1.147 or 1.1.149 have been met, those background materials that Blackstone identifies as reasonably necessary for it to adjudicate such Success Criteria and its decision to fund ALN-AGT Development Costs. For clarity, Alnylam shall not be required to prepare any new substantive written materials for the JSC meeting beyond the written materials that Alnylam is obligated to disclose to Blackstone pursuant to Section 3.6.

5.3.2 Following JSC Dissolution with Respect to Vutrisiran. Following the dissolution of the JSC with respect to Vutrisiran (as set forth in Section 5.1.3), Alnylam will provide, on an annual basis, [***]. In addition, following such dissolution of the JSC, no less than annually, the Alliance Managers will discuss any material updates to the prosecution and enforcement of the Alnylam Intellectual Property, the manufacturing and Commercialization of Vutrisiran, or any other material updates that could reasonably be expected to impact Alnylam's obligation to pay the Royalty to Blackstone.

ARTICLE 6

PAYMENTS TO BLACKSTONE

6.1 Success Payments; Royalty.

6.1.1 Vutrisiran.

6.1.1.1 Success Payments. Following Regulatory Approval of Vutrisiran for the Approval Indication in the first Major Market Country (the "Vutrisiran Success Payment Trigger"), Alnylam will pay to Blackstone (subject to adjustment pursuant to Section 6.2) a payment equal to [***] following the end of the Calendar Quarter in which the Vutrisiran Success Payment Trigger occurs, in accordance with Section 6.3.1. Thereafter, if and only if the conditions precedent set forth in Section 6.1.1.3(ii) below are met on the applicable payment date, Alnylam will make [***] (subject to Section 6.2.1.2) additional [***] payments of [***] until the second (2nd) anniversary of the Vutrisiran Success Payment Trigger, for a total

(including the initial payment above) of One-Hundred and Seventy-Five Million U.S. Dollars (\$175,000,000) (subject to adjustment pursuant to Section 6.2) in accordance with Section 6.3.1 (all payments under this Section 6.1.1.1, the “Vutrisiran Success Payments”).

6.1.1.2 Royalty. Alnylam will pay to Blackstone, on a country-by-country basis, a one percent (1%) royalty on the aggregate Net Sales of Vutrisiran in any indication sold by Alnylam, its Affiliates or its sublicensees, in such country during the Royalty Term (the “Royalty”). For the avoidance of doubt, (a) the Royalty (and the calculation of Net Sales) will not be subject to any offset, deduction or step-down of any kind, and will be calculated without taking into account any payments owed to Third Parties under subclause (b) of this Section 6.1.1.2, and (b) Alnylam will bear one hundred percent (100%) of any amounts paid or payable to Third Parties (including, but not limited to, milestone payments, royalty payments, sublicensing fees, license maintenance fees, etc.) as of the Effective Date or at any time during the Term under the Existing Licenses or any future agreement entered into with a Third Party related to Vutrisiran.

6.1.1.3 Contingent Payments; Conditions Precedent.

(i) Failure to Achieve Success Payment Trigger. Subject to the termination rights set forth in Section 13.3, in the event that the Vutrisiran Success Payment Trigger is not met, but Alnylam has materially performed its obligations under this Agreement (including, without limitation, its obligation to use Commercially Reasonable Efforts as set forth in Section 3.2.2), then Alnylam will not be obligated to pay the Vutrisiran Success Payments or Royalty to Blackstone (or any other payments hereunder to Blackstone with respect to Vutrisiran).

(ii) Conditions Precedent. Alnylam’s obligation to pay to Blackstone each Vutrisiran Success Payment set forth in Section 6.1.1.1 above following the initial Success Payment of [***] (subject to adjustment pursuant to Section 6.2) will only apply if, as of the applicable Vutrisiran Success Payment date, Vutrisiran has not been withdrawn from the market, in its entirety and for all indications, in all Major Market Countries following a Mandatory Recall. In the event that, following the implementation of a Mandatory Recall, [***] or Vutrisiran is re-launched in a Major Market Country, then the Vutrisiran Success Payments will be due and payable by Alnylam to Blackstone in accordance with the payment schedule set forth in Section 6.1.1.1 above, which payment schedule will be extended to account for the length of time during which Vutrisiran was withdrawn from the market; provided that, at the time of such payments for such [***] re-launched Product, the condition set forth in the foregoing sentence is met for such [***] re-launched Product; and provided further, that the amount of such Vutrisiran Success Payments for such [***] re-launched Product will be reduced by the amount of any Vutrisiran Success Payments that were paid to Blackstone prior to such Mandatory Recall.

6.1.2 ALN-AGT Phase 2 Success Payments.

6.1.2.1 Success Payments. Following the earlier of (a) the Parties reasonable determination through the JSC as of the rand DB PCT IA (as such event is defined in the ALN-AGT Development Plan) that the Phase 2 Success Criteria for the ALN-AGT Phase 2 Trial have been met, or (b) Alnylam's (or its designee's) commencement (i.e., first dosing of the first subject) of a Phase 3 Clinical Trial for ALN-AGT ((a) or (b), as applicable, the "ALN-AGT Phase 2 Success Payment Trigger"), Alnylam will pay to Blackstone (subject to adjustment pursuant to Section 6.2) a payment equal to [***] following the end of the Calendar Quarter in which the ALN-AGT Phase 2 Success Payment Trigger occurs, in accordance with Section 6.3.1; provided that, in the event that the ALN-AGT Phase 2 Success Payment Trigger is met on the basis of the foregoing (b), then, following the commencement of such ALN-AGT Phase 3 Trial, Alnylam shall pay the amounts set forth in this Section 6.1.2.1 as if the ALN-AGT Phase 2 Success Trigger had occurred on the date on which the results of the rand DB PCT IA (as such event is defined in the ALN-AGT Development Plan) for the ALN-AGT Phase 2 Trial were available (including, subject to Section 6.1.2.2(ii), the immediate payment to Blackstone of any amounts that would have already been due and payable had the ALN-AGT Phase 2 Success Trigger occurred upon such date). Thereafter, if and only if the conditions precedent set forth in Section 6.1.2.2(ii) below are met on the applicable payment date, Alnylam will make [***] (subject to Section 6.2.2.2 and subject to any catch-up payments required by the proviso in the immediately preceding sentence) additional [***] payments of [***] until the fourth (4th) anniversary of the ALN-AGT Phase 2 Success Payment Trigger for a total (including the initial payment above) of Eighty-Four Million, Five-Hundred Thousand U.S. Dollars (\$84,500,000) (subject to adjustment pursuant to Section 6.2) in accordance with Section 6.3.1 (all payments under this Section 6.1.2.1, the "ALN-AGT Phase 2 Success Payments").

6.1.2.2 Contingent Payments; Conditions Precedent.

(i) Failure to Achieve Success Criteria. In the event that Alnylam has materially performed its obligations under this Agreement (including its obligation to use Commercially Reasonable Efforts as set forth in Section 3.2.2), but the ALN-AGT Phase 2 Success Payment Trigger is not met, then Alnylam will not be obligated to pay the ALN-AGT Phase 2 Success Payments to Blackstone (or any other payments hereunder to Blackstone with respect to ALN-AGT). For the avoidance of doubt, in the event that the ALN-AGT Phase 2 Success Payment Trigger is met, but the ALN-AGT Phase 3 Success Payment Trigger is not met during the Term, then, Alnylam will only be obligated to pay to Blackstone the ALN-AGT Phase 2 Success Payments, subject to Section 6.1.2.2(ii).

(ii) Conditions Precedent. Alnylam's obligation to pay to Blackstone each ALN-AGT Phase 2 Success Payment set forth in Section 6.1.2.1 above

following the initial ALN-AGT Phase 2 Success Payment of [***] (subject to adjustment pursuant to Section 6.2) will only apply if, as of the applicable ALN-AGT Phase 2 Success Payment date, (A) Alnylam has not discontinued the ALN-AGT Development Program in its entirety in all Major Market Countries following the issuance of a Clinical Hold resulting from a SUSAR, and (B) [***]. In the event that, following the discontinuation of the ALN-AGT Development Program, [***] or the Development Program for the Existing ALN-AGT Product is recommenced in a Major Market Country, and such Existing ALN-AGT Product [***] achieves the Phase 2 Success Criteria, then the ALN-AGT Phase 2 Success Payments will be due and payable by Alnylam to Blackstone in accordance with the payment schedule set forth in Section 6.1.2.1 above, which payment schedule will be extended to account for the length of time during which Alnylam was not Developing the Existing ALN-AGT Product [***] provided that, at the time of such payments for such [***] re-launched Product, the conditions set forth in the foregoing sentence are met for such [***] re-launched Product; and provided further, that the amount of such ALN-AGT Phase 2 Success Payments for such ALN-AGT Back-Up Product or re-launched Product will be reduced by the amount of any ALN-AGT Phase 2 Success Payments that were paid to Blackstone prior to Alnylam's discontinuation of the ALN-AGT Development Program.

6.1.3 ALN-AGT Phase 3 Success Payments.

6.1.3.1 Success Payments. Following Regulatory Approval of ALN-AGT in the first Major Market Country (the "ALN-AGT Phase 3 Success Payment Trigger"), Alnylam will pay to Blackstone (subject to adjustment pursuant to Section 6.2) a payment equal to [***] following the end of the Calendar Quarter in which the ALN-AGT Phase 3 Success Payment Trigger occurs, in accordance with Section 6.3.1. Thereafter, if and only if the conditions precedent set forth in Section 6.1.3.2(ii) below are met on the applicable payment date, Alnylam will make [***] (subject to Section 6.2.3.2) additional [***] payments of [***] until the fourth (4th) anniversary of the ALN-AGT Phase 3 Success Payment Trigger, for a total (including the initial payment above) of Two-Hundred and Forty-Three Million U.S. Dollars (\$243,000,000) (subject to adjustment pursuant to Section 6.2) in accordance with Section 6.3.1 (all payments under this Section 6.1.3.1, the "ALN-AGT Phase 3 Success Payments").

6.1.3.2 Contingent Payments; Conditions Precedent.

(i) Failure to Achieve ALN-AGT Phase 3 Success Payment Trigger. Subject to the termination rights set forth in Section 13.3, in the event that Alnylam has performed its obligations under this Agreement (including its obligation to use Commercially Reasonable Efforts as set forth in Section 3.2.2), but the ALN-AGT Phase 3 Success Payment Trigger is not met, then Alnylam will not be obligated to pay the ALN-AGT Phase 3 Success Payments to Blackstone.

(ii) Conditions Precedent. Alnylam's obligation to pay to Blackstone each ALN-AGT Phase 3 Success Payment set forth in Section 6.1.3.1 above following the initial Success Payment of [***] (subject to adjustment pursuant to Section 6.2) will only apply if, as of the applicable Success Payment date, ALN-AGT has not been withdrawn from the market, in its entirety and for all indications, in all Major Market Countries following a Mandatory Recall. In the event that, following the implementation of a Mandatory Recall [***] or ALN-AGT is re-launched in a Major Market Country, then Alnylam will resume its payment of the ALN-AGT Phase 3 Success Payments to Blackstone in accordance with the payment schedule set forth in Section 6.1.3.1 above, which payment schedule will be extended to account for the length of time during which ALN-AGT was withdrawn from the market; provided that, at the time of such payments for such [***] re-launched Product, the condition set forth in the foregoing sentence is met for such [***] re-launched Product; and provided further, that the amount of such ALN-AGT Phase 3 Success Payments for such [***] re-launched Product will be reduced by the amount of any ALN-AGT Phase 3 Success Payments that were paid to Blackstone prior to such Mandatory Recall.

6.2 Payment Adjustments.

6.2.1 Vutrisiran.

6.2.1.1 Adjustment for Change in Development Costs. In the event that the actual Vutrisiran Development Costs paid by Blackstone hereunder are lower or greater than Seventy Million U.S. Dollars (\$70,000,000), then the Vutrisiran Success Payments will be adjusted to reflect the applicable MoIC multiplied by the actual Vutrisiran Development Costs paid by Blackstone hereunder. By way of example, if the actual Vutrisiran Development Costs equal Sixty-Five Million U.S. Dollars (\$65,000,000), then the Vutrisiran Success Payments would be equal to $\$65,000,000 \times 2.5 = \$162,500,000$.

6.2.1.2 Adjustment for Regulatory Delay. In the event that the Vutrisiran Success Payment Trigger has not been achieved by [***] (the "Vutrisiran Approval Target"), then, unless such delay is caused by a Force Majeure Event, following the Vutrisiran Success Payment Trigger, the Vutrisiran Success Payments will be adjusted as follows [***].

6.2.2 ALN-AGT Phase 2 Success Payments.

6.2.2.1 Adjustment for Change in Development Costs. In the event that the actual ALN-AGT Phase 2 Development Costs paid by Blackstone hereunder are lower or greater than Twenty-Six Million U.S. Dollars (\$26,000,000), then the ALN-AGT Phase 2 Success Payments will be adjusted to reflect the applicable MoIC multiplied by the actual ALN-AGT Phase 2 Development Costs paid by Blackstone hereunder. By way of example, if the actual ALN-AGT Phase 2

Development Costs equal Twenty Million U.S. Dollars (\$20,000,000), then the ALN-AGT Phase 2 Success Payments would be equal to $\$20,000,000 \times 3.25 = \$65,000,000$.

6.2.2.2 Adjustment for Phase 2 Success Delay. Following completion of the ALN-AGT Phase 1 Clinical Trial but prior to Blackstone commencing to pay the ALN-AGT Phase 2 Development Costs, the estimated date for the receipt of the results of the rand DB PCT IA (as such event is defined in the ALN-AGT Development Plan) for such ALN-AGT Phase 2 Trial (such estimated completion date, the “ALN-AGT Phase 2 Success Target”) will be finalized by the Parties and the Timeline will be amended to include such date. In the event that the ALN-AGT Phase 2 Success Payment Trigger has not been achieved by the ALN-AGT Phase 2 Success Target, then, unless such delay is caused by a Force Majeure Event, following the ALN-AGT Phase 2 Success Payment Trigger, the ALN-AGT Phase 2 Success Payments will be adjusted as follows [***].

6.2.3 ALN-AGT Phase 3 Success Payments.

6.2.3.1 Adjustment for Change in Development Costs. In the event that the actual ALN-AGT Phase 3 Development Costs paid by Blackstone hereunder are lower or greater than Fifty-Four Million U.S. Dollars (\$54,000,000), then the ALN-AGT Phase 3 Success Payments will be adjusted to reflect the applicable MoIC multiplied by the actual ALN-AGT Phase 3 Development Costs paid by Blackstone hereunder. By way of example, if the actual ALN-AGT Phase 3 Development Costs equal Fifty Million U.S. Dollars (\$50,000,000), then the ALN-AGT Phase 3 Success Payments would be equal to $\$50,000,000 \times 4.5 = \$225,000,000$.

6.2.3.2 Adjustment for Approval Delay. Following completion of the ALN-AGT Phase 2 Clinical Trial, but prior to Blackstone commencing to pay the ALN-AGT Phase 3 Development Costs, the estimated date for the first Regulatory Approval of ALN-AGT (the “ALN-AGT Phase 3 Approval Target”) will be finalized by the Parties and the Timeline will be amended to include such date. In the event that the ALN-AGT Phase 3 Success Payment Trigger has not been achieved by the ALN-AGT Phase 3 Approval Target, then, unless such delay is caused by a Force Majeure Event, following the ALN-AGT Phase 3 Success Payment Trigger, the ALN-AGT Phase 3 Success Payments will be adjusted as follows [***].

6.3 Method and Timing of Payment.

6.3.1 Success Payments. Commencing upon the date of the applicable Success Payment Trigger, Blackstone (or its designee) will deliver invoices to Alnylam for each applicable Success Payment within [***]. Alnylam will pay the amount set forth on each such invoice within [***] following delivery of such invoice, by wire transfer to Blackstone's account that Blackstone will designate on such invoice. Alnylam will provide Blackstone with written notice of each wire transfer to Blackstone's account. All amounts payable and calculations under this Agreement will be in U.S. dollars.

6.3.2 Royalty Reports; Payments. During the Royalty Term for Vutrisiran, within [***] after the end of each Calendar Quarter, Alnylam will deliver a report to Blackstone (or its designee) specifying on a currency-by-currency basis (a) gross sales in the relevant Calendar Quarter, (b) Net Sales in the relevant Calendar Quarter (including a description (and amount) of any deductions applied in determining the gross sales to Net Sales calculation), (c) to the extent that such Net Sales includes sales not denoted in U.S. Dollars, Alnylam's exchange rate methodology shall be in accordance with GAAP, and (d) the Royalty payable on such Net Sales. All Royalty payments due under Section 6.1.1.2 for each Calendar Quarter will be due and payable on the date that such royalty report is due. In the event that, during the Royalty Term for Vutrisiran, [***].

6.4 Late Payments. If Alnylam fails to pay any amount due under this Agreement on the due date therefore, then, without prejudice to any other remedies that Blackstone or its designee may have, such amount will bear interest from the due date until payment of such amount is made, both before and after any judgment, at a rate equal to [***] per annum, computed on the basis of a year of three-hundred and sixty-five (365) days for the actual number of days payment is delinquent, or if such rate exceeds the maximum amount permitted by Applicable Law, at such maximum rate.

6.5 Taxes.

6.5.1 Tax Treatment. For all U.S. federal and applicable state and local tax purposes, the Parties shall treat (i) Blackstone's payment of any Development Costs (pursuant to Article 4) as received by Alnylam as income in a taxable transaction, (ii) Alnylam's payment of any Success Payments and Royalty payments (pursuant to this Article 6) as received by Blackstone in a taxable transaction, (iii) the transactions contemplated under this Agreement as separate and independent from any transactions entered into by Alnylam and Blackstone or their Affiliates other than those contemplated by this Agreement, and (iv) Alnylam's payment of any Success Payments and Royalty payments (as set forth in Article 6) as income from sources within the United States as defined under the Code and the Treasury Regulations thereunder. If there is an inquiry by any Governmental Authority related to this Section 6.5, the Parties shall cooperate with each other in responding to such inquiry in a commercially reasonable manner consistent with this Section 6.5.

6.5.2 Withholding.

6.5.2.1 To the extent a Party making a payment under this Agreement (the “Paying Party”) is required by Applicable Law to deduct or withhold taxes on any payment to the Party receiving such payment (the “Recipient Party”), the Paying Party will be entitled to make such deduction or withholding. Prior to deducting and withholding any amounts, the Paying Party shall notify the Recipient Party of such deduction or withholding and cooperate with the Recipient Party as provided in Section 6.5.3. If, notwithstanding such cooperation, the deduction or withholding is not eliminated, then the Paying Party shall pay the amounts of such taxes to the proper Governmental Authority in a timely manner and promptly transmit to the Recipient Party a copy of a tax certificate or other evidence of such deduction or withholding sufficient to enable the Recipient Party to claim such payment of taxes or for a refund claim to the extent available under the Applicable Law, as applicable. Notwithstanding anything to the contrary in this Agreement, the Parties agree that no deduction or withholding shall be made by Paying Party to the extent the Recipient Party has timely delivered to the Paying Party a duly completed IRS Form W-9, except to the extent such deduction or withholding is required as a result of a change in Applicable Law after the Effective Date.

6.5.2.2 If, as a result of a Withholding Action by the Paying Party (including any assignee or successor), a deduction or withholding is required by Applicable Law and the amount of such deduction or withholding exceeds the amount of deduction or withholding that would have been required if the Paying Party had not committed the Withholding Action, then the Paying Party shall pay an additional amount to the Recipient Party such that, after withholding from the payment contemplated by this Agreement and such additional amount, the Recipient Party receives the same amount as it would have received from the Paying Party absent such Withholding Action by the Paying Party. For the avoidance of doubt, if as a result of a Withholding Action by a Recipient Party the amount of deduction or withholding under the law of the applicable jurisdiction exceeds the amount of such deduction or withholding that would have been required in the absence of such Withholding Action by the Recipient Party, the Paying Party shall be required to pay any additional amount only to the extent that the Paying Party would be required to pay any additional amount to the Recipient Party pursuant to the preceding sentence if the Recipient Party had not committed such Withholding Action. For purposes of this Section 6.5.2.2, “Withholding Action” by a Party means (i) a permitted assignment or sublicense of this Agreement (in whole or in part) by such Party to an Affiliate or a Third Party outside of the Party’s jurisdiction; (ii) the exercise by such Party of its rights under this Agreement (in whole or in part) through an Affiliate or Third Party outside of the Party’s jurisdiction (or the direct exercise of such rights by an Affiliate of such Party outside of the Party’s jurisdiction); (iii) a redomiciliation

of such Party, an assignee or a successor to a jurisdiction outside the applicable jurisdiction of the Party, an assignee or a successor; and (iv) any action taken after the Effective Date by such Party that causes this Agreement or any payment contemplated by this Agreement to become subject to tax (including by virtue of withholding or deduction) in one or more additional jurisdictions after the Effective Date.

6.5.3 Tax Cooperation. The Parties will cooperate and produce on a timely basis any tax forms or reports reasonably requested by the other Party in connection with any payment made under this Agreement, including any tax forms that may be reasonably necessary in order for such Party not to withhold tax or to withhold tax at a reduced rate under an applicable bilateral income tax treaty, including any IRS Forms W-9 or W-8BEN-E, as applicable. Each Party will provide, upon request, to the other Party such tax forms at least thirty (30) days prior to the due date for any such payments; provided that the request for such forms was made in a timely manner. Each Party will provide the other with commercially reasonable assistance to enable the recovery, as permitted by law, of withholding taxes, VAT, or similar obligations resulting from payments made under this Agreement, such recovery to be for the benefit of the Party bearing such withholding tax or VAT. Each Party will provide commercially reasonable cooperation to the other Party, at the other Party's expense, in connection with any official or unofficial tax audit or contest relating to tax payments made with respect to amounts paid or payable to such other Party under this Agreement.

6.5.4 Reporting. The parties hereto agree not to take any position that is inconsistent with the provisions of this Section 6.5 and Section 14.13 on any tax return or in any audit or other judicial or administrative proceeding unless otherwise required pursuant to a "determination" under Section 1313 of the Code or in connection with a settlement.

6.6 Accelerated Payment Option.

6.6.1 Success Payment Acceleration.

6.6.1.1 Alnylam will have the right, in its sole discretion (subject to the Parties reaching agreement as set forth in Section 6.6.1.2), at any time following the achievement of a Success Payment Trigger, to accelerate the payment schedule for the applicable Success Payments.

6.6.1.2 In the event that Alnylam elects to accelerate the Success Payments for Vutrisiran or ALN-AGT in accordance with Section 6.6.1, then Alnylam will provide written notice to Blackstone of such election, and the Parties will mutually agree upon a new accelerated payment schedule for the applicable Success Payments. In the event that the Parties are unable to agree on a new accelerated payment schedule for the applicable Success Payments within [***] of Blackstone's receipt of Alnylam's notice in the foregoing sentence, then the

matter will be escalated to the Executive Officers for attempted resolution by good faith negotiations during a period of [***]. If, notwithstanding such good faith negotiations, the Executive Officers fail to resolve such matter prior to expiration of such [***] negotiation period, then the payment schedule set forth in Section 6.1 will remain in place unless and until the Parties reach mutual agreement.

6.6.2 Royalty Buy-Out. Alnylam will have the right, at any time following the achievement of the Vutrisiran Success Payment Trigger until the conclusion of the Royalty Term, to notify Blackstone that Alnylam wishes to repurchase from Blackstone the right to receive the Royalty. Following Blackstone's receipt of such notice from Alnylam, Blackstone may elect, in its sole discretion, to negotiate with Alnylam in good faith a purchase price for the Royalty. For the avoidance of doubt, Blackstone will have no obligation to sell to Alnylam its interest in the Royalty.

ARTICLE 7

SECURITY INTERESTS

7.1 Security Interest.

7.1.1 Grant. As security for the payment and performance in full when due of the Alnylam Obligations, Alnylam hereby grants to the Administrative Agent for the benefit of the Secured Parties, effective upon the Effective Date, a security interest in (i) the ALN-AGT Collateral, (ii) Vutrisiran Collateral, and (iii) the Development Costs Account; provided, however, that Blackstone's Security Interests with respect to Shared IP is subject to the license granted to the Lenders (as such term is defined in the Term Loan Agreement) in and to such Shared IP under the Term Loan Agreement.

7.1.2 Priority of Security Interest. Alnylam represents, warrants and covenants that, subject to Administrative Agent's making and maintaining any filings necessary to achieve such perfection and the Intercreditor Agreement, (i) the security interests in the Vutrisiran Collateral and the ALN-AGT Collateral are valid and perfected first priority security interests, free and clear of all Liens except for Permitted Liens, and (ii) the security interest in the Development Cost Account will be a valid and perfected, first priority security interest, free and clear of all Liens except for Permitted Liens of the type set forth in clause (d) of the definition thereof ((i) and (ii), the "Blackstone Security Interests"). Alnylam represents and warrants that, as of the Effective Date, Alnylam has not authenticated any agreement authorizing any secured party thereunder to file a financing statement in any Blackstone Collateral, except to perfect Permitted Liens.

7.1.3 Acceleration of Success Payments Following Payment Default. Following the achievement of the first Success Payment Trigger, if Alnylam has failed to pay to Blackstone two (2) successive Success Payments at any time on the applicable payment due date, then unless Alnylam has cured such second (2nd) payment breach within [***] of

such due date, the Administrative Agent, in its sole discretion, may, without prejudice to any other remedies that Blackstone or its designee may have, accelerate all remaining Success Payments for which the Success Payment Triggers have been met, which Success Payments shall be immediately due and payable. For clarity, in the event that, following a second (2nd) missed payment, Alnylam cures such payment breach in accordance with the foregoing, then any failure by Alnylam to pay a Success Payment on the applicable payment due date thereafter shall, without an opportunity for Alnylam to cure such payment breach, trigger the Administrative Agent's acceleration right set forth in this Section 7.1.3.

7.1.4 Blackstone Collateral Exclusions. The security interest granted herein the Blackstone Collateral will remain in effect until the earlier of (a) Alnylam, pursuant to Section 6.1.1.3 or 6.1.3.2 (as applicable), shall cease to have any obligation to pay any Success Payments, and (b) all Alnylam Obligations (other than contingent indemnity obligations) have been paid or otherwise satisfied in full in accordance with this Agreement. Upon payment or other satisfaction of all Alnylam Obligations (other than contingent indemnity obligations), the Administrative Agent will, at the sole cost and expense of Alnylam, release its Liens in the Blackstone Collateral and all rights therein will revert to Alnylam.

7.2 Authorization to File Financing Statements. Alnylam hereby authorizes the Administrative Agent to file, on or at any time from time to time after the Effective Date, and, promptly upon the reasonable request of the Administrative Agent, Alnylam will execute and deliver to the Administrative Agent (as applicable), financing statements, amendments to financing statements, continuation financing statements, termination statements, security agreements relating to the Blackstone Collateral constituting intellectual property, notices and other documents and instruments, in form reasonably satisfactory to the Administrative Agent, that are necessary or desirable to perfect and continue perfection, maintain the priority of or provide notice of the Secured Parties' security interest in the Blackstone Collateral and to accomplish the purpose of this Agreement, without notice to Alnylam, in all jurisdictions determined by the Administrative Agent to be necessary or appropriate.

7.3 Negative Covenants.

7.3.1 Encumbrances. Except as permitted under Section 3.7, Alnylam will not, without the Administrative Agent's prior written consent:

7.3.1.1 create, incur, assume, allow, or suffer to exist any Lien on any of the Blackstone Collateral, whether now owned or hereafter acquired, or assign or convey any right to receive income with respect to the Blackstone Collateral (other than royalty and other license fee obligations to licensors thereof in accordance with the applicable license agreement), including the sale of any Blackstone Collateral, or permit any of its subsidiaries to do so, other than Liens in favor of Blackstone and other Permitted Liens; or

7.3.1.2 enter into any agreement, document, instrument or other arrangement (except with or in favor of the Administrative Agent) with any Person which expressly prohibits Alnylam or any subsidiary of Alnylam from assigning, mortgaging, pledging, granting a security interest in the Blackstone Collateral to the Administrative Agent.

7.4 Affirmative Covenants. Alnylam will do all of the following:

7.4.1 Execution of Additional Security Agreements and Other Further Assurances. Alnylam will, upon the reasonable request of the Administrative Agent from time to time hereafter, execute such security agreements, deposit account control agreements, securities account control agreements and other agreements and documents and take such further action, as reasonably required or desired to perfect or continue the perfection of the Blackstone Security Interests or to effect the purposes of this Article 7, including without limitation by taking the following actions:

(a) On or before the Effective Date, Alnylam will execute and deliver to the Administrative Agent such patent and trademark security agreements as the Administrative Agent may reasonably request, on the form set forth hereto as Exhibit E (each an “IP Security Agreement”), and will record such agreements with the U.S. Patent and Trademark Office. Within [***] of the last day of the fiscal quarter during which the Effective Date occurred and each fiscal quarter ending thereafter, Alnylam will notify the Administrative Agent in writing of the creation or acquisition of any Intellectual Property owned by Alnylam that is registered or becomes registered or the subject of an application for registration with the U.S. Patent and Trademark Office, in each case during such fiscal quarter then ended, and to the extent constituting Blackstone Collateral, and will record a further IP Security Agreement (or amendment to an existing IP Security Agreement) in each case in form and substance reasonably acceptable to the Administrative Agent with the U.S. Patent and Trademark Office, and will take such other action as may be necessary or as the Administrative Agent may reasonably request to perfect the Administrative Agent’s security interest in such Intellectual Property, subject to the limitations set forth in clause (d) below. As between Alnylam and its Affiliates, Alnylam owns and will continue to own all Vutrisiran Product IP and ALN-AGT Product IP (other than Regulatory Approvals outside the United States, which may be owned by one or more of Alnylam’s Affiliates). Notwithstanding the foregoing, an Affiliate of Alnylam shall be permitted to own Vutrisiran Product IP or ALN-AGT Product IP provided that (i) such Vutrisiran Product IP or ALN-AGT Product IP shall continue to be part of the Vutrisiran Collateral or ALN-AGT Collateral, as the case may be; and (ii) as a condition precedent to such ownership, such Affiliate agrees in writing with Alnylam and the Secured Parties, in form reasonably satisfactory to the Administrative Agent, to be bound by the obligations of Alnylam contained in Sections 7.1.1, 7.1.2, 7.1.4, 7.2, 7.3 and 7.4 and thereby to grant to the Administrative Agent, for the benefit of the Secured Parties, perfected security interests in the Vutrisiran Product IP or ALN-AGT Product IP owned by such Affiliate (including, with respect to any such Affiliate that is

formed outside the United States, under the law of such Affiliate's jurisdiction of organization, if requested by the Administrative Agent).

(b) On or before the Effective Date, Alnylam will execute and deliver to the Administrative Agent an acknowledgment and consent to the Intercreditor Agreement.

(c) On or before the date that is sixty (60) days following the Effective Date, Alnylam will execute and deliver to the Administrative Agent a springing deposit account control agreement in favor of the Secured Parties with respect to the Development Costs Account in customary form reasonably acceptable to the Administrative Agent (together with any tri-party deposit account control agreement or tri-party securities account control agreement entered into with respect to a successor or additional Development Costs Account, the "Deposit Account Control Agreement"). In addition to and without limiting the foregoing, Alnylam will provide the Administrative Agent with prior written notice before establishing any additional deposit account at or with any bank or financial institution for the purpose of serving as a Development Costs Account pursuant to Section 4.5. For each such successor or additional Development Costs Account that Alnylam at any time proposes to maintain, Alnylam, as a condition precedent to establishing such successor or additional Development Costs Account, will cause the applicable bank or financial institution at or with which such successor or additional Development Costs Account is proposed to be maintained to execute and deliver to the Administrative Agent a tri-party deposit account control agreement or tri-party securities account control agreement in customary form reasonably acceptable to the Administrative Agent to perfect the Secured Parties' first priority security interest in such account.

(d) At the Administrative Agent's request, Alnylam will promptly execute and deliver (or cause any Affiliate owning Blackstone Collateral to execute and deliver) any and all further instruments and documents and take all such other action as the Administrative Agent may reasonably deem necessary or desirable to maintain in favor of the Secured Parties, Liens on the Blackstone Collateral that are duly perfected in accordance with the requirements of all Applicable Laws (to the extent required under this Agreement. Notwithstanding anything to the contrary in this Agreement or any other document, in no event shall Alnylam or its subsidiaries be required to, nor shall the Administrative Agent be authorized to, take any of the following actions (i) execute, deliver or otherwise obtain any agreement, instrument or documents governed by foreign law, (ii) perfect any pledge, security interest by any means other than by (A) filings pursuant to the UCC in the office of the secretary of state (or similar filing office) of the relevant states and jurisdictions, (B) filings with the USPTO, as applicable, with respect to Intellectual Property, and (C) entering into account control agreements pursuant to Section 7.4.1(c) above, or (iii) to take any actions with respect to any assets not located in the United States (including any Intellectual Property registered or applied for in any jurisdiction outside the United States) or enter into any security document governed by the laws of a jurisdiction other than a jurisdiction within the United States.

7.4.2 Licenses Related to ALN-AGT and Vutrisiran.

7.4.2.1 For the purpose of enabling the Administrative Agent to exercise rights and remedies under this Section Article 7 (including in order to take possession of, collect, receive, assemble, process, appropriate, remove, realize upon, sell, assign, license out, convey, transfer or grant options to purchase any ALN-AGT Collateral or Vutrisiran Collateral), subject to the rest of this Section 7.4.2, Alnylam hereby grants to the Administrative Agent, for the benefit of the Secured Parties, an irrevocable (until the last day of the Term and subject to the license carveouts in clauses (A) and (B) below), nonexclusive, assignable license (which license may be exercised only upon an breach or default by Alnylam hereunder (an “Event of Default”), without payment of royalty or other compensation to Alnylam or any Subsidiary thereof), including the right to practice, use, sublicense or otherwise exploit, solely in connection with Vutrisiran or ALN-AGT or other items in the Blackstone Collateral, any Intellectual Property now owned or hereafter acquired by Alnylam or licensed or sublicensed to Alnylam, in each case that is relevant to any of Vutrisiran and ALN-AGT, but excluding any Shared IP and any Vutrisiran Product IP licensed to Alnylam and ALN-AGT Product IP licensed to Alnylam, and wherever the same may be located, and including in such license reasonable access to all media in which any of the licensed items may be recorded or stored and to all computer software and programs used for the compilation or printout thereof to the extent that such non-exclusive license (A) does not violate the express terms of any agreement between Alnylam and a third party with respect to such Intellectual Property existing as of the Effective Date (and such non-exclusive license and access are and will be subject to and subordinate to the terms of any Permitted License (as defined in the Term Loan Agreement as in effect on the date hereof), excluding any Lien incurred under any Permitted Royalty Financing (as defined in the Term Loan Agreement as in effect on the date hereof) entered into by Alnylam after the Effective Date but prior to such Event of Default), or gives such third party any right of acceleration, modification, termination or cancellation therein and (B) is not prohibited by any Applicable Law; provided that such license and sublicenses with respect to Trademarks shall be subject to the maintenance of quality standards with respect to the goods and services on which such Trademarks are used sufficient to preserve the validity of such Trademarks. For clarity, the Administrative Agent may exercise such license solely upon and during the continuation of an Event of Default and solely for the purpose of exercising the remedies in accordance with this Agreement; provided that any license, sublicense or other transaction entered into by the Administrative Agent in accordance with the provisions of this Agreement shall be binding upon Alnylam, notwithstanding any subsequent cure of an Event of Default.

7.4.2.2 For the purpose of enabling the Administrative Agent to exercise rights and remedies under this Section Article 7 (including in order to

take possession of, collect, receive, assemble, process, appropriate, remove, realize upon, sell, assign, license out, convey, transfer or grant options to purchase any ALN-AGT Collateral or Vutrisiran Collateral), subject to the rest of this Section 7.4.2, Alnylam hereby grants to the Administrative Agent, for the benefit of the Secured Parties, an irrevocable (until the last day of the Term and subject to the license carveouts in clauses (A) and (B) below), nonexclusive, assignable license, including the right to practice, use, sublicense or otherwise exploit, (which license may be exercised only upon an Event of Default, without payment of royalty or other compensation to Alnylam or any Subsidiary thereof) under any of the Shared IP owned by Alnylam now or during the term of this Agreement prior to such Event of Default, to research, develop, make, have made, import, export, sell, offer for sale, and otherwise commercialize Vutrisiran and/or ALN-AGT, and including in such license reasonable access to all media in which any of the licensed items may be recorded or stored and to all computer software and programs used for the compilation or printout thereof, in each case to the extent that such non-exclusive license and/or access (A) does not violate the express terms of any agreement between Alnylam and a third party with respect to such Intellectual Property existing as of the Effective Date (and such non-exclusive license and access are and will be subject to and subordinate to the terms of any Permitted License (as defined in the Term Loan Agreement), excluding any Lien incurred under any Permitted Royalty Financing (as defined in the Term Loan Agreement) entered into by Alnylam after the Effective Date but prior to such Event of Default), or gives such third party any right of acceleration, modification, termination or cancellation therein and (B) is not prohibited by any Applicable Law; provided that such license and sublicenses with respect to Trademarks shall be subject to the maintenance of quality standards with respect to the goods and services on which such Trademarks are used sufficient to preserve the validity of such Trademarks. For clarity, the Administrative Agent may exercise such license solely upon and during the continuation of an Event of Default and solely for the purpose of exercising the remedies in accordance with this Agreement; provided that any license, sublicense or other transaction entered into by the Administrative Agent in accordance with the provisions of this Agreement shall be binding upon Alnylam, notwithstanding any subsequent cure of an Event of Default.

7.4.2.3 For the purpose of enabling the Administrative Agent to exercise rights and remedies under this Section Article 7 (including in order to take possession of, collect, receive, assemble, process, appropriate, remove, realize upon, sell, assign, license out, convey, transfer or grant options to purchase any ALN-AGT Collateral or Vutrisiran Collateral), subject to the rest of this Section 7.4.2, Alnylam hereby agrees to grant to the Administrative Agent, for the benefit of the Secured Parties, solely upon an Event of Default but without payment of royalty or other compensation to Alnylam, an irrevocable (until the last day of the Term and subject to the license carveouts in clauses (A) and (B) below), nonexclusive,

assignable license, including the right to practice, use, sublicense or otherwise exploit, under any Vutrisiran Product IP or ALN-AGT Product IP licensed or sublicensed to Alnylam now or during the term of this Agreement prior to such Event of Default, to research, develop, make, have made, import, export, sell, offer for sale, and otherwise commercialize Vutrisiran and/or ALN-AGT, and including in such license reasonable access to all media in which any of the licensed items may be recorded or stored and to all computer software and programs used for the compilation or printout thereof to the extent that such non-exclusive license and/or access (A) does not violate the express terms of any agreement between Alnylam and a third party with respect to such Intellectual Property existing as of the Effective Date (and such non-exclusive license and access are and will be subject to and subordinate to the terms of any Permitted License (as defined in the Term Loan Agreement), excluding any Lien incurred under any Permitted Royalty Financing (as defined in the Term Loan Agreement) entered into by Alnylam after the Effective Date but prior to such Event of Default), or gives such third party any right of acceleration, modification, termination or cancellation therein and (B) is not prohibited by any Applicable Law; provided that such license and sublicenses with respect to Trademarks shall be subject to the maintenance of quality standards with respect to the goods and services on which such Trademarks are used sufficient to preserve the validity of such Trademarks. For clarity, the foregoing license shall not be granted unless and until the occurrence of an Event of Default, and the foregoing license may be exercised solely for the purpose of exercising remedies in accordance with this Agreement; provided that any license, sublicense or other transaction entered into by Blackstone in accordance with the provisions of this Agreement shall be binding upon Alnylam, notwithstanding any subsequent cure of an Event of Default.

7.5 Administrative Agent.

7.5.1 Appointment and Authority.

7.5.1.1 Appointment. Each of the Blackstone Entities hereby irrevocably appoints, designates and authorizes BXLS V BODYGUARD - PCP L.P. to act on its behalf as the Administrative Agent hereunder and under the other Transaction Agreements and authorizes the Administrative Agent to take such actions on its behalf and to exercise such powers as are delegated to the Administrative Agent by the terms hereof or thereof, together with such actions and powers as are reasonably incidental thereto. The provisions of this Section 7.5 are solely for the benefit of the Administrative Agent and the Blackstone Entities, and neither Alnylam nor any of its Affiliates shall have rights as a third party beneficiary of any of such provisions. It is understood and agreed that the use of the term “agent” herein or in any other Transaction Agreements (or any other similar term) with reference to the Administrative Agent is not intended to connote any fiduciary or other implied (or express) obligations arising under agency doctrine of any

Applicable Law. Instead such term is used as a matter of market custom, and is intended to create or reflect only an administrative relationship between contracting parties.

7.5.1.2 Collateral Agent. The Administrative Agent shall also act as the “collateral agent” under the Transaction Agreements, and each of the Blackstone Entities hereby irrevocably appoints and authorizes the Administrative Agent to act as the agent of such Blackstone Entity for purposes of acquiring, holding and enforcing any and all Liens on Blackstone Collateral granted by Alnylam to secure any of Alnylam’s obligations hereunder, together with such powers and discretion as are reasonably incidental thereto. In this connection, the Administrative Agent, as “collateral agent” and any co-agents, sub-agents and attorneys-in-fact appointed by the Administrative Agent pursuant to Section 7.5.5 for purposes of holding or enforcing any Lien on the Blackstone Collateral (or any portion thereof) granted under the Transaction Agreements, or for exercising any rights and remedies thereunder at the direction of the Administrative Agent, shall be entitled to the benefits of all provisions of this Section 7.5 and Article 14 (as though such co-agents, sub-agents and attorneys-in-fact were the “collateral agent” under the Transaction Agreements) as if set forth in full herein with respect thereto. Without limiting the generality of the foregoing, the Blackstone Entities hereby expressly authorize the Administrative Agent to (i) execute any and all documents (including releases) with respect to the Blackstone Collateral (including any intercreditor agreement and any amendment, supplement, modification or joinder with respect thereto) and the rights of any secured party with respect thereto, as contemplated by and in accordance with the provisions of this Agreement and the other Transaction Agreements and acknowledge and agree that any such action by the Administrative Agent shall bind the Blackstone Entities and (ii) negotiate, enforce or settle any claim, action or proceeding affecting the Blackstone Entities in their capacity as such, at the direction of the Required Investors, which negotiation, enforcement or settlement will be binding upon each Blackstone Entity.

7.5.1.3 Fees. No fees shall be payable to the Administrative Agent by Alnylam or the Blackstone Entities in respect of the Administrative Agent’s service as collateral agent or administrative agent hereunder, except as may otherwise be agreed in writing by the Administrative Agent and such Person(s).

7.5.1.4 Costs and Expenses. The Blackstone Entities shall pay all reasonable and documented out-of-pocket expenses incurred by the Administrative Agent (limited, in the case of legal counsel, to the reasonable and documented fees, charges and disbursements of one legal counsel to the Administrative Agent), in connection with the preparation, negotiation, execution, delivery and administration of this Agreement and the other Transaction Agreements or any amendments, modifications or waivers of the provisions hereof or thereof (whether or not the transactions contemplated hereby or thereby shall be

consummated), in each relevant jurisdiction (which may include a single special counsel acting in multiple jurisdictions, in each case, in relevant jurisdictions material to the interests of the Blackstone Entities), in connection with the enforcement or protection of its rights (A) in connection with this Agreement and the other Transaction Agreements, including its rights under this Section 7.5.1.4, or (B) in connection with the transactions contemplated hereby, including all such out-of-pocket expenses incurred during any workout, restructuring or negotiations in respect of such transactions.

7.5.1.5 Indemnification by the Blackstone Entities. The Blackstone Entities shall indemnify the Administrative Agent (and any sub-agent thereof) and each Affiliate of any of the foregoing Persons (each such Person being called an “Agent Indemnatee”) against, and hold each Agent Indemnatee harmless from, any and all losses, claims, damages, liabilities and related expenses (including the fees, charges and disbursements of any counsel for any Indemnatee) incurred by any Agent Indemnatee or asserted against any Agent Indemnatee by any Person (including Alnylam or any other Blackstone Entity) arising out of, in connection with, or as a result of (i) the execution or delivery of this Agreement, any other Transaction Agreement or any agreement or instrument contemplated hereby or thereby, the performance by the parties hereto of their respective obligations hereunder or thereunder or the consummation of the transactions contemplated hereby or thereby, or, in the case of the Administrative Agent (and any sub-agent thereof) and its Affiliates only, the administration of this Agreement and the other Transaction Agreements, (ii) any payments or the use or proposed use of the proceeds therefrom, or (iii) any actual or prospective claim, litigation, investigation or proceeding relating to any of the foregoing, whether based on contract, tort or any other theory, whether brought by a third party or by Alnylam or any other Blackstone Entity, and regardless of whether any Agent Indemnatee is a party thereto; *provided* that such indemnity shall not, as to any Agent Indemnatee, be available to the extent that such losses, claims, damages, liabilities or related expenses (x) are determined by a court of competent jurisdiction by final and non-appealable judgment to have resulted from the gross negligence or willful misconduct of such Agent Indemnatee, (y) other than an Agent Indemnatee that is not the Administrative Agent and its Affiliates, result from a claim brought by any other Blackstone Entity against an Agent Indemnatee for a material breach of such Agent Indemnatee’s obligations hereunder or under any other Transaction Agreement, if such Blackstone Entity has obtained a final and non-appealable judgment in its favor on such claim as determined by a court of competent jurisdiction or (z) result from a claim not involving an act or omission of a Blackstone Entity and that is brought by an Agent Indemnatee against another Agent Indemnatee (other than against the Administrative Agent, any sub-agents and their Affiliates, in their capacities as such). This Section 7.5.1.5 shall not apply with respect to taxes other than any taxes that represent losses, claims, damages, etc. arising from any non-tax claim.

7.5.1.6 Waiver of Consequential Damages, Etc. To the fullest extent permitted by Applicable Law, no Blackstone Entity shall assert, and each Blackstone Entity hereby waives, and acknowledges that no other Person shall have, any claim against any Agent Indemnitee, on any theory of liability, for special, indirect, consequential or punitive damages (as opposed to direct or actual damages) arising out of, in connection with, or as a result of, this Agreement, any other Transaction Agreement or any agreement or instrument contemplated hereby, the transactions contemplated hereby or thereby, any payments contemplated hereby or the use or proposed use of the proceeds thereof. No Agent Indemnitee referred to in Section 7.5.1.5 above shall be liable for any damages arising from the use by unintended recipients of any information or other materials distributed to such unintended recipients by such Agent Indemnitee through telecommunications, electronic or other information transmission systems in connection with this Agreement or the other Transaction Agreements or the transactions contemplated hereby or thereby.

7.5.1.7 Payments. All amounts due under this Section 7.5.1 shall be payable not later than [***] after demand therefor together with a reasonably detailed invoice with respect thereto.

7.5.2 Right as a Blackstone Entity. If a Blackstone Entity is serving as the Administrative Agent hereunder, such Person shall have the same rights and powers in its capacity as a Blackstone Entity as any other Blackstone Entity and may exercise the same as though it were not the Administrative Agent and the term “Blackstone Entities” shall, unless otherwise expressly indicated or unless the context otherwise requires, include the Person serving as the Administrative Agent hereunder in its individual capacity. Such Person and its Affiliates may generally engage in any kind of financing or other business with Alnylam or other Affiliate thereof as if such Person were not the Administrative Agent hereunder and without any duty to account therefor to the Blackstone Entities or to provide notice to or consent of the Blackstone Entities with respect thereto. Notwithstanding anything to the contrary, any waiver or release by Alnylam of the Administrative Agent or Collateral Agent contained in this Section 7.5 shall be solely with respect to the Person serving in its capacity as Administrative Agent or Collateral Agent and shall not be deemed a release or waiver of any Blackstone Entity or any other Person in any other capacity or for any other purposes set forth in this Agreement.

7.5.3 Exculpatory Provisions.

7.5.3.1 Neither the Administrative Agent nor any of its officers, partners, directors, employees or agents shall have any duties or obligations except those expressly set forth herein and in the other Transaction Agreements, and its duties hereunder shall be administrative in nature. Without limiting the generality of the foregoing, the Administrative Agent and each of its officers, partners, directors, employees or agents:

(i) shall not be subject to any fiduciary or other implied duties, regardless of whether an Event of Default has occurred and is continuing and without limiting the generality of the foregoing, the use of the term “agent” herein and in other Transaction Agreements with reference to the Administrative Agent is not intended to connote any fiduciary or other implied (or express) obligations arising under any agency doctrine of any Applicable Law and instead, such term is used merely as a matter of market custom, and is intended to create or reflect only an administrative relationship between independent contracting parties;

(ii) shall not have any duty to take any discretionary action or exercise any discretionary powers, except discretionary rights and powers expressly contemplated hereby or by the other Transaction Agreements that the Administrative Agent is required to exercise as directed in writing by the Required Investors (or such other number or percentage of the Blackstone Entities as shall be expressly provided for herein or in the other Transaction Agreements); provided that the Administrative Agent shall not be required to take any action that, in its opinion or the opinion of its counsel, may expose the Administrative Agent to liability or that is contrary to any Transaction Agreement or Applicable Law, including for the avoidance of doubt refraining from any action that, in its respective opinion or the opinion of its respective counsel, may be a violation of the automatic stay under any bankruptcy, reorganization, insolvency, or similar laws or that may effect a forfeiture, modification or termination of property of a defaulting Blackstone Entity in violation of any bankruptcy, reorganization, insolvency, or similar laws;

(iii) shall not have any duty or responsibility to disclose, and shall not be liable for the failure to disclose, to any Blackstone Entity any credit or other information concerning the business, prospects, operations, property, financial and other condition or creditworthiness of Alnylam or any of its Affiliates that is communicated to, or in the possession of, the Administrative Agent or any of the Blackstone Indemnified Parties in any capacity, except for notices, reports and other documents expressly required to be furnished to the Blackstone Entities by the Administrative Agent herein;

(iv) shall not be liable for any action taken or not taken by it (A) with the consent or at the request of the Required Investors (or such other number or percentage of the Blackstone Entities as shall be necessary, or as the Administrative Agent shall believe in good faith shall be necessary, under the circumstances as provided in this Article 7) or (B) in the absence of its own gross negligence or willful misconduct as determined by the final and non-appealable judgment of a court of competent jurisdiction. The Administrative Agent shall not be deemed to have knowledge of any Event of Default unless and until written notice describing such Event of Default is given to the Administrative Agent by Alnylam or a Blackstone Entity;

(v) shall not be responsible for or have any duty to ascertain or inquire into (A) any statement, warranty or representation made in or in connection with this Agreement or any other Transaction Agreement, (B) the contents of any certificate,

report or other document delivered hereunder or thereunder or in connection herewith or therewith, (C) the performance or observance of any of the covenants, agreements or other terms or conditions set forth herein or therein or the occurrence of any Event of Default, (D) the validity, enforceability, effectiveness or genuineness of this Agreement, any other Transaction Agreement or any other agreement, instrument or document, or the creation, perfection or priority of any Lien purported to be created by the Transaction Agreements, (E) the value or the sufficiency of any Blackstone Collateral, or (F) the satisfaction of any condition set forth herein, other than to confirm receipt of items expressly required to be delivered to the Administrative Agent;

(vi) shall not be responsible for (A) perfecting, maintaining, monitoring, preserving or protecting the security interest or Lien granted under this Agreement, any other Transaction Agreement or any agreement or instrument contemplated hereby or thereby, (B) the filing, re-filing, recording, re-recording or continuing or any document, financing statement, mortgage, assignment, notice, instrument of further assurance or other instrument in any public office at any time or times or (C) providing, maintaining, monitoring or preserving insurance on or the payment of taxes with respect to any of the Blackstone Collateral. The actions described in items (A) through (C) shall be the sole responsibility of Alnylam;

(vii) shall not be responsible or liable for any failure or delay in the performance of its obligations under this Agreement or the other Transaction Agreements arising out of or caused, directly or indirectly, by circumstances beyond its reasonable control, including, without limitation, acts of God; earthquakes; fire; flood; terrorism; wars and other military disturbances; sabotage; epidemics; pandemics, riots; business interruptions; loss or malfunctions of utilities, computer (hardware or software) or communication services; accidents; labor disputes; acts of civil or military authority and governmental action;

(viii) shall not be (A) required to qualify in any jurisdiction in which it is not presently qualified to perform its obligations as such Administrative Agent or (B) required to take any enforcement action against Alnylam or any other obligor outside of the United States;

(ix) shall not be responsible for the negligence, misconduct or other action or inaction of any sub-agent that it selects as provided in Section 7.5.5 absent gross negligence or willful misconduct by the Administrative Agent (as determined in a final and non-appealable judgment by a court of competent jurisdictions) in the selection of such sub-agents;

(x) shall neither be responsible for, nor chargeable with, knowledge of the terms and conditions of any other agreement, instrument, or document other than this Agreement and any other Transaction Agreement to which Administrative

Agent is a party, whether or not an original or a copy of such agreement has been provided to the Administrative Agent; and

(xi) shall not be responsible for nor have any duty to monitor the performance or any action of Alnylam, the Blackstone Entities, or any of their directors, members, officers, agents, Affiliates or employee, nor shall they have any liability in connection with the malfeasance or nonfeasance by such party; the Administrative Agent may assume performance by all such Persons of their respective obligations.

7.5.3.2 Each Blackstone Entity acknowledges and agrees that neither such Blackstone Entity, nor any of its Affiliates, participants or assignees, may rely on the Administrative Agent to carry out such Blackstone Entity's, Affiliate's, participant's or assignee's customer identification program, or other obligations required or imposed under or pursuant to any anti-terrorism Law, including any programs involving any of the following items relating to or in connection with Alnylam or its Subsidiaries, any of their respective Affiliates or agents, the Transaction Agreements or the transactions hereunder: (i) any identity verification procedures, (ii) any record keeping, (iii) any comparisons with government lists, (iv) any customer notices or (v) any other procedures required under any anti-terrorism Law.

7.5.3.3 The delivery by Alnylam of any reports, information and documents to the Administrative Agent is for informational purposes only and the Administrative Agent's receipt of such shall not constitute constructive notice of any information contained therein or determinable from information contained therein. Each party to this Agreement acknowledges and agrees that the Administrative Agent may, but shall not be obligated to, from time to time use one or more outside service providers for the tracking of all UCC financing statements (and/or other collateral related filings and registrations from time to time) required to be filed or recorded pursuant to the Transaction Agreements and the notification to the Administrative Agent, of, among other things, the upcoming lapse or expiration thereof, and that each of such service providers will be deemed to be acting at the request and on behalf of Alnylam. The Administrative Agent shall not be liable for any action taken or not taken by any such service provider. Neither the Administrative Agent nor any of its officers, partners, directors, employees or agents shall be liable to the Blackstone Entities for any action taken or omitted by the Administrative Agent under or in connection with any of the Transaction Agreements.

7.5.4 Reliance by Administrative Agent. The Administrative Agent shall be entitled to rely upon, and shall be fully protected in relying and shall not incur any liability for relying upon, any notice, request, certificate, communication, consent, statement, instrument, document or other writing (including any electronic message, Internet or intranet website posting or other distribution) believed by it to be genuine and to have been signed,

sent or otherwise authenticated by the proper Person. The Administrative Agent also may rely upon any statement made to it orally or by telephone and believed by it to have been made by the proper Person, and shall be fully protected in relying and shall not incur any liability for relying thereon. In determining compliance with any condition hereunder to the Blackstone Entities' funding obligations under this Agreement that by its terms must be fulfilled to the satisfaction of a Blackstone Entity, the Administrative Agent may presume that such condition is satisfactory to such Blackstone Entity unless the Administrative Agent shall have received notice to the contrary from such Blackstone Entity prior to funding such obligation. The Administrative Agent may consult with legal counsel (who may be counsel for the Blackstone Entities), independent accountants and other experts selected by it, and shall not be liable for any action taken or not taken by it in accordance with the advice of any such counsel, accountants or experts. For purposes of determining compliance with the conditions specified in Section 4.2, each Blackstone Entity that has signed this Agreement shall be deemed to have consented to, approved or accepted or to be satisfied with, each document or other matter required thereunder to be consented to or approved by or acceptable or satisfactory to a Blackstone Entity unless the Administrative Agent shall have received written notice from such Blackstone Entity prior to the proposed funding date specifying its objections.

7.5.5 Delegation of Duties. The Administrative Agent may perform any and all of its duties and exercise its rights and powers hereunder or under any other Transaction Agreement by or through any one or more sub-agents appointed by the Administrative Agent. The Administrative Agent and any such sub-agent may perform any and all of its duties and exercise its rights and powers by or through their Affiliates. The exculpatory provisions of this Section 7.5 shall apply to any such sub-agent, their respective Affiliates and to the Blackstone Indemnified Parties, and shall apply to their activities as Administrative Agent. The Administrative Agent shall not be responsible for the negligence or misconduct of any sub-agents except to the extent that a court of competent jurisdiction determines in a final and non-appealable judgment that the Administrative Agent acted with gross negligence or willful misconduct in the selection of such sub-agents.

7.5.6 Resignation.

7.5.6.1 Notice. The Administrative Agent may at any time give notice of its resignation to the Blackstone Entities and Alnylam. Upon receipt of any such notice of resignation, the Required Investors shall have the right to appoint a successor with the prior written consent of Alnylam (such consent not to be unreasonably withheld, conditioned or delayed). If no such successor shall have been so appointed by the Required Investors and shall have accepted such appointment within thirty (30) days after the retiring Administrative Agent gives notice of its resignation (or such earlier day as shall be agreed by the Required Investors) (the "Resignation Effective Date"), then the retiring Administrative Agent may (but shall not be obligated to) on behalf of the Blackstone Entities appoint a successor Administrative Agent with the prior written consent of Alnylam (such

consent not to be unreasonably withheld, conditioned or delayed). Whether or not a successor has been appointed, such resignation shall become effective in accordance with such notice on the Resignation Effective Date. In addition, upon not less than ten (10) days prior written notice (the “Removal Effective Date”), the Administrative Agent may be removed (with or without cause) by the Required Investors at any time in their sole discretion, but with the prior written consent of Alnylam (such consent not to be unreasonably withheld, conditioned or delayed). Notwithstanding the foregoing and for the avoidance of doubt, Alnylam’s consent shall not be required for any successor or replacement Administrative Agent that is, or is an Affiliate of, (a) any Blackstone Entity, or (b) any Person to whom a Blackstone Entity has assigned any of its obligations and rights hereunder in accordance with Section 14.6. Solely for purposes of the foregoing sentence, “Affiliate” shall include The Blackstone Group Inc. and any of its divisions, including Blackstone Life Science Advisors L.L.C.

7.5.6.2 Effect of Resignation or Removal. With effect from the Resignation Effective Date or the Removal Effective Date, as applicable (i) the retiring or removed Administrative Agent shall be discharged from its duties and obligations hereunder and under the other Transaction Agreements and (ii) except for any indemnity payments or other amounts then owed to the retiring Administrative Agent, all payments, communications and determinations provided to be made by, to or through the Administrative Agent shall instead be made by or to each Blackstone Entity directly, until such time, if any, as the Required Investors or retiring Administrative Agent appoint a successor Administrative Agent as provided for above. Upon the acceptance of a successor’s appointment as Administrative Agent hereunder, such successor shall succeed to and become vested with all of the rights, powers, privileges and duties of the retiring Administrative Agent and other than any rights to indemnity payments or other amounts owed to the retiring or removed Administrative Agent as of the Resignation Effective Date or the Removal Effective Date, as applicable), and the retiring or removed Administrative Agent shall be discharged from all of its duties and obligations hereunder or under the other Transaction Agreements (if not already discharged therefrom as provided above in this Section 7.5.6). After the retiring or removed Administrative Agent’s resignation or removal hereunder and under the other Transaction Agreements, the provisions of this Section 7.5 shall continue in effect for the benefit of such retiring or removed Administrative Agent, its sub agents and their respective Affiliates in respect of any actions taken or omitted to be taken by any of them (A) while the retiring Administrative Agent was acting as Administrative Agent and (B) after such resignation for as long as any of them continues to act in any capacity hereunder or under the other Transaction Agreements, including, without limitation, (1) acting as collateral agent or otherwise holding any collateral security on behalf of any of the Secured Parties and (2) in respect of any actions taken in connection with transferring the agency to any successor Administrative Agent.

7.5.7 Non-Reliance on Administrative Agent and the Other Blackstone Entities Each Blackstone Entity expressly acknowledges that the Administrative Agent has not made any representation or warranty to it, and that no act by the Administrative Agent hereafter taken, including any consent to, and acceptance of any assignment or review of the affairs of Alnylam or any Affiliate thereof, shall be deemed to constitute any representation or warranty by the Administrative Agent to any Blackstone Entity as to any matter, including whether the Administrative Agent has disclosed material information in its (or its Affiliates') possession. Each Blackstone Entity represents to the Administrative Agent that it has, independently and without reliance upon the Administrative Agent, any other Blackstone Entity or any of their respective Affiliates and based on such documents and information as it has deemed appropriate, made its own analysis of, appraisal of, and investigation into, the business, prospects, operations, property, financial and other condition and creditworthiness of Alnylam and its Subsidiaries, and all Applicable Laws relating to the transactions contemplated hereby, and made its own decision to enter into this Agreement. Each Blackstone Entity also acknowledges that it will, independently and without reliance upon the Administrative Agent, any other Blackstone Entity or any of their respective Affiliates and based on such documents and information as it shall from time to time deem appropriate, continue to make its own analysis, appraisals and decisions in taking or not taking action under or based upon this Agreement, any other Transaction Agreement or any related agreement or any document furnished hereunder or thereunder, and to make such investigations as it deems necessary to inform itself as to the business, prospects, operations, property, financial and other condition and creditworthiness of Alnylam. Each Lender represents and warrants that it is sophisticated with respect to decisions to make, acquire and/or hold financial investments as set forth herein, and either it, or the Person exercising discretion in making its decision to make, acquire and/or hold such financial investments, is experienced in making, acquiring or holding such financial investments.

7.5.8 No Other Duties, Etc. The Administrative Agent may at any time request instructions from the Blackstone Entities with respect to any actions or approvals which by the terms of this Agreement or of any of the other Transaction Agreements the Administrative Agent is permitted or desires to take or to grant, and if such instructions are promptly requested, the Administrative Agent shall be absolutely entitled to refrain from taking any action or to withhold any approval and shall not be under any liability whatsoever to any Person for refraining from any action or withholding any approval under any of the Transaction Agreements until it shall have received such instructions from the Required Investors or all or such other portion of the Blackstone Entities as shall be prescribed by this Agreement. Without limiting the foregoing, no Person shall have any right of action whatsoever against the Administrative Agent as a result of the Administrative Agent acting or refraining from acting under this Agreement or any of the other Transaction Agreements in accordance with the instructions of the Required Investors (or all or such other portion of the Blackstone Entities as shall be prescribed by this Agreement) and, notwithstanding the instructions of the Required Investors (or such other applicable portion of the Blackstone Entities), the Administrative Agent shall have no obligation to take any action if it believes,

in good faith, that such action would violate Applicable Law or exposes the Administrative Agent to any liability for which it is not entitled to satisfactory reimbursement and indemnification in accordance with the provisions of Section 7.5.1.5. Anything herein to the contrary notwithstanding, none of the titles listed on the cover page hereof shall have any powers, duties or responsibilities under this Agreement or any of the other Transaction Agreements, except in its capacity, as applicable, as the Administrative Agent or a Blackstone Entity hereunder.

7.5.9 Administrative Agent May File Proofs of Claim; Credit Bidding.

7.5.9.1 In case of the pendency of any proceeding under any bankruptcy, reorganization, insolvency, or similar laws or any other judicial proceeding relative to Alnylam, the Administrative Agent (irrespective of whether the Alnylam Obligations shall then be due and payable as herein expressed or by declaration or otherwise and irrespective of whether the Administrative Agent shall have made any demand on Alnylam) shall be entitled and empowered, by intervention in such proceeding or otherwise:

(i) to file and prove a claim for the whole amount of the Alnylam Obligations owing and unpaid and all other obligations that are owing and unpaid and to file such other documents as may be necessary or advisable in order to have the claims of the Blackstone Entities and the Administrative Agent (including any claim for the reasonable compensation, expenses, disbursements and advances of the Blackstone Entities and the Administrative Agent and their respective agents and counsel to the extent provided for herein and all other amounts due the Blackstone Entities and the Administrative Agent under Section 7.5.1) allowed in such judicial proceeding; and

(ii) to collect and receive any monies or other property payable or deliverable on any such claims and to distribute the same;

7.5.9.2 and any custodian, receiver, assignee, trustee, liquidator, sequestrator or other similar official in any such judicial proceeding is hereby authorized by each Blackstone Entity to make such payments to the Administrative Agent and, in the event that the Administrative Agent shall consent to the making of such payments directly to the Blackstone Entities, to pay to the Administrative Agent any amount due for the reasonable compensation, expenses, disbursements and advances of the Administrative Agent and its agents and counsel, and any other amounts due the Administrative Agent under Section 7.5.1.

7.5.9.3 Nothing contained herein shall be deemed to authorize the Administrative Agent to authorize or consent to or accept or adopt on behalf of any Blackstone Entity any plan of reorganization, arrangement, adjustment or composition affecting the Alnylam Obligations or the rights of any to authorize the

Administrative Agent to vote in respect of the claim of any Blackstone Entity or in any such proceeding.

7.5.9.4 The Blackstone Entities hereby irrevocably authorize the Administrative Agent, at the direction of the Required Investors, to credit bid all or any portion of the Alnylam Obligations (including accepting some or all of the Blackstone Collateral in satisfaction of some or all of the Alnylam Obligations pursuant to a deed in lieu of foreclosure or otherwise) and in such manner purchase (either directly or through one or more acquisition vehicles) all or any portion of the Blackstone Collateral (i) at any sale thereof conducted under the provisions of the Bankruptcy Code of the United States, including under Sections 363, 1123 or 1129 of the Bankruptcy Code of the United States, or any similar Laws in any other jurisdictions to which Alnylam is subject, (ii) at any other sale or foreclosure or acceptance of collateral in lieu of debt conducted by (or with the consent or at the direction of) the Administrative Agent (whether by judicial action or otherwise) in accordance with any Applicable Law. In connection with any such credit bid and purchase, the Alnylam Obligations owed to the Blackstone Entities shall be entitled to be, and shall be, credit bid on a ratable basis (with Alnylam Obligations with respect to contingent or unliquidated claims receiving contingent interests in the acquired assets on a ratable basis that would vest upon the liquidation of such claims in an amount proportional to the liquidated portion of the contingent claim amount used in allocating the contingent interests) in the asset or assets so purchased (or in the equity interests or debt instruments of the acquisition vehicle or vehicles that are used to consummate such purchase). In connection with any such bid (A) the Administrative Agent shall be authorized to form one or more acquisition vehicles to make a bid, (B) to adopt documents providing for the governance of the acquisition vehicle or vehicles (provided that any actions by the Administrative Agent with respect to such acquisition vehicle or vehicles, including any disposition of the assets or equity interests thereof shall be governed, directly or indirectly, by the vote of the Required Investors, irrespective of the termination of this Agreement), and (C) to the extent that Alnylam Obligations that are assigned to an acquisition vehicle are not used to acquire Blackstone Collateral for any reason (as a result of another bid being higher or better, because the amount of Alnylam Obligations assigned to the acquisition vehicle exceeds the amount of debt credit bid by the acquisition vehicle or otherwise), such Alnylam Obligations shall automatically be reassigned to the Blackstone Entities pro rata and the equity interests and/or debt instruments issued by any acquisition vehicle on account of the Alnylam Obligations that had been assigned to the acquisition vehicle shall automatically be cancelled, without the need for any Blackstone Entity or any acquisition vehicle to take any further action.

7.5.10 Collateral Matters.

7.5.10.1 Each of the Blackstone Entities irrevocably authorize the Administrative Agent, at its option and in its discretion,

(i) to release any Lien on any property granted to or held by the Administrative Agent under any Transaction Agreement (A) upon all Alnylam Obligations (other than contingent indemnity obligations) having been paid or otherwise satisfied in full in accordance with this Agreement, or (B) if approved, authorized or ratified in writing by the Required Investors; and

(ii) to subordinate any Lien on any property granted to or held by the Administrative Agent under any Transaction Agreement to the holder of any Lien on such property if approved, authorized or ratified in writing by the Required Investors.

7.5.10.2 Upon request by the Administrative Agent at any time, the Required Investors will confirm in writing the Administrative Agent's authority to release or subordinate its interest in particular types or items of property pursuant to this Section 7.5.10. In each case as specified in this Section 7.5.10, the Administrative Agent will, at Alnylam's expense, execute and deliver to Alnylam such documents as Alnylam may reasonably request to evidence the release of such item of Blackstone Collateral from the assignment and security interest granted under the Transaction Agreements or to subordinate its interest in such item, in each case in accordance with the terms of the Transaction Agreements and this Section 7.5.10.

7.5.10.3 The Administrative Agent shall not be responsible for or have a duty to ascertain or inquire into any representation or warranty regarding the existence, value or collectability of the Blackstone Collateral, the existence, priority or perfection of the Administrative Agent's Lien thereon, or any certificate prepared by Alnylam in connection therewith, nor shall the Administrative Agent be responsible or liable to the Blackstone Entities for any failure to monitor or maintain any portion of the Blackstone Collateral.

7.5.11 Survival. This Section 7.5 and any other indemnity provisions in favor of any Agent Indemnitee elsewhere in this Agreement shall survive the termination of this Agreement, the repayment, satisfaction or discharge of all Obligations and the resignation, removal or replacement of the Administrative Agent.

ARTICLE 8

RECORDS

8.1 Accounting. Alnylam will maintain complete and accurate accounting records related to this Agreement in accordance with GAAP for [***] after the conclusion of the Term.

8.2 Clinical Trials-Related Records. Alnylam will, and will cause its Affiliates and its and their Permitted Third Parties conducting Development of the Products to, maintain, in good scientific manner, complete and accurate books and records pertaining to

Development of the Products hereunder, in sufficient detail to verify compliance with its obligations under this Agreement. Such books and records will (a) be appropriate for patent and regulatory purposes, (b) be in compliance with Applicable Law in all material respects, (c) properly reflect all work done and results achieved in the performance of its Development activities hereunder, and (d) be retained by such Party for such period as may be required by Applicable Law.

8.3 Records; Audits. Alnylam will keep and maintain accurate and complete records of Net Sales and Development Cost expenditures during the [***] preceding Calendar Years. Upon [***] prior written notice from Blackstone, Alnylam will permit an independent certified public accounting firm of internationally recognized standing, selected by Blackstone and reasonably acceptable to Alnylam, to examine the relevant books and records of Alnylam and its Affiliates, as may be reasonably necessary to verify the royalty reports provided by Alnylam in accordance with Section 6.3.2. An examination by Blackstone under this Section 8.3 will occur not more than once in any Calendar Year. The accounting firm will be provided access to such books and records at Alnylam's facility or facilities where such books and records are normally kept and such examination will be conducted during Alnylam's normal business hours. Upon completion of the audit, the accounting firm will provide to both Parties a written report disclosing whether the reports submitted by Alnylam are correct or incorrect and the specific details concerning any discrepancies. No other information will be provided to Blackstone. If the report or information submitted by Alnylam results in an underpayment or overpayment, the Party owing the underpaid or overpaid amount will promptly pay such amount to the other Party. The costs and fees of any audit conducted by Blackstone under this Section 8.3 will be borne by Blackstone, unless such audit reveals an underpayment of amounts owed to Blackstone of more than [***] of the amount that was owed by Alnylam with respect to the relevant period, in which case, Alnylam will reimburse Blackstone for the reasonable expense incurred by Blackstone in connection with the audit.

ARTICLE 9

CONFIDENTIAL INFORMATION

9.1 Confidentiality. Except to the extent expressly authorized by this Agreement or otherwise agreed in writing by the Parties, each Party (each, a "Receiving Party") agrees that, during the Term and for the [***] period following the conclusion of the Term (except that the obligations will survive thereafter with respect to any Confidential Information that constitutes a trade secret under Applicable Law) or such longer period for which such Confidential Information may be maintained pursuant to Article 8, will keep confidential and will not publish or otherwise disclose and will not use for any purpose other than as provided for in this Agreement (which includes the exercise of any rights or the performance of any obligations hereunder or thereunder) any Confidential Information furnished to it by or on behalf of the other Party (each, a "Disclosing Party") or its Affiliates in connection with this

Agreement. The foregoing obligations will not apply to any portion of such information or materials that the Receiving Party can demonstrate:

9.1.1 was publicly disclosed by the Disclosing Party before or after such Confidential Information becomes known to the Receiving Party;

9.1.2 was already known to the Receiving Party or any of its Affiliates, other than under an obligation of confidentiality or non-use, prior to when it was received from the Disclosing Party;

9.1.3 is subsequently disclosed to the Receiving Party or any of its Affiliates by a Third Party lawfully in possession thereof without obligation to keep such Confidential Information confidential;

9.1.4 has been published by a Third Party or otherwise enters the public domain through no fault of the Receiving Party or any of its Affiliates in breach of this Agreement; or

9.1.5 has been independently developed by the Receiving Party or any of its Affiliates, without the aid, application or use of any Confidential Information of the other Party.

9.2 Authorized Disclosure. Each Party may disclose Confidential Information belonging to the other Party to the extent such disclosure is reasonably necessary for complying with Applicable Laws, including regulations promulgated by securities exchanges, provided that the Party required to disclose such information promptly notifies the Disclosing Party prior to making any such disclosure and cooperates with the Disclosing Party's efforts to seek confidential treatment or to otherwise limit disclosure. Each Receiving Party may disclose the other Party's Confidential Information to its Representatives, in each case (a) only to the extent such Persons need to know the Confidential Information solely in connection with the performance of this Agreement, and (b) provided that each Person receiving Confidential Information must be bound by obligations of confidentiality and non-use at least as stringent as an equivalent in scope to those set forth in this Article 9 prior to any such disclosure and the Party making such disclosure to such Person will be liable to the other Party for any breach of such obligations by such discloser (provided that a Party's Representative(s) will only be bound by the obligations set forth in this Article 9 to the extent that such Representative(s) actually receives such Confidential Information). Each Party may also disclose the material terms of this Agreement and updates regarding the Development and Commercialization progress of Products under this Agreement, or a summary of such Party's findings during its due diligence investigation of the Products (if applicable) to any bona fide potential or actual investor, investment banker, acquirer, provider of debt or royalty financing, or other potential or actual financial partner without the consent of the other Party, and provided that in connection with such disclosure, each discloser must be bound by obligations of

confidentiality and non-use at least as stringent as an equivalent in scope to those set forth in this ARTICLE 10 prior to any such disclosure and the Party making such disclosure to such discloser will be liable to the other Party for any breach of such obligations by such discloser. Notwithstanding anything in the foregoing to the contrary, the Development Plans, and all reports, results, data or other information provided to Blackstone by or on behalf of Alnylam constitute Alnylam's Confidential Information, and Alnylam may disclose the Development Plans to Third Parties as determined by Alnylam in its sole discretion. For clarity, nothing in this Section 9.2 shall limit a Party from disclosing or otherwise exploiting its own Confidential Information. In any event, each Party agrees to take all reasonable action to avoid unauthorized use or disclosure of Confidential Information of the other Party hereunder.

9.3 Return of Confidential Information. Except as otherwise provided herein, upon expiration or earlier termination of this Agreement, all Confidential Information (including any copies thereof) in written or other tangible form will, at the Disclosing Party's direction, be returned to the Disclosing Party or destroyed by the Receiving Party, and any Person(s) to whom the Receiving Party disclosed (with such destruction being confirmed in writing by an authorized officer of the Receiving Party), except (i) to the extent such Confidential Information is necessary to exercise any license or rights hereunder that survive such expiration or earlier termination; and (ii) one (1) copy of each document may be retained by the Receiving Party solely to the extent necessary to permit it to comply with any ongoing rights and responsibilities with respect to such Confidential Information.

9.4 Confidential Status of the Agreement. Subject to Section 9.2 and Section 9.5, the terms of this Agreement are deemed to be Confidential Information and will be subject to the confidentiality requirements of this Article 9, with each Party being deemed a Receiving Party for such purposes. The Parties each acknowledge that it may be necessary for Alnylam to file this Agreement with the U.S. Securities and Exchange Commission and to make other required public disclosures regarding the terms of this Agreement, and accordingly Alnylam will prepare a confidential treatment request in connection with such filing and provide Blackstone a reasonable opportunity to review and comment on such filing as well as on such other required public disclosures, which comments Alnylam will consider and incorporate in good faith, and thereafter use Commercially Reasonable Efforts to obtain confidential treatment as to the terms of this Agreement.

9.5 Publicity. The Parties recognize that following the Effective Date the Parties (either individually or jointly) will issue mutually agreed press release(s) announcing the execution of this Agreement, and thereafter each Party may from time to time desire to issue additional press releases and make other public statements or disclosures regarding the subject matter of this Agreement, and hereby agree that such additional press releases, public statements and disclosures regarding the terms of this Agreement will be permitted only with the other Party's prior written consent (which will not be unreasonably withheld, conditioned or delayed). Any publication, news release or other public announcement relating to the terms of this Agreement will first be reviewed and approved in writing by both Parties;

provided, however, that any disclosure of the minimum information which is required by Applicable Law (including the rules of a securities exchange), as reasonably advised by the Disclosing Party's counsel, may be made without the prior consent of the other Party, although the other Party will be given prompt notice of any such legally required disclosure and will be provided an opportunity to comment on the proposed disclosure and the Disclosing Party will consider in good faith any comments provided by the other Party on such proposed disclosure.

ARTICLE 10

INTELLECTUAL PROPERTY

10.1 Ownership and Rights.

10.1.1 Ownership.

10.1.1.1 Alnylam will own and retain all right, title and interest in, to and under all data, results, information, analyses, discoveries, inventions and know-how that are Controlled by Alnylam as of the Effective Date and no such right, title or interest therein, thereto or thereunder is granted to Blackstone hereunder, except as expressly set forth herein.

10.1.1.2 Blackstone will own and retain all right, title and interest in, to and under all data, results, information, analyses, discoveries, inventions and know-how that are Controlled by Blackstone as of the Effective Date and no such right, title or interest therein, thereto or thereunder is granted to Alnylam hereunder, except as set forth herein.

10.1.1.3 As between the Parties, Alnylam and/or its Affiliates will be the exclusive and sole owner of and retain all right, title and interest in, to and under (a) the Products, (b) Research Results, (c) all discoveries, data, results, summaries, know-how and inventions (whether or not patentable) discovered, developed or invented by, or on behalf of, either Party, and any of their Affiliates, and any Permitted Third Party, in performance of the Clinical Trial (including the Research Results), and (d) all improvements that are discovered, developed or invented by, or on behalf of Alnylam under or in performance of this Agreement that relate to Intellectual Property that is Controlled by Alnylam as of the Effective Date (collectively, the "Alnylam Improvements") and (d) all Intellectual Property in the foregoing subsections (a) through (d) (all of the foregoing (a)-(d), collectively, the "Trial Inventions"). Subject to Section Article 7, Blackstone will, and hereby does, assign to Alnylam all rights, title and interest of Blackstone in, to and under the Trial Inventions, if any.

10.1.1.4 The delivery or disclosure by or on behalf of Alnylam to Blackstone of any information or materials hereunder will not be

construed to grant Blackstone any rights or license to use any Intellectual Property Controlled by Alnylam other than as necessary to comply with its obligations hereunder or as expressly set forth herein. All Alnylam Intellectual Property shall be deemed to be the Confidential Information of Alnylam.

10.2 Patent Prosecution. As between Blackstone and Alnylam, Alnylam will have sole and exclusive right to prepare, file, prosecute and maintain all Patents within the Alnylam Intellectual Property, including all Patents that cover the Trial Inventions, at its own expense and in its sole discretion (but, for clarity, using the level of efforts and resources that Alnylam uses with respect to obtaining and maintaining intellectual property rights related to other products with similar commercial potential), and will keep Blackstone reasonably informed with respect thereto. Notwithstanding the foregoing, Alnylam will not abandon or allow to lapse any Patents included in the ALN-AGT Product IP or the Vutrisiran Product IP without providing Blackstone with prior written notice thereof and considering any reasonable comments of Blackstone in good faith.

10.3 Intellectual Property Enforcement.

10.3.1 Alnylam Intellectual Property. Alnylam will have the sole and exclusive right but not the obligation to enforce the Alnylam Intellectual Property Controlled by Alnylam, including Intellectual Property that covers the Trial Inventions, against Third Party Infringements at its sole expense and discretion.

10.3.2 Infringement of Third Party Rights. If either Party learns of Third Party allegations that Alnylam or any of its Affiliates or Permitted Third Parties, have infringed, misappropriated or otherwise violated, or are infringing, misappropriating or otherwise violating, any Intellectual Property of a Third Party in connection with either the Product Clinical Trials or performing its obligations or duties hereunder, such Party will promptly notify the other Party. Alnylam will have sole control and responsibility of, and discretion with respect to, such allegations and any related actions or litigation at its sole expense, but will keep Blackstone reasonably informed with respect thereto. Alnylam will not settle or compromise any allegation, action or litigation in a way that admits fault or liability on the part of Blackstone or otherwise results in any cost or liability on the part of Blackstone.

ARTICLE 11

INDEMNIFICATION AND INSURANCE

11.1 Indemnification by Each Party.

11.1.1 By Blackstone. Blackstone will indemnify and hold Alnylam, its Affiliates and its and their respective officers, directors, employees and agents (the "Alnylam Indemnified Parties") harmless from any and all Losses arising or resulting from any Claims by a Third Party against any Alnylam Indemnified Parties to the extent arising from (a) the

gross negligence or willful misconduct of Blackstone in performing Blackstone's obligations under this Agreement; and (b) Blackstone's material breach of this Agreement; except to the extent that the foregoing (a) or (b) was caused by (i) the gross negligence or willful misconduct of any Alnylam Indemnified Party, or (ii) a material breach of this Agreement by Alnylam.

11.1.2 By Alnylam. Alnylam will indemnify and hold Blackstone, its Affiliates, its investors and its and their respective officers, directors, employees and agents (the "Blackstone Indemnified Parties"), harmless from any and all Losses arising or resulting from any Claims by a Third Party against any Blackstone Indemnified Parties to the extent arising from (a) a Product supplied by or on behalf of Alnylam, its Affiliates or sublicensees; (b) a Product Clinical Trial, including a physical injury or death of a Subject that is caused by a Subject's participation in a Product Clinical Trial, whether or not directly attributable to a Product; (c) Alnylam's gross negligence or willful misconduct in performing its obligations under this Agreement; (d) Alnylam's material breach of this Agreement (e) the actions (or inactions) of a Permitted Third Party, (f) any material breach of a Protocol by Alnylam, or its Affiliate, or of its or their respective Permitted Third Parties, (g) actual or alleged infringement of any Third Party's Intellectual Property by a Product (including its use or manufacture) or by either Party in performing its duties or obligations hereunder with respect to a Product; and (h) injuries sustained by Subjects in connection with the Product Clinical Trials, including Claims arising prior to the Effective Date based upon physical injury or death of a Subject in connection with the Product Clinical Trials, or from the Commercialization of a Product; except to the extent that any of the foregoing (a) through (h) were caused by (i) the gross negligence or willful misconduct of any Blackstone Indemnified Party, or (ii) material breach of this Agreement by Blackstone.

11.2 Indemnification Procedure.

11.2.1 Notice of Claim. A Party believing that it is entitled to indemnification under Section 11.1.1 or 11.1.2 (an "Indemnified Party") will give prompt written notice (each, an "Indemnification Claim Notice") to the other Party (the "Indemnifying Party") upon receipt of notice of the commencement of any Claim for which indemnification may be sought, or if earlier, upon the assertion of any such Claim by a Third Party (it being understood and agreed, however, that the failure by an Indemnified Party to give notice of a Claim of a Third Party as provided in this Section 11.2.1 will not relieve the Indemnifying Party of its indemnification obligation under this Agreement except and only to the extent that such Indemnifying Party is actually prejudiced as a result of such failure to give notice). Each Indemnification Claim Notice will contain a description of the Claim and the nature and amount of the Loss (to the extent that the nature and amount of such Loss are known at such time). The Indemnified Party will furnish promptly to the Indemnifying Party copies of all papers and official documents received in respect of any Losses.

11.2.2 Control of Defense. At its option, the Indemnifying Party may assume the defense of any Claim by giving written notice to the Indemnified Party within [***] after

the Indemnifying Party's receipt of an Indemnification Claim Notice. The assumption of the defense of a Claim by the Indemnifying Party will not be construed as an acknowledgment that the Indemnifying Party is liable to indemnify the Indemnified Party in respect of the Claim, nor will it constitute a waiver by the Indemnifying Party of any defenses it may assert against the Indemnified Party's claim for indemnification. Upon assuming the defense of a Claim, the Indemnifying Party may appoint as lead counsel in the defense of the Claim any legal counsel selected by the Indemnifying Party that is reasonably satisfactory to the Indemnified Party. In the event the Indemnifying Party assumes the defense of a Claim, the Indemnified Party will promptly deliver to the Indemnifying Party all original notices and documents (including court papers) received by the Indemnified Party in connection with the Claim. Should the Indemnifying Party assume the defense of a Claim, the Indemnifying Party will not be liable to the Indemnified Party for any legal expenses subsequently incurred by such Indemnified Party in connection with the analysis, defense or settlement of such Claim.

11.2.3 Right to Participate in Defense. Without limiting Section 11.2.2, the Indemnified Party will be entitled to (a) participate in, but not control, the defense of such Claim and to engage counsel of its choice for such purpose; provided, however, that such engagement will be at the Indemnified Party's own expense unless the engagement thereof has been specifically authorized by the Indemnifying Party in writing, and (b) control its defense of such Claim and to engage counsel of its choice for such purpose, at the expense of the Indemnifying Party, if the Indemnifying Party has failed to assume the defense and engage counsel in accordance with Section 11.2.2.

11.2.4 Settlement. With respect to any Losses related solely to payment of money damages in connection with a Claim that (a) includes a complete and unconditional release of the Indemnified Party, (b) will not result in the Indemnified Party admitting liability, becoming subject to injunctive or other equitable relief that will otherwise adversely affect the business of the Indemnified Party in any manner, and (c) as to which the Indemnifying Party will have acknowledged in writing the obligation to indemnify the Indemnified Party hereunder, the Indemnifying Party will have the sole right to consent to the entry of any judgment, enter into any settlement or otherwise dispose of such Loss, on such terms as the Indemnifying Party, in its sole discretion, will deem appropriate. With respect to all other Losses in connection with Claims, where the Indemnifying Party has assumed the defense of the Claim in accordance with Section 11.2.2, the Indemnifying Party will have authority to consent to the entry of any judgment, enter into any settlement or otherwise dispose of such Loss, only if it obtains the prior written consent of the Indemnified Party (which consent will not be unreasonably withheld, conditioned or delayed). The Indemnifying Party will not be liable for any settlement or other disposition of a Loss by the Indemnified Party that is reached without the written consent of the Indemnifying Party (which consent will not be unreasonably withheld, conditioned or delayed). Regardless of whether the Indemnifying Party chooses to defend or prosecute any Claim, the Indemnified Party will not admit any liability with respect to, or settle, compromise or discharge, any

Claim without the prior written consent of the Indemnifying Party, not to be unreasonably withheld or delayed.

11.2.5 Cooperation. Regardless of whether the Indemnifying Party chooses to defend or prosecute any Claim, the Indemnified Party will reasonably cooperate in the defense or prosecution thereof and will furnish such records, information and testimony, provide such witnesses and attend such conferences, discovery proceedings, hearings, trials and appeals as may be reasonably requested in connection therewith. Such cooperation will include access during normal business hours afforded to the Indemnifying Party to, and reasonable retention by the Indemnified Party of, records and information that are reasonably relevant to such Claim, and making employees and agents available on a mutually convenient basis to provide additional information and explanation of any material provided hereunder, and the Indemnifying Party will reimburse the Indemnified Party for all its reasonable out-of-pocket expenses in connection therewith.

11.3 Insurance.

11.3.1 Generally. Commencing as of the Effective Date and thereafter during the Development Term, and subject to Section 11.3.2 below, Alnylam will carry and maintain, at its own expense, insurance coverage of the kind and with liability limits that, at a minimum, satisfy the requirements of Section 11.3.2, to protect itself against any claims or liabilities that may arise from the conduct of the Product Clinical Trials and all other rights and obligations hereunder with insurers with a minimum “A-” A.M. Best rating. Any deductibles for such insurance policies will be assumed by Alnylam. Prior to the Effective Date, and annually, at each anniversary of the Effective Date (unless, during such year, expiration of the applicable policy occurs first, in which case, on such expiration date), at Blackstone’s written request, Alnylam will supply documentation of such insurance coverage via original certificates of insurance, if applicable. Alnylam will provide Blackstone with a minimum of [***] prior written notice if it is unable to obtain appropriate insurance coverage or if its coverage is canceled, unable to be renewed or materially changed. For clarity, any insurance coverage or the failure to maintain adequate insurance coverage does not limit or reduce Alnylam’s liability under this Agreement. Alnylam will ensure that no subcontractor, including any Permitted Third Party, will continue to perform the work unless such subcontractor is insured as deemed appropriate by Alnylam.

11.3.2 Minimum Requirements. Commencing on the Effective Date and thereafter during the Term (or longer if otherwise stated below), Alnylam will maintain the following types of insurance coverage at a minimum level that is the greater of (a) on a country-by-country basis, the minimum level required by Applicable Law in the applicable country in which the Product Clinical Trials and other obligations hereunder are being performed or (b) the following minimum amounts (to the extent different).

11.3.2.1 Commercial General Liability: Five Million U.S. Dollars (\$5,000,000) per occurrence; Five Million U.S. Dollars (\$5,000,000)

Product and Completed Operations aggregate, including Premises & Operations, Personal Injury, Product and Completed Operations; Five Million U.S. Dollars (\$5,000,000) combined single limit on all owned, non-owned and hired vehicles of Alnylam.

11.3.2.2 Umbrella Excess Liability: Eight Million U.S. Dollars (\$8,000,000) per occurrence.

11.3.2.3 Clinical Trials Liability: Ten Million U.S. Dollars (\$10,000,000) per occurrence. Alnylam will obtain such Clinical Trials Liability insurance on a global basis, and, if required, supplemented Clinical Trials Liability Insurance in the US, at its expense. Coverage must be maintained for as long as required by Applicable Law in each country after release of the last Subject from the Product Clinical Trials or where there is no legal requirement at least five (5) years after the termination of this Agreement.

11.3.2.4 Professional Liability: Any subcontractor, including any Permitted Third Party, who provides professional services to Alnylam for the Product Clinical Trials, will obtain Professional Liability Insurance in lieu of Clinical Trial Insurance or will be covered by a global professional liability policy maintained by Alnylam, in either case with a minimum limit of Two Million U.S. Dollars (\$2,000,000) per occurrence. Coverage must be maintained for at least three (3) years after the later of (i) expiration or early termination of this Agreement and (ii) release of the last Subject from the Product Clinical Trials.

11.3.3 Product Liability Insurance. Alnylam will be responsible for maintaining product liability insurance related to the Development and Commercialization of the Products at its expense.

ARTICLE 12

REPRESENTATIONS AND WARRANTIES

12.1 Representations, Warranties and Covenants of Both Parties.

12.1.1 Each Party hereby represents and warrants that it has the requisite corporate power and authority to enter into this Agreement and that this Agreement constitutes a legal and valid obligation binding upon such Party, enforceable in accordance with its terms.

12.1.2 Each Party hereby represents and warrants that it is not a party to any agreement that would prevent it from fulfilling its obligations under this Agreement.

12.1.3 Each Party hereby represents that the execution, delivery and performance of this Agreement and each of the other Transaction Agreements have been

duly authorized by all necessary corporate or other organizational action, and do not and will not (a) contravene the terms of any of such Person's organizational documents; (b) conflict with or result in any breach or contravention of, or the creation of (or the requirement to create) any lien or encumbrance under, or require any payment to be made under (i) any contractual obligation to which such Person is a party or affecting such Person or the properties of such Person or any of its subsidiaries (including, without limitation, the Term Loan Agreement) or (ii) any order, injunction, writ or decree of any governmental authority or any arbitral award to which such Person or its property is subject; or (c) violate any Applicable Law, except in the case of this Section 12.1.3 with respect to Alnylam, as would not reasonably be expected to have a material adverse effect on Alnylam's ability to satisfy its obligations under this Agreement.

12.2 Additional Alnylam Representations, Warranties and Covenants. Alnylam provides the following representations, warranties and covenants, in each case, except as set forth in Exhibit F.

12.2.1 Licensure, Registration and Accreditation. Alnylam hereby represents and warrants that it is licensed, registered, or otherwise qualified under all Applicable Laws to do business in each jurisdiction where such licenses, registrations or other qualifications are required, except as would not be reasonably expected to have a Material Adverse Effect.

12.2.2 No Event of Default under Term Loan Agreement. Alnylam hereby represents, warrants and covenants that to Alnylam's Knowledge no "Event of Default" (as such term is defined in the Term Loan Agreement) has occurred or will occur.

12.2.3 Existing Licenses.

12.2.3.1 Maintenance of Existing Licenses. Alnylam represents and warrants that there has not been, and covenants that there will not be during the Term, any material breach or default by Alnylam under the Existing Licenses which has not been or will not be, as applicable, timely cured as permitted thereunder, and that the Existing Licenses are and will continue to be in full force and effect during the Term. During the Term, Alnylam will: (a) not take any action that would entitle an Existing Licensor to terminate any Existing License, (b) promptly take such actions as are necessary to cure any breach that would entitle an Existing Licensor to terminate an Existing License; and (c) not amend, modify, supplement, restate, waive, cancel or terminate (or consent to any cancellation or termination of), in whole or in part, any provision of or right under the Existing Licenses, or assign, in whole or in part, the Existing Licenses or any provision thereof or right thereunder, without the prior written consent of Blackstone, such consent not to be unreasonably withheld, conditioned or delayed. There are no circumstances that exist as of the Effective Date that would reasonably be expected to give rise to a breach or default under any Existing License by Alnylam, or to Alnylam's Knowledge, by an Existing Licensor.

12.2.3.2 [***]

12.2.3.3 No Other Agreements. Other than the Existing Licenses and the Term Loan Agreement, there are no other agreements to which Alnylam is a party that are related to, or pursuant to which Alnylam has obtained or granted rights regarding, the Products.

12.2.4 Anti-Corruption. Alnylam agrees, on behalf of itself and its Representatives, that for the performance of its obligations hereunder:

12.2.4.1 Alnylam, its Affiliates and its and their respective Representatives will comply with the Anti-Corruption Laws and will not take any action that will, or would reasonably be expected to, cause Blackstone or its Affiliates to be in violation of any Anti-Corruption Laws; and

12.2.4.2 To the extent legally permitted, Alnylam will promptly provide Blackstone with written notice of the following events: (a) upon becoming aware of any material breach or violation by Alnylam, its Affiliate or any of its or their respective Representatives of any representation, warranty or undertaking set forth in Section 12.2.4.1, or (b) upon receiving a formal notification that it is the target of a formal investigation by a Governmental Authority for a Material Anti-Corruption Law Violation or upon receipt of information from any of its Representatives connected with this Agreement that any of them is the target of a formal investigation by a governmental authority for a Material Anti-Corruption Law Violation.

12.2.5 Debarment. Alnylam hereby represents that neither it, nor its Affiliates, nor to its Knowledge any Permitted Third Parties engaged by it to perform activities in relation to the Products are debarred under subsections 306(a) or (b) of the U.S. Federal Food, Drug, and Cosmetic Act (US Generic Drug Enforcement Act of 1992; 21 USC 335a (a) or (b)), and that it has not and will not knowingly use in any capacity the services of any Person or Permitted Third Party debarred under this law to conduct the Product Clinical Trials. Alnylam further certifies that neither it, nor any of its Affiliates are excluded from any federal health care program, including but not limited to Medicare and Medicaid. Alnylam will notify Blackstone immediately if either of these certifications needs to be amended in light of new information.

12.2.6 Clinical Trial Permits; Certifications; Authorizations. Alnylam further covenants that it and its Permitted Third Parties have, or will have at the required times, such INDs or other filings with all Regulatory Authorities as are required to conduct the Product Clinical Trials and perform any and all of their material obligations in connection with the Product Clinical Trials supervised by it. All such INDs and other filings are valid and in full force and effect. Alnylam has not received any notice that the FDA, other Regulatory Authority, institutional review board or independent ethics committee, has initiated, or

threatened to initiate, any action to suspend or terminate any IND or otherwise restrict the preclinical or clinical research of any Product.

12.2.7 Disclosure of Regulatory Notices and Communications. Alnylam hereby represents and warrants that, as of the Effective Date, all material regulatory communications and, if any, notices of inspection, inspection reports, warning letters and deficiency letters related to the Products made available by Alnylam in the Data Room were true and complete copies of such documents. Alnylam hereby represents and warrants that such documents comprise all material written regulatory communications related to the Products from all Regulatory Authorities in the possession of Alnylam as of the Effective Date.

12.2.8 Serious Safety Issues. To Alnylam's Knowledge, Alnylam has not received any verbal or written notice of the occurrence of any Serious Safety Issue in the Product Clinical Trials.

12.2.9 Compliance. Alnylam represents and warrants that, prior to the Effective Date, (a) it has conducted all preclinical and clinical activities related to the development of the Products in material compliance with Applicable Laws, including GLP and GCP, and (b) to Alnylam's Knowledge, all Third Parties utilized by Alnylam to perform any portion of the preclinical and clinical activities have conducted such portion of such preclinical activities in material compliance with Applicable Laws. Alnylam will manufacture or have manufactured the Products for the Product Clinical Trials in accordance with GMP.

12.2.10 Intellectual Property. Alnylam hereby represents and warrants that, as of the Effective Date, Alnylam owns or possesses sufficient legal rights to all patents, trademarks, service marks, trade names, copyrights, trade secrets, information, proprietary rights and processes necessary for the Development, manufacture and Commercialization of the Products without, to Alnylam's Knowledge, any conflict with or infringement of the rights of any Third Party. To Alnylam's Knowledge, the Development, manufacture and Commercialization of the Products by Alnylam does not violate and will not violate any license and does not and will not infringe any intellectual property rights of any Third Party. Except as set forth in the Existing Licenses, there are no outstanding options, licenses or agreements of any kind granted by Alnylam relating to the Development, manufacture or Commercialization of the Products. Alnylam has not received any communications alleging that Alnylam has violated, or that the Development, manufacture or Commercialization of the Products would violate, any of the patents, trademarks, service marks, trade names, copyrights, trade secrets or other proprietary rights of any Third Party. Schedule 12.2.10 hereto sets forth an accurate and complete list of all issued patents and patent applications included in the Alnylam Intellectual Property that, to Alnylam's Knowledge, cover or claim the Products or their use, manufacture or sale (the "Product Patents"). For each Product Patent, Alnylam has indicated (i) the jurisdiction in which such Patent Right is pending, allowed, granted or issued, (ii) the patent number or patent application serial number, (iii) the

owner of such Patent, and (iv) the expiration date of such Patent. To Alnylam's Knowledge, the Product Patents that have been issued or granted by the applicable patent office are valid and enforceable, and Alnylam has not received any written notice or legal opinion, whether preliminary in nature or qualified in any manner, which concludes that a challenge to the validity or enforceability of any of the issued Product Patents may succeed. Alnylam has not received any claim or notice challenging, or threatening to challenge, the ownership of, or rights of Alnylam in and to or the validity or enforceability of the Product Patents. To Alnylam's Knowledge, Alnylam has not committed any act, or failed to commit any required act that would reasonably be expected to cause any Product Patent to expire prematurely, lapse or be declared invalid or unenforceable, or that estops the enforcement of such Product Patent against any Third Party.

12.2.11 Alnylam Data Provided as of the Effective Date. Alnylam hereby represents and warrants that, up to and as of the Effective Date, (i) the CMC Information set forth in the Data Room is accurate in all material respects, (ii) the descriptions of, Protocols for, and data and other results of, the Product Clinical Trials conducted by or on behalf of Alnylam set forth in the Data Room are accurate in all material respects and (iii) the summaries of primary data regarding the Products set forth in the Data Room are accurate in all material respects.

12.3 Blackstone Representation, Warranty and Covenant. Blackstone hereby represents, warrants and covenants that it will have, as and when needed, sufficient funds to satisfy its obligations hereunder.

12.4 DISCLAIMER OF REPRESENTATIONS AND WARRANTIES.

12.4.1 Each Party hereby agrees and understands that because the Product Clinical Trials and the Products are experimental in nature, the outcome is inherently uncertain and unpredictable. Each Party hereby agrees and understands that the other Party makes no representation, guarantee or warranty, express or implied, regarding the outcome of the Product Clinical Trials (including achievement of the Phase 2 Success Criteria, the Phase 3 Success Criteria or the Success Payment Triggers), any Research Results generated after the Effective Date, the ability to obtain Regulatory Approval or the patentability, legal protectability or usefulness of any Intellectual Property arising from the Product Clinical Trials.

12.4.2 EXCEPT AS OTHERWISE SET FORTH IN THIS Article 12, NEITHER PARTY MAKES, AND EACH PARTY EXPRESSLY DISCLAIMS, ANY REPRESENTATION OR WARRANTY OF ANY KIND WITH RESPECT TO THE SUBJECT MATTER OF THIS AGREEMENT, EITHER ORAL OR WRITTEN, EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING ANY REPRESENTATION OR WARRANTY REGARDING THE USE, RESULTS OR EFFICACY OF THE PRODUCTS.

ARTICLE 13

TERM; CLOSING CONDITIONS; AND TERMINATION

13.1 Term. The term of this Agreement (the “Term”) will commence on the Effective Date and will expire upon the earliest of (i) termination of this Agreement in accordance with Section 13.3, or (ii) the date of payment of the later of the last Success Payment or Royalty payment.

13.2 Pre-Signing Conditions.

13.2.1 IP Security Agreement. On or before the Effective Date, Alnylam will (a) execute and deliver to Blackstone an IP Security Agreement(s) as set forth in Section 7.4.1(a), (b) record such agreement with the U.S. Patent and Trademark Office and provide sufficient evidence to Blackstone that such filing(s) have been made, and (c) take such other action as may be necessary or as Blackstone may reasonably request to perfect Blackstone’s security interest in any Intellectual Property of Alnylam in existence as of the Effective Date constituting Blackstone Collateral.

13.2.2 Intercreditor Agreement. On or before the Effective Date, Blackstone and Wilmington Trust as the Collateral Agent will enter into the Intercreditor Agreement, which Intercreditor Agreement will be acknowledged and consented to by Alnylam.

13.2.3 Proof of Insurance. Prior to the Effective Date, Alnylam will supply documentation of insurance coverage via original certificates of insurance, if applicable, in accordance with Section 11.3.

13.2.4 Opinion. On the Effective Date, Alnylam will deliver to Blackstone an executed opinion of counsel, dated as of the date hereof, solely with respect to the creation of a security interest in the Blackstone Collateral and the perfection of such security interest upon the proper filing of a UCC-1 financing statement.

13.3 Termination.

13.3.1 Termination for Breach.

13.3.1.1 Generally. Either Party may terminate this Agreement immediately, either in its entirety or with respect to a Product, in the event of a material breach of this Agreement by the other Party provided that the breaching Party has received written notice from the non-breaching Party of such breach, specifying in reasonable detail the particulars of the alleged breach and such breach has not been cured within [***] after the date of the relevant notice. The non-breaching Party will have the right to pursue remedies it may have at law or equity for such breach, including the right to seek damages from the breaching Party. For the avoidance of doubt, a breach by Alnylam of applicable Anti-Corruption

Laws will be considered a material breach of this Agreement for which Blackstone will have a termination right under this Section 13.3.1.

13.3.1.2 By Blackstone. In the event that Blackstone terminates this Agreement pursuant to this Section 13.3.1 then Alnylam will pay Blackstone, within [***] of the date of termination, an amount equal to the full MoIC of Development Costs actually paid by Blackstone for the terminated Product(s) prior to the effective date of such termination. If Alnylam elects to continue Development of the terminated Product(s) and obtains Regulatory Approval following such termination, Alnylam will remain obligated to pay to Blackstone the Royalty (as applicable) for the terminated Product(s) that become due and payable pursuant to Section 6.1.1.2 at such time as such Royalty payments become due and payable (if ever).

13.3.1.3 By Alnylam. In the event that Alnylam terminates this Agreement pursuant to this Section 13.3.1 then all payment obligations of Alnylam hereunder, including pursuant to Article 6, shall terminate as of the date of such termination, and Alnylam will not be required to make any payment to Blackstone with respect to any Development Costs paid by Blackstone for the terminated Product(s).

13.3.2 Termination by Blackstone for Material Adverse Event. Blackstone may terminate this Agreement, in its entirety or with respect to a Product, at any time in the event that either subsection (a) or (b) of the definition of Material Adverse Event is met, immediately upon written notice to Alnylam. In the event that Blackstone terminates this Agreement pursuant to this Section 13.3.2, then, Alnylam will pay Blackstone an amount equal to one-hundred percent (100%) of the Development Costs actually paid by Blackstone for the terminated Product(s) as of the effective date of such termination. For clarity, Alnylam will not be obligated to pay to Blackstone any Success Payments or Royalties for the terminated Product(s) following the effective date of such termination.

13.3.3 Termination for Failure to Receive Regulatory Approval.

13.3.3.1 Failure to Obtain Regulatory Approval. This Agreement will, upon written notice from either Party to the other Party, terminate with respect to one or both Products (as applicable) with no further action from either Party, if the applicable Product(s) has not received Regulatory Approval in any Major Market Country following completion of the Product Clinical Trials for such Product(s), Alnylam's submission of applications for Regulatory Approval in the Major Market Countries, and Alnylam's use of Commercially Reasonable Efforts to obtain such Regulatory Approvals. For the avoidance of doubt, if Regulatory Approval is received in any Major Market Country, then this Agreement may not thereafter be terminated pursuant to this Section 13.3.3.1.

13.3.3.2 Development Program Failure. Blackstone will have the right to terminate this Agreement upon written notice to Alnylam with respect to one or both Products (as applicable) with no further action from either Party with respect to the applicable Product, if (a) the JSC elects to discontinue such Development Program in its entirety, or (b)(i) with respect to Vutrisiran, the HELIOS-B Trial, or (ii) with respect to ALN-AGT, the ALN-AGT Phase 2 Trial or the ALN-AGT Phase 3 Trial, is completed or terminated and either (A) the primary endpoint in such trial is not achieved, or (B) Blackstone reasonably determines that the Research Results of such trial do not support Regulatory Approval. For the avoidance of doubt, if an application for Regulatory Approval of a Product is accepted for filing by a Regulatory Authority in any Major Market Country then this Agreement may not thereafter be terminated pursuant to this Section 13.3.3.2 for such Product.

13.3.3.3 In the event that this Agreement is terminated pursuant to this Section 13.3.3, then, if Alnylam elects to continue Development of the terminated Product(s) and obtains Regulatory Approval in a Major Market Country following such termination, Alnylam will remain obligated to pay to Blackstone the Royalty (as applicable) and make any Success Payments for such terminated Product(s) that become due and payable pursuant to Article 6 at such time that such payments become due and payable (if ever) pursuant to Article 6, provided that such Success Payments will be adjusted as set forth in Section 6.2.

13.3.4 Termination for Bankruptcy. Either Party may terminate this Agreement in its entirety upon written notice to the other Party if the other Party makes an assignment for the benefit of creditors, or commences a case or proceeding under any bankruptcy, reorganization, insolvency, or similar laws, has a trustee or receiver or similar officer of any court appointed for such Party, or for substantial part of the property of such Party, or bankruptcy, reorganization, insolvency, or liquidation proceedings are instituted by or against such Party without such proceedings being dismissed, in each of the foregoing cases for a period of at least [***].

13.3.4.1 In the event that Alnylam terminates this Agreement pursuant to this Section 13.3.4, then, if Alnylam elects to continue Development of either or both Products and obtains Regulatory Approval following such termination for either or both Products, then Alnylam will remain obligated to pay to Blackstone the Royalty (as applicable) and any Success Payments for the applicable Product(s) that become due and payable pursuant to Article 6 at such time as such Success Payments become due and payable (if ever) pursuant to Article 6, provided that such Success Payments will be adjusted as set forth in Section 6.2.

13.3.4.2 In the event that Blackstone terminates this Agreement pursuant to this Section 13.3.4, then, Alnylam will pay Blackstone within [***] of the date of termination [***]. If Alnylam elects to continue Development of

the terminated Product(s) and obtains Regulatory Approval following such termination, Alnylam will remain obligated to pay the Royalty (as applicable) for the terminated Product(s) that become due and payable pursuant to Article 6 at such time as such Royalty payments become due and payable (if ever) pursuant to Article 6.

13.3.5 Termination for a Licensing Transaction or Change of Control of Alnylam. Blackstone may, in its sole discretion, terminate this Agreement in its entirety or with respect to the applicable Product at any time within [***] following (a) a determination pursuant to Section 3.8 that a Change of Control of Alnylam that occurs prior to the date of payment by Alnylam of the final applicable Success Payment owed to Blackstone pursuant to Article 6 will have a Material Impact, or (b) a determination by the arbitrator pursuant to Section 3.7 that a Licensing Transaction will have a Material Impact. In the event that Blackstone terminates this Agreement pursuant to this Section 13.3.5, Alnylam will pay to Blackstone within [***] of the date of termination [***]. Alnylam or its successor or licensee (whose performance will be guaranteed by Alnylam) will be obligated to continue to exercise Commercially Reasonable Efforts to Develop the Products as set forth herein. If, following such Change of Control or Licensing Transaction, Regulatory Approval is obtained for a Product, then Alnylam (or its successor or licensee) will remain obligated to pay the Royalty (as applicable) and any Success Payments that become due and payable pursuant to Article 6 at such time as such Success Payments become due and payable (if ever) pursuant to Article 6 (except to the extent that Alnylam has accelerated any such payments pursuant to Section 6.6), provided that such Success Payments will be adjusted as set forth in Section 6.2, and will be reduced by the amount previously paid to Blackstone as set forth in this Section 13.3.5.

13.3.6 Termination for Safety Concerns. Either Party may terminate this Agreement with respect to a Product upon written notice to the other Party if (a) the IDMC for a Product Clinical Trial recommends termination of such Product Clinical Trial for reasons pertaining to the health or safety of the Subjects or for futility, or (b) the Parties mutually agree that a material health or safety concern with respect to the Subjects exists. In the event that this Agreement terminates pursuant to this Section 13.3.6, then if Alnylam elects to continue Development of the terminated Product(s) and obtains Regulatory Approval in a Major Market Country following such termination, Alnylam will remain obligated to pay to Blackstone the Royalty (as applicable) and make any Success Payments for such terminated Product(s) that become due and payable pursuant to Article 6 at such time that such payments become due and payable (if ever) pursuant to Article 6, provided that such Success Payments will be adjusted as set forth in Section 6.2. Notwithstanding the foregoing, if this Agreement terminates pursuant to this Section 13.3.6 and such termination: (i) arises as a result of gross negligence on the part of Alnylam; or (ii) is due to (x) the applicable IDMC recommending termination of the applicable Product Clinical Trial or (y) Alnylam and Blackstone mutually agreeing to terminate the applicable Product Clinical Trial, in either case ((x) or (y)), due to a Serious Safety Issue that was previously known,

demonstrated or identified by Alnylam as being material as of the Effective Date and the material data showing, demonstrating, or identifying such Serious Safety Issue were not included in the Data Room, disclosed in writing to Blackstone or otherwise publicly known prior to the Effective Date; then, in either case ((i) or (ii)), Alnylam will pay Blackstone within [***] of the date of termination [***] and if Alnylam elects to continue the Development of the terminated Product(s) and obtains Regulatory Approval for such terminated Product(s) following such termination, then Alnylam will remain obligated to pay to Blackstone the Royalty (as applicable) for the terminated Product(s) that becomes due and payable pursuant to Article 6 at such time as such Royalty payments become due and payable (if ever) pursuant to Article 6.

13.3.7 Termination Because of Adverse Patent Impact. Blackstone may terminate this Agreement, solely with respect to Vutrisiran, if Alnylam is enjoined from further Developing or Commercializing Vutrisiran in any of the Major Market Countries based on an allegation that Vutrisiran infringes a patent of a Third Party (an “Adverse Patent Impact”), upon written notice to Alnylam if Alnylam does not cure such Adverse Patent Impact within a period of [***] from the date of Blackstone’s notice to Alnylam of an Adverse Patent Impact. In the event that Blackstone terminates this Agreement pursuant to Section 13.3.7, then Alnylam will pay Blackstone within [***] of the date of termination [***] provided that, Alnylam will remain obligated to pay the Royalty that becomes due and payable pursuant to Section 6.1.1.2 at such time as such Royalties become due and payable (if ever) pursuant to Section 6.1.1.2 (except to the extent that Alnylam has repurchased any such payments pursuant to Section 6.6.2).

13.4 Additional Consequences of Termination.

13.4.1 Release of Security Interest. Upon any termination of this Agreement and payment by Alnylam of all amounts specified as being payable upon such termination in Section 13.3 (other than a termination pursuant to Section 13.3.2, in which case Blackstone’s security interest will not be released until the earlier of such time as conditions exist that would have permitted this Agreement to be terminated under Section 13.3.3 or 13.3.5 in the absence of such termination under Section 13.3.2 or such time as Alnylam has made all Success Payments that become payable pursuant to 13.3.2) excluding Success Payment amounts, Blackstone will and hereby does release the security interest granted by Alnylam to Blackstone pursuant to Article 7. Blackstone agrees to sign such further releases and other documents and take such further actions as may be necessary or desirable, in Alnylam’s reasonable judgment and at Alnylam’s request, to more fully give effect to such release.

13.4.2 [***]

13.5 Surviving Obligations.

13.5.1 Accrued Rights and Obligations. Expiration or termination of this Agreement for any reason will not release either Party from any obligation or liability which,

at the time of such expiration or termination, has already accrued to the other Party or which is attributable to a period prior to such expiration or termination.

13.5.2 Surviving Obligations. The following provisions of this Agreement, together with any other provisions that expressly specify that they survive, will survive expiration or earlier termination of this Agreement: Article 1, Article 6 (but only following termination (not expiration) and only to the extent payments of Success Payments and Royalties are contemplated following such termination in accordance with the terms of the applicable subsection of Section 13.3), Article 7 (such provisions surviving only until such time as the security interest granted by Alnylam to Blackstone pursuant to Article 7 is released, whether pursuant to Section 13.4.1 or otherwise, provided that the survival of Section 7.5 shall be as set forth in Section 7.5.11), Article 8 (other than Section 8.2), Article 9, Article 11, Section 10.1, Section 13.3 (to the extent relating to post-termination rights and obligations of the Parties), Section 13.4, Section 13.5, Section 14.3, Section 14.4, Section 14.5, Section 14.6, Section 14.9, Section 14.10, Section 14.11, Section 14.12, Section 14.14, Section 14.17, Section 14.20.

ARTICLE 14

MISCELLANEOUS

14.1 Relationship with Affiliates. Each Party will be responsible for any breach by its Affiliates of its obligations in connection with this Agreement, and each such Party will remain responsible for any responsibilities that it has delegated to an Affiliate as though such Party had performed (or failed to perform) such responsibilities itself.

14.2 Prior Agreements. The Parties hereby agree that the Confidentiality Agreement is hereby terminated and superseded by this Agreement and that all Information related to the Product(s) disclosed under or pursuant to the Confidentiality Agreement will constitute Confidential Information disclosed pursuant to this Agreement and will be subject to the terms of Article 9, with the confidentiality and non-use provisions of Article 9 applying retroactively to such Confidential Information from the date of disclosure.

14.3 Notices. Any notice or other communication required or permitted to be given by either Party under this Agreement will be in writing and will be effective when delivered if delivered by fax, e-mail, hand, reputable courier service, or five (5) days after mailing if mailed by registered or certified mail, postage prepaid and return receipt requested, addressed to the other Party at the following addresses or such other address as may be designated by notice pursuant to this Section 14.3:

14.3.1 If to Alnylam:

Alnylam Pharmaceuticals, Inc.
675 West Kendall Street, Henri A. Termeer Square
Cambridge, MA 02142

Attn: Jeff Poulton
[***]

with a copy, which will not constitute notice, to:

Alnylam Pharmaceuticals, Inc.
675 West Kendall Street, Henri A. Termeer Square
Cambridge, MA 02142
Attn: Laurie Keating
[***]

And to:

Goodwin Procter LLP
601 Marshall Street
Redwood City, CA 94063
Attn: Shane Albright
[***]

14.3.2 If to Blackstone:

BXLS V Bodyguard – PCP L.P.
c/o Blackstone Life Sciences
101 Main Street
Suite 1210
Cambridge, MA 02142
Attn: Craig Shepherd
[***]

with a copy, which will not constitute notice, to:

Blackstone Life Sciences
101 Main Street
Suite 1210
Cambridge, MA 02142
Attn: Julie Constable
[***]

And to:

Ropes & Gray LLP
800 Boylston Street
Prudential Tower
Boston, MA 02199
Attn: Michael Beauvais

[***]

14.4 Force Majeure. Neither Party will be liable for any breach or delay in performance of any obligation under this Agreement to the extent caused by any of the following: war, terrorism, riot, fire, explosion, accident, flood, earthquake, storm or other catastrophe, epidemic, pandemic (including with respect to COVID-19), voluntary or involuntary compliance with any regulation, law or order of any government (including quarantine, shelter-in-place, cessation of business activity, or similar or related directive), any other public health crisis, failure or default of public utilities or common carriers, destruction of production facilities, civil commotion, strike or lockout, sabotage, changes in Applicable Laws, actions of Governmental Authorities, or any other event beyond the reasonable control of such Party (each, a “Force Majeure Event”). The Party invoking this Section 14.4 must provide prompt written notice and full particulars of such event to the other Party and will use diligent and commercially reasonable efforts to mitigate the effects of any such Force Majeure Event on such Party’s compliance with and performance under this Agreement.

14.5 Use of Names. Except as required by Applicable Law, neither Party will use the other Party’s nor any of its Affiliates’ (including the limited partners of Blackstone’s or its Affiliates’, Representatives, partners, managers, directors, board members, members, officers, funds, employees or agents) names or trademarks (including, with respect to Blackstone, any reference to “Blackstone” or “The Blackstone Group”) in any promotional materials, advertising, marketing, endorsement, promotional or sales literature, publicity, public announcement or disclosure in any document employed to obtain funds or financing without the prior written consent of the other Party except as otherwise expressly permitted in this Agreement or as required by Applicable Law. Notwithstanding the foregoing, Blackstone may use the name, logos, and other insignia of Alnylam in any “tombstone” or other advertisements, in its publications, marketing or promotional materials to existing and prospective investors and otherwise on the website or in other marketing materials of Blackstone, as applicable, without Alnylam’s prior approval.

14.6 Assignment. The provisions of this Agreement shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and permitted assigns. Except as permitted herein, Alnylam may not assign, delegate or otherwise transfer this Agreement or any of its interests, obligations or rights hereunder without the prior written consent of Blackstone, and any such purported assignment, delegation or transfer without such consent will be void ab initio and of no effect, provided that Alnylam may assign this Agreement, without such consent of Blackstone, to an Affiliate or to any Third Party that acquires all or substantially all of Alnylam’s business, whether by merger, sale of assets or otherwise, as long as such assignee agrees in a writing to be bound by all the provisions of this Agreement as if such assignee were Alnylam under this Agreement. Alnylam shall give notice to Blackstone of any assignment for which consent was not

required by Blackstone promptly after the occurrence thereof, and, in the case of an assignment to an Affiliate, Alnylam shall remain liable to Blackstone for its obligations to Blackstone hereunder (and Blackstone shall be entitled to seek recovery for any breach or default of an obligation hereunder from Alnylam or from such Affiliate assignee). Blackstone may assign any of its obligations and rights hereunder, without restriction and without the consent of Alnylam if (a) Blackstone notifies Alnylam at least [***] prior to any such assignment, (b) any such assignee, as a condition precedent to such assignment, agrees in writing with Alnylam to be bound by the obligations of Blackstone contained in this Agreement, (c) notwithstanding any such assignment, Blackstone remains liable to Alnylam for its obligations to Alnylam hereunder (and Alnylam shall be entitled to seek recovery for any breach or default of an obligation hereunder from Blackstone or from such assignee) and (d) in any event, such assignment shall be of the Agreement in its entirety. Notwithstanding the foregoing, Blackstone may assign its right to receive Success Payments in whole or in part, without restriction and without the consent of Alnylam.

14.7 Further Assurances. The Parties will execute such further reasonable documents and perform such further reasonable acts as may be necessary to comply with or more fully effectuate the terms of this Agreement.

14.8 Fees and Expenses. Each Party to this Agreement will bear its own costs and expenses, including attorneys' fees and expenses, in connection with the closing of the transactions contemplated hereby. Following a breach or default hereunder by Alnylam, Alnylam shall reimburse Blackstone for its costs and expenses (including legal fees) incurred in collecting the Alnylam Obligations, enforcing the Blackstone Security Interests, or in connection with any bankruptcy or insolvency proceeding commenced by or against Alnylam.

14.9 Governing Law. The construction and validity of this Agreement and the provisions hereof, and the rights and obligations of the Parties hereunder, will be governed by the internal laws of the State of New York, and, to the extent applicable to Patents and Trademarks, the applicable federal laws of the U.S., in each instance without regard to conflict of laws principles.

14.10 Dispute Resolution. The Parties recognize that disputes as to certain matters relating to this Agreement may arise from time to time. It is the objective of the Parties to establish procedures to facilitate the resolution of disputes in an expedient manner by mutual cooperation and without resort to litigation. Accordingly, the Parties agree that any dispute, controversy or claim arising under, out of or in connection with this Agreement, including any subsequent amendments, or the validity, enforceability, construction, performance or breach hereof (and including the applicability of this Section 14.10 to any such dispute, controversy or claim) (each a "Dispute") will be resolved exclusively as follows:

14.10.1 Either Party will have the right to refer such Dispute to the Executive Officers for attempted resolution by good faith negotiations for a period of [***].

Any final decision mutually agreed to by the Executive Officers in writing will be conclusive and binding on the Parties. With respect to any Dispute that remains unresolved after the expiration of [***] after a Dispute is notified to the Executive Officers, then such Dispute will be submitted by the Party seeking to resolve such dispute to the AAA for final and binding arbitration pursuant to the arbitration clause set forth in Section 14.10.2. Notwithstanding the foregoing, no matters relating to breach or alleged breach of the ownership of Intellectual Property or rights in Intellectual Property or the validity or enforceability thereof will be resolved by arbitration, but rather will be determined by a U.S. federal court of appropriate jurisdiction in New York, New York, or, in the absence of federal court jurisdiction, the state courts of the State of New York. Notwithstanding the foregoing, any dispute between the Parties as to whether entering into a Licensing Transaction would have a Material Impact will be resolved as set forth in Section 3.7. Notwithstanding anything in this Agreement to the contrary, either Party will be entitled to seek preliminary injunctive relief in any court of competent jurisdiction immediately if necessary to prevent irreparable harm to that Party.

14.10.2 Arbitration Process.

14.10.2.1 Either Party will have the right to initiate arbitration at any time after the expiration of [***] after a Dispute is notified to the Executive Officers. Any disputes concerning the propriety of the commencement of the arbitration will be finally settled by the arbitral tribunal.

14.10.2.2 Any Dispute including the determination of the scope or applicability of this agreement to arbitrate, will be determined by arbitration in New York in the English language. The arbitration will be administered by the AAA pursuant to its arbitration rules and procedures. References herein to any arbitration rules or procedures mean such rules or procedures as amended from time to time, including any successor rules or procedures, and references herein to the AAA include any successor thereto. The arbitration will be before a tribunal comprised of three (3) arbitrators. Each Party will select one arbitrator and within [***] of the second arbitrator's appointment, the two (2) Party appointed arbitrators will select the third, who will serve as the tribunal's chair or president. All three (3) arbitrators will be professionals with substantial experience in development and Commercialization of biopharmaceutical products. An arbitrator will be deemed to meet these qualifications unless a Party objects within [***] after the arbitrator is appointed. This arbitration provision, and the arbitration itself, will be governed by the Federal Arbitration Act, 9 U.S.C. §§ 1 *et. seq.*

14.10.2.3 Consistent with the expedited nature of arbitration, each Party will, upon the written request of the other Party, promptly provide the other with copies of documents on which the producing Party may rely in support of or in opposition to any claim or defense. At the request of a Party, the arbitrators will have the discretion to order examination by deposition of witnesses to the extent

the arbitrator deems such additional discovery relevant and appropriate. Depositions will be limited to a maximum of [***] per Party and will be held within [***] after the grant of a request. Additional depositions may be scheduled only with the permission of the arbitrators, and for good cause shown. Each deposition will be limited to a maximum of [***]. All objections are reserved for the arbitration hearing except for objections based on privilege and proprietary or confidential information. The Parties will not utilize any other discovery mechanisms, including international processes and U.S. federal statutes, to obtain additional evidence for use in the arbitration. Any Dispute regarding discovery, or the relevance or scope thereof, will be determined by the arbitrators, which determination will be conclusive. All discovery will be completed within [***] following the appointment of the arbitrators. All costs or fees relating to the retrieval, review and production of electronic discovery will be paid by the Party requesting such discovery.

14.10.2.4 The arbitrators will have no authority to award punitive or other damages not measured by the prevailing Party's actual damages, except as may be required by statute. Each Party expressly waives and foregoes any right to consequential, punitive, special, exemplary or similar damages or lost profits. The arbitrators will have no power or authority to relieve the Parties from their agreement hereunder to arbitrate or otherwise to amend or disregard any provision of this Agreement. The cost of the arbitration, including the fees of the arbitrators and reasonable attorney's fees of the prevailing Party, will be borne by the Party the arbitrator determines has not prevailed in the arbitration.

14.10.2.5 If an arbitral award does not impose an injunction on the losing Party or contain a money damages award in excess of [***] then the arbitral award will be final and binding and will only be subject to such challenges as would otherwise be permissible under the Federal Arbitration Act, 9 U.S.C. § 1 *et. seq.* Judgment on such an award may be entered in any court of competent jurisdiction and the Parties undertake to carry out the award without delay. In the event that an arbitral award imposes an injunction or contains a monetary award in excess of [***] the Parties agree that such award may be appealed pursuant to the AAA's Optional Appellate Arbitration Rules (the "Appellate Rules") and should not be considered to be final and binding until after the time for filing the notice of appeal under the Appellate Rules has expired. Appeals must be initiated within [***] of receipt of the award, as defined by the Appellate Rules, by filing a Notice of Appeal within any AAA office. Following the appeal process, the decision rendered by the appeal tribunal will be final and binding and judgment on that award may be entered in any court of competent jurisdiction and the Parties undertake to carry out the award without delay.

14.10.2.6 Except as may be required by law, or to protect or pursue a legal right to enforce or challenge an award in legal proceedings, where needed for the preparation or presentation of a claim or defense in this arbitration, or

by order of the arbitral tribunal upon application of a Party, neither a Party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both Parties.

14.11 Limitation of Liability. TO THE MAXIMUM EXTENT PERMITTED BY LAW AND NOTWITHSTANDING ANY PROVISION IN THIS AGREEMENT TO THE CONTRARY, NEITHER PARTY WILL BE LIABLE TO THE OTHER PARTY FOR ANY INDIRECT, INCIDENTAL, SPECIAL, RELIANCE OR PUNITIVE DAMAGES OR LOST OR IMPUTED PROFITS OR ROYALTIES OR COST OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, WHETHER LIABILITY IS ASSERTED IN CONTRACT, TORT (INCLUDING NEGLIGENCE AND STRICT PRODUCTS LIABILITY), INDEMNITY OR CONTRIBUTION, AND IRRESPECTIVE OF WHETHER THAT PARTY OR ANY REPRESENTATIVE OF THAT PARTY HAS BEEN ADVISED OF, OR OTHERWISE MIGHT HAVE ANTICIPATED THE POSSIBILITY OF, ANY SUCH LOSS OR DAMAGE. THE PARTIES AGREE THAT THE LIMITATIONS SPECIFIED IN THIS SECTION 14.11 WILL APPLY EVEN IF ANY LIMITED REMEDY SPECIFIED IN THIS AGREEMENT IS FOUND TO HAVE FAILED OF ITS ESSENTIAL PURPOSE. FOR THE AVOIDANCE OF DOUBT, THIS SECTION 14.11 WILL NOT LIMIT (A) ALNYLAM'S OBLIGATION TO PAY BLACKSTONE THE AMOUNTS SET FORTH IN ARTICLE 6 OR SECTION 13.3, OR (B) A PARTY'S LIABILITY RESULTING FROM SUCH PARTY'S (I) GROSS NEGLIGENCE, FRAUD OR WILLFUL MISCONDUCT, (II) BREACH OF Article 9, OR (III) INDEMNIFICATION OBLIGATION PURSUANT TO SECTION 11.1.

14.12 Cumulative Remedies. Unless expressly set forth in this Agreement, all rights and remedies of the Parties, including all rights to payment, rights of termination, rights to injunctive relief, and other rights provided under this Agreement, will be cumulative and in addition to all other remedies provided for in this Agreement, in law, and in equity.

14.13 Relationship of the Parties; Independent Contractors. Nothing contained herein will be deemed to create a partnership, joint venture, or similar relationship between the Parties, including for U.S. federal income and other applicable tax purposes. Neither Party is the agent, employee, joint venturer, partner, franchisee, or representative of the other Party. Each Party specifically acknowledges that it does not have the authority to, and will not, incur any obligations or responsibilities on behalf of the other Party. Notwithstanding anything to the contrary in this Agreement, each Party (and its officers, directors, agents, employees, and members) will not hold themselves out as employees, agents, representatives, or franchisees of the other Party or enter into any agreements on such Party's behalf.

14.14 No Third Party Beneficiaries. This Agreement and the provisions herein are for the benefit of the Parties only, and are not intended to confer any rights or benefits to any Third Party.

14.15 Rights Reserved. No license or any other right is granted to either Party, by implication or otherwise, except as specifically set forth in this Agreement. All rights not exclusively granted to Blackstone are reserved to Alnylam and its Affiliates. Notwithstanding any other provision of this Agreement to the contrary, and for clarity, no Intellectual Property or other proprietary rights Controlled by Alnylam or its Affiliates will be assigned or licensed to Blackstone in connection with this Agreement.

14.16 Amendments; No Waiver. Unless otherwise specified herein, no amendment, supplement, or modification of this Agreement will be binding on either Party unless it is in writing and signed by both Parties. No delay or failure on the part of a Party in the exercise of any right under this Agreement or available at law or equity will be construed as a waiver of such right, nor will any single or partial exercise thereof preclude any other exercise thereof. All waivers must be in writing and signed by the Party against whom the waiver is to be effective. Any such waiver will constitute a waiver only with respect to the specific matter described in such writing and will in no way impair the rights of the Party granting such waiver in any other respect or at any other time.

14.17 Severability. If any provision (or portion thereof) of this Agreement is determined by a court or arbitration to be unenforceable as drafted by virtue of the scope, duration, extent, or character of any obligation contained herein, it is the Parties' intention that such provision (or portion thereof) will be construed in a manner designed to effectuate the purposes of such provision to the maximum extent enforceable under such Applicable Law. The Parties will enter into whatever amendment to this Agreement as may be necessary to effectuate such purposes.

14.18 Entire Agreement. This Agreement, including all Exhibits hereto and the Transaction Agreements, contains the entire understanding of the Parties and supersedes, revokes, terminates, and cancels any and all other arrangements, understandings, agreements, term sheets, or representations and warranties, whether oral or written, between the Parties relating to the subject matter of this Agreement.

14.19 Counterparts. This Agreement will be executed in two (2) counterparts, one (1) for either Party, which, taken together, will constitute one and the same agreement. This Agreement will not be binding on the Parties or otherwise effective unless and until executed by both Parties.

14.20 Construction. This Agreement has been negotiated by the Parties and their respective counsel. This Agreement will not be construed in favor of or against either Party by reason of the authorship of any provisions hereof.

[Signature Page Follows]

IN WITNESS WHEREOF, the Parties, intending to be legally bound hereby, have caused this Agreement to be executed in duplicate by their duly authorized representatives as of the Effective Date.

ALNYLAM PHARMACEUTICALS, INC.

By: /s/ Yvonne Greenstreet

Name: Yvonne Greenstreet

Title: Chief Operating Officer

Date: 8/14/2020

Signature Page To The Co-Development Agreement

IN WITNESS WHEREOF, the Parties, intending to be legally bound hereby, have caused this Agreement to be executed in duplicate by their duly authorized representatives as of the Effective Date.

BXLS V BODYGUARD – PCP L.P.

By: Blackstone Life Sciences Advisors L.L.C. on behalf of
Blackstone Life Sciences Associates V (CYM) L.L.C.

By: /s/ Robert Liptak
Name: Robert Liptak
Title: Authorized Person

Signature Page To The Co-Development Agreement

IN WITNESS WHEREOF, the Parties, intending to be legally bound hereby, have caused this Agreement to be executed in duplicate by their duly authorized representatives as of the Effective Date.

**BXLS FAMILY INVESTMENT PARTNERSHIP V – ESC
L.P.**

By: BXLS V Side-by-Side GP L.L.C.
Its General Partner

By: /s/ Robert Liptak
Name: Robert Liptak
Title: Authorized Person

Signature Page To The Co-Development Agreement

EXHIBIT LIST

Exhibit A	[***]
Exhibit B	[***]
Exhibit C	[***]
Exhibit D	[***]
Exhibit E	Form of IP Security Agreement
[***]	[***]

Exhibit A

[***]

Exhibit B

[***]

Exhibit C

[**]

Exhibit D

[***]

Exhibit E
Form of IP Security Agreement

**FIRST AMENDMENT
TO CREDIT AGREEMENT**

This FIRST AMENDMENT TO CREDIT AGREEMENT (this “**Amendment**”), is entered into as of August 15, 2020, among Alnylam Pharmaceuticals, Inc., a Delaware corporation (the “**Borrower**”), the Guarantors party hereto, the Lenders party hereto and Wilmington Trust, National Association, solely in its capacity as administrative agent (the “**Administrative Agent**”).

WITNESSETH:

WHEREAS, the Borrower, the Guarantors party thereto from time to time, the Lenders party thereto from time to time and the Administrative Agent are party to that certain Credit Agreement, dated as of April 10, 2020 (the “**Credit Agreement**” and, as amended by this Amendment, the “**Amended Credit Agreement**”; capitalized terms used herein (including in the preamble hereto) that are not otherwise defined herein shall have the respective meanings assigned to such terms in the Amended Credit Agreement);

WHEREAS, the Borrower, BXLS V Bodyguard - PCP L.P. (the “**Co-Development Administrative Agent**”) and certain affiliates of BXLS V Bodyguard - PCP L.P. (together with BXLS V Bodyguard - PCP L.P., the “**Blackstone Co-Development Parties**”) have entered into a Co-Development Agreement, dated as of the date hereof (the “**Co-Development Agreement**”), pursuant to which the Blackstone Co-Development Parties will provide funding to the Borrower for the continued development of Vutrisiran and ALN-AGT, and the obligations of the Borrower under the Co-Development Agreement will be secured by Liens on the Shared Collateral (as defined in the Blackstone Intercreditor Agreement);

WHEREAS, the Co-Development Administrative Agent and the Administrative Agent have entered into a Pari Passu Intercreditor Agreement, dated as of the date hereof (the “**Blackstone Intercreditor Agreement**”), in order to establish the equal priority of the Liens on the Shared Collateral securing the Borrower’s obligations under the Loan Documents and the Co-Development Agreement; and

WHEREAS, in connection with the entry into the Co-Development Agreement and the Blackstone Intercreditor Agreement, the parties wish to amend the Credit Agreement and the Security Agreement as set forth in Section 1 and Section 2, respectively, of this Amendment to provide for, among other things, (a) the inclusion of ALN-AGT as Collateral under the Loan Documents and (b) other appropriate adjustments related thereto.

NOW, THEREFORE, in consideration of the mutual agreements, provisions and covenants contained herein, the parties hereto agree as follows:

SECTION 1. Amendments to Credit Agreement. Upon satisfaction (or waiver by the Lenders) of the conditions set forth in Section 3 hereof, the Credit Agreement is hereby amended as follows:

(a) Section 1.01 of the Credit Agreement is hereby amended by adding the following new definitions in appropriate alphabetical order:

“ALN-AGT” means an RNAi therapeutic product targeting angiotensinogen which, as of the First Amendment Effective Date, is in development by the Borrower for the treatment of hypertension in high unmet need populations.

“ALN-AGT IP Collateral” means any and all Patents, Copyrights, Trademarks, trade secrets and other intellectual property recognized under applicable Law (other than

Patents, Copyrights, Trademarks, trade secrets and other intellectual property recognized under applicable Law consisting of RPA Assets) that are necessary for, and material to, the research, development, manufacture, commercialization, or other exploitation of ALN-AGT, including the Orange Book Patents, in each case, during the term of this Agreement; provided, that, such Patents, Copyrights, Trademarks, trade secrets and other intellectual property recognized under applicable Law shall no longer constitute ALN-AGT IP Collateral following the Discharge of Co-Development Obligations.

“Blackstone Intercreditor Agreement” means that certain Pari Passu Intercreditor Agreement, dated as of the First Amendment Effective Date, between the Administrative Agent and the Co-Development Administrative Agent, as amended, restated, or otherwise modified from time to time.

“Co-Development Administrative Agent” means BXLS V Bodyguard - PCP L.P., a Delaware limited partnership.

“Co-Development Agreement” means that certain Co-Development Agreement, dated as of the First Amendment Effective Date, among the Borrower, the Co-Development Administrative Agent and the Co-Development Secured Parties party thereto.

“Co-Development Obligations” means, at any time, all indebtedness, liabilities and other obligations of the Borrower to the Co-Development Secured Parties under or in connection with the Co-Development Agreement (as in effect on the date hereof) and other documents executed in connection therewith, including, without limitation, all amounts payable to any Co-Development Secured Party pursuant to Article 6 thereof and any and all damages resulting from breach of the Co-Development Agreement by the Borrower, all fees, interest and all other amounts payable by the Borrower to the Co-Development Administrative Agent or any other Co-Development Secured Party thereunder or in connection therewith, whether now existing or hereafter arising, and whether due or to become due, absolute or contingent, liquidated or unliquidated, determined or undetermined. To the extent any payment with respect to the Co-Development Obligations (whether by or on behalf of the Borrower, as proceeds of security, enforcement of any right of set off or otherwise) is declared to be fraudulent or preferential in any respect, set aside or required to be paid or turned over to a debtor in possession, trustee, receiver or similar Person, then the obligation or part thereof originally intended to be satisfied shall be deemed to be reinstated and outstanding as if such payment had not occurred.

“Co-Development Secured Parties” has the meaning assigned to such term in the Blackstone Intercreditor Agreement.

“Discharge of Co-Development Obligations” means the payment in full in cash of all Co-Development Obligations (other than any indemnification obligations for which no claim has been asserted), whether from proceeds of Shared Collateral (as defined in the Blackstone Intercreditor Agreement) or otherwise.

“First Amendment Effective Date” means August 15, 2020.

(b) Section 1.01 of the Credit Agreement is hereby amended by restating the following definitions in their entirety as follows:

“IP Collateral” means the (i) Specified Product IP that is owned by the Loan Parties, (ii) any Replacement Collateral that constitutes IP Rights and (iii) ALN-AGT IP Collateral, in each case of clauses (i) through (iii), other than any RPA Assets or any Shared IP.

“Liquidity” means, at any time, the aggregate amount of unrestricted cash and Cash Equivalents of the Loan Parties at such time maintained in accounts in the United States that is, from and after the date that is 90 days after the Closing Date (or such later date as the Lender Representative may agree), subject to a valid, enforceable and, subject to Liens permitted pursuant to Section 7.01(y), first priority perfected security interest in favor of the Administrative Agent for the benefit of the Secured Parties pursuant to a Qualifying Control Agreement.

“Loan Documents” means, collectively, (a) this Agreement, (b) the Notes, (c) the Guaranty, (d) the Collateral Documents, (e) each Joinder Agreement, (f) the Fee Letter, (g) the Agency Fee Letter, (h) the Paying Agent Agreement, (i) the Nondisturbance Agreement, (j) the Side Letter, (k) the Blackstone Intercreditor Agreement and (l) all other certificates, agreements, documents and instruments executed and delivered, in each case, by or on behalf of any Loan Party pursuant to the foregoing and any amendments, modifications or supplements thereto or to any other Loan Document or waivers hereof or to any other Loan Document; *provided, however*, that for purposes of Section 11.01, “Loan Documents” shall mean this Agreement, the Guaranty and the Collateral Documents.

“Permitted Licenses” means any of the following, now or in the future: (a) any licensing, partnering, collaboration, research, development, manufacturing, and/or commercial transactions to advance one or more Specified Products or ALN-AGT, such as, without limitation, contract manufacturing, contract research, co-promotion, marketing and distribution arrangements; (b) any transactions related to Intellectual Property or any licensing, partnering, collaboration, research, development, manufacturing, and/or commercial transactions with respect to other products or programs (including assignments, other transfers and Dispositions in connection therewith) that, in each case, do not involve any Specified Product or ALN-AGT (even if they involve Intellectual Property and/or inbound licenses applicable to Specified Products or ALN-AGT so long as (i) such Intellectual Property or each of such inbound license is only included in such transactions with respect to products or programs other than Specified Products or ALN-AGT and (ii) no such Intellectual Property and/or inbound licenses are assigned, transferred or otherwise subject to any Disposition with respect to the Specified Products or ALN-AGT); (c) intercompany licenses or grants of rights of distribution, co-promotion or similar commercial rights between or among the Loan Parties; (d) inbound licenses of all or any portion of (x) IP Rights or (y) other rights in respect of one or more Products (or assets that will become Products) and (e) any combination of clauses (a)-(d) above.

“Shared IP” means, as applicable, (x) the Specified Product IP that is applicable to any product or program of the Borrower or its Restricted Subsidiaries other than the Specified Products or, prior to the Discharge of Co-Development Obligations, ALN-AGT and (y) the ALN-AGT IP Collateral that is applicable to any product or program of the Borrower or its Restricted Subsidiaries other than ALN-AGT or the Specified Products.

(c) Section 2.03(b) of the Credit Agreement is hereby amended by restating clause (i) thereof in its entirety as follows:

(i) Dispositions and Involuntary Dispositions. The Borrower shall prepay the Loans in an aggregate amount equal to 100% of the Net Cash Proceeds received by the Loan Parties from all Dispositions pursuant to Section 7.05(f), (h), (i), (j) and (l) (other than Permitted Transfers and Dispositions of ALN-AGT IP Collateral) and Involuntary Dispositions of Collateral (other than ALN-AGT IP Collateral) within ten (10) Business Days of the date of such Disposition or Involuntary Disposition that are in excess of \$10,000,000; provided that, other than with respect to Net Cash Proceeds received in connection with a Disposition or Involuntary Disposition of the Manufacturing Facility, if the Borrower or its Restricted Subsidiaries invest (or commit to invest) the Net Cash Proceeds from such event (or a portion thereof) within 12 months after receipt of such Net Cash Proceeds to acquire, maintain, develop, construct, improve, upgrade, repair or make capital expenditures or Investments with respect to assets or property (x) that constitute Collateral or (y) with respect to which the Administrative Agent, on behalf of the Secured Parties, shall have received a first priority perfected security interest, then no prepayment shall be required pursuant to this paragraph in respect of such Net Cash Proceeds in respect of such event (or the applicable portion of such Net Cash Proceeds, if applicable) except to the extent of any such Net Cash Proceeds therefrom that have not been so invested (or committed to be invested) by the end of such 12-month period (or if committed to be so invested within such 12-month period, have not been so invested within one hundred eighty (180) days after the 12-month period that follows receipt thereof), at which time a prepayment shall be required in an amount equal to such Net Cash Proceeds that have not been so invested (or committed to be invested); provided, further that, if (x) the Borrower or a Restricted Subsidiary has identified Replacement Collateral in writing to the Lender Representative at least five (5) Business Days prior to the date of such Disposition or Involuntary Disposition, and (y) the Administrative Agent, on behalf of the Secured Parties shall have received (or shall receive in connection with the closing of such Disposition or Involuntary Disposition) a first priority perfected security interest in all such Replacement Collateral on or prior to the date of such Disposition or Involuntary Disposition, then no prepayment (or Cash Collateral) shall be required pursuant to this paragraph in respect of such Net Cash Proceeds.

(d) Section 5.23 of the Credit Agreement is hereby amended by restating clauses (b) through (f) thereof in their entirety as follows:

(b) Schedule 5.23(b) sets forth a true, correct and complete listing, under separate headings, of all written Contractual Obligations under which any Loan Party or any of its Restricted Subsidiaries (i) has received a license or other right to practice of use any Specified Product IP or ALN-AGT IP Collateral, that any other Person owns, or (ii) owes any royalties or other payments to any Person for the use of any Specified Product IP or ALN-AGT IP Collateral with respect to any Specified Product or ALN-AGT, as applicable, or (iii) has granted any Person any right or interest in any Specified Product IP with respect to any Specified Product or any ALN-AGT IP Collateral with respect to ALN-AGT in return for royalties or other payments, excluding, in the case of each of clause (i)-(iii), Contractual Obligations that are (x) not material or (y) entered into in the ordinary course of business (which, for the avoidance of doubt, includes investigator-initiated study agreements and material transfer agreements related to research, in both cases entered into in the ordinary course of business). The Borrower may update Schedule 5.23(b) to add additional

Contractual Obligations, so long as such amendment occurs by written notice to the Administrative Agent, subject to the Borrower's obligations and restrictions under this Agreement.

(c) Schedule 5.23(c) sets forth a true, correct and complete listing, including the owner and registration or application number, of all the Specified Product IP and ALN-AGT IP Collateral that are U.S. (federal or state) and foreign (i) Patents, (ii) registered trademarks and trademark applications and (iii) registered copyrights and copyright applications. As used herein, the term "registrations" refers to issued Patents under subsection (i), registered trademarks under subsection (ii), and registered copyrights under subsection (iii). Except as identified in Schedule 5.23(c), (A) with respect to the Specified Product IP and ALN-AGT IP Collateral owned by a Loan Party or a Restricted Subsidiary, the owner listed on Schedule 5.23(c) is the exclusive owner of such registration or application; (B) to the Borrower's knowledge, the registrations of the Specified Product IP and ALN-AGT IP Collateral owned by a Loan Party or a Restricted Subsidiary are valid, subsisting and enforceable; (C) (x) with respect to the Specified Product IP and ALN-AGT IP Collateral owned by a Loan Party, none of those registrations or applications have lapsed or been abandoned, cancelled or expired and (y) with respect to all other Specified Product IP and ALN-AGT IP Collateral, to the Borrower's knowledge, none of those registrations or applications have lapsed or been abandoned, cancelled or expired; (D) solely with respect to such registrations or applications within the Specified Product IP and ALN-AGT IP Collateral owned by a Loan Party, such Loan Party has taken commercially reasonable steps to maintain such registrations or applications, including by paying filing fees and submitting responses prior to final deadlines; and (E) solely with respect to such registrations or applications within the Specified Product IP and ALN-AGT IP Collateral owned by a Loan Party or a Restricted Subsidiary, each individual (including, to the Borrower's knowledge, individuals not employed by a Loan Party or any Restricted Subsidiary) associated with the filing and prosecution of such registrations or applications, including the named inventors, has complied in all material respects with all applicable duties of candor and good faith in dealing with any patent office, including the USPTO, in those jurisdictions where such duties exist. The Borrower may update Schedule 5.23(c), so long as such amendment occurs by written notice to the Administrative Agent and the Lender Representative, subject to the Borrower's obligations and restrictions under this Agreement.

(d) Except as disclosed on Schedule 5.23(d), there is no opposition, interference, reexamination, inter partes review, post-grant review, derivation or other post-grant proceeding, injunction, claim, suit, action, subpoena, hearing, inquiry, investigation (by the International Trade Commission or otherwise), complaint, arbitration, mediation, demand, decree or other dispute, proceeding or claim (collectively, "Disputes") to which a Loan Party or a Restricted Subsidiary is a party (or, to the Borrower's knowledge, to which a Loan Party or a Restricted Subsidiary is not a party) that is pending or, to Borrower's knowledge, currently threatened, that challenges the legality, scope, validity, enforceability, infringement, ownership, inventorship or other rights with respect to any of the Specified Product IP or ALN-AGT IP Collateral, except, in each case, any of the foregoing that are not material or as may arise in the ordinary, day-to-day course of prosecution of intellectual property applications and registrations. As of the Closing Date, no Loan Party or Restricted Subsidiary has received any written notice that there is any, and to the Borrower's knowledge there is no, Person who is or claims to be an inventor under any Patent included in the Specified Product IP who is not a named inventor thereof. As of the First Amendment Effective Date, no Loan Party or Restricted Subsidiary has received any written notice that there is any, and to the Borrower's knowledge there is no, Person who is or claims to be an inventor under any Patent included in the ALN-AGT IP Collateral who is not a named inventor thereof. The Borrower may update Schedule 5.23(d), so long as such amendment occurs by written notice to the Administrative Agent, subject to the Borrower's obligations and restrictions under this Agreement.

(e) Except as set forth on Schedule 5.23(e), to the knowledge of the Borrower, neither the Specified Products Business as currently conducted, nor the discovery, development, manufacture, use, import, export or commercialization of any Specified Product, or related service, process, method, substance, part or other material now used by any Loan Party or any of its Restricted Subsidiaries in the Specified Products Business or, prior to the Discharge of Co-Development Obligations, with respect to ALN-AGT infringes, misappropriates or otherwise violates any IP Rights held by any other Person, and to the best knowledge of the Borrower, there is no pending or threatened, and no event has occurred or circumstance exists that (with or without notice or lapse of time, or both) would reasonably be expected to give rise to or serve as a basis for any reasonable action, suit, or proceeding, or any investigation or claim by any Person that claims or alleges that the discovery, development, manufacture, use, import, export or commercialization of any Specified Product or ALN-AGT anywhere in the world infringes on any Patent or other IP Rights of any other Person or constitutes misappropriation of any other Person's trade secrets or other Intellectual Property rights, in each case. Except as set forth on Schedule 5.23(e), to the knowledge of the Borrower, no slogan or other advertising device, product, process, method, substance, part or other material now employed by any Loan Party or any Restricted Subsidiary in connection with the Specified Products Business infringes upon any rights held by any other Person. Except as set forth on Schedule 5.23(e) or as would not reasonably be expected to have a Material Impact, to the Borrower's knowledge, no third party is infringing, misappropriating or otherwise violating any Specified Product IP or ALN-AGT IP Collateral owned or used by any Loan Party or any of its Restricted Subsidiaries, or any of their respective licensees. The Borrower may update Schedule 5.23(e), so long as such amendment occurs by written notice to the Administrative Agent, subject to the Borrower's obligations and restrictions under this Agreement.

(f) Except as disclosed in Schedule 5.23(f), no Loan Party or any of its Restricted Subsidiaries has entered into any Contractual Obligation (other than this Agreement and the other Loan Documents) (i) creating a lien, charge, security interest or other encumbrance on, the Specified Product IP or ALN-AGT IP Collateral or any royalties on, or proceeds from, sales of any Specified Product or ALN-AGT, except for any such lien, charge, security interest or other encumbrance on the Specified Product IP or ALN-AGT IP Collateral that is immaterial to any Specified Product or ALN-AGT, as applicable, (ii) pursuant to which a Loan Party or any of its Restricted Subsidiaries has sold, transferred, assigned or pledged to any Person royalties on, or proceeds from, sales of any Specified Product or ALN-AGT or (iii) providing for milestone payments or similar development, commercialization or intellectual property-related payments by a Loan Party to any Person applicable (or that with further development and commercialization may become applicable) to any Specified Product or ALN-AGT. The Borrower may update Schedule 5.23(f), so long as such amendment occurs by written notice to the Administrative Agent, subject to the Borrower's obligations and restrictions under this Agreement.

SECTION 2. Amendments to Security Agreement. Upon satisfaction (or waiver by the Lenders) of the conditions set forth in Section 3 hereof, Section 7(e) of the Security Agreement is hereby amended by restating clauses (i) through (v) thereof in their entirety as follows

(i) For the purpose of enabling the Administrative Agent to exercise rights and remedies under this Section 7 (including in order to take possession of, collect, receive, assemble, process, appropriate, remove, realize upon, sell, assign, license out, convey, transfer or grant options to purchase any Collateral), each Grantor hereby grants to the Administrative Agent, for the benefit of Lenders and all other Secured Parties, an irrevocable (until the Facility Termination Date and subject to the license carveouts in clauses (A) and (B) below), nonexclusive, assignable license (which license may be

exercised only upon an Event of Default, without payment of royalty or other compensation to any Grantor or any Subsidiary thereof), including the right to practice, use, sublicense or otherwise exploit, solely in connection with the Specified Products (other than Inclisiran) and, prior to the Discharge of Co-Development Obligations, ALN-AGT or other items in the Collateral, any Intellectual Property now owned or hereafter acquired by such Grantor or any of its Subsidiaries or licensed or sublicensed to such Grantor or any of its Subsidiaries, in each case that is relevant to any of the Specified Products or, prior to the Discharge of Co-Development Obligations, ALN-AGT (in each case, other than any Intellectual Property that is exclusively relevant to Inclisiran), but excluding any Shared IP or any Specified Product IP licensed to such Grantor, or any ALN-AGT IP Collateral licensed to such Grantor, and wherever the same may be located, and including in such license reasonable access to all media in which any of the licensed items may be recorded or stored and to all computer software and programs used for the compilation or printout thereof to the extent that such non-exclusive license (A) does not violate the express terms of any agreement between a Grantor or any of its Subsidiaries and a third party governing such Intellectual Property existing as of the Closing Date (or, in the case of such Intellectual Property that is relevant to ALN-AGT but not relevant to any of the Specified Products, existing as of the First Amendment Effective Date) (and such non-exclusive license and access are and will be subject to and subordinate to the terms of any Permitted License, excluding any Lien incurred under any Permitted Royalty Financing, entered into by Grantor or any of its Subsidiaries after the Closing Date but prior to such Event of Default), or gives such third party any right of acceleration, modification, termination or cancellation therein and (B) is not prohibited by any Applicable Law; *provided* that such license and sublicenses with respect to Trademarks shall be subject to the maintenance of quality standards with respect to the goods and services on which such Trademarks are used sufficient to preserve the validity of such Trademarks. The exercise of such license by the Administrative Agent may be exercised solely upon and during the continuation of an Event of Default and solely for the purpose of exercising remedies in accordance with Section 8.02 of the Credit Agreement; *provided* that any license, sublicense or other transaction entered into by the Administrative Agent in accordance with the provisions of this Agreement shall be binding upon the Grantors and each of their respective Subsidiaries, notwithstanding any subsequent cure of an Event of Default.

(ii) For the purpose of enabling the Administrative Agent to exercise rights and remedies under this Section 7 (including in order to take possession of, collect, receive, assemble, process, appropriate, remove, realize upon, sell, assign, license out, convey, transfer or grant options to purchase any Collateral), subject to the rest of this Section 7(e), each Grantor hereby grants to the Administrative Agent, for the benefit of Lenders and all other Secured Parties, an irrevocable (until the Facility Termination Date and subject to the license carveouts in clauses (A) and (B) below), nonexclusive, assignable license, including the right to practice, use, sublicense or otherwise exploit, (which license may be exercised solely upon an Event of Default, without payment of royalty or other compensation to any Grantor or any Subsidiary thereof) under any of the Shared IP owned by such Grantor now or during the term of this Agreement prior to such Event of Default, to research, develop, make, have made, import, export, sell, offer for sale, and otherwise commercialize the Specified Products (other than Inclisiran) and, prior to the Discharge of Co-Development Obligations, ALN-AGT, and including in such license reasonable access to all media in which any of the licensed items may be recorded or stored and to all computer software and programs used for the compilation or printout thereof, in each case to the extent that such non-exclusive license and/or access (A) does not

violate the express terms of any agreement between a Grantor or any of its Subsidiaries and a third party with respect to such Intellectual Property existing as of the Closing Date (or, in the case of such Shared IP that is relevant to ALN-AGT but not relevant to any of the Specified Products, existing as of the First Amendment Effective Date) (and such non-exclusive license and access are and will be subject to and subordinate to the terms of any Permitted License, excluding any Lien incurred under any Permitted Royalty Financing, entered into by Grantor or any of its Subsidiaries after the Closing Date but prior to such Event of Default), or gives such third party any right of acceleration, modification, termination or cancellation therein and (B) is not prohibited by any Applicable Law; *provided* that such license and sublicenses with respect to Trademarks shall be subject to the maintenance of quality standards with respect to the goods and services on which such Trademarks are used sufficient to preserve the validity of such Trademarks. For clarity, Administrative Agent may exercise such license solely upon and during the continuation of an Event of Default and solely for the purpose of exercising remedies in accordance with Section 8.02 of the Credit Agreement; *provided* that any license, sublicense or other transaction entered into by the Administrative Agent in accordance with the provisions of this Agreement and the Credit Agreement shall be binding upon the Grantors and each of their respective Subsidiaries, notwithstanding any subsequent cure of an Event of Default.

(iii) For the purpose of enabling the Administrative Agent to exercise rights and remedies under this Section 7 (including in order to take possession of, collect, receive, assemble, process, appropriate, remove, realize upon, sell, assign, license out, convey, transfer or grant options to purchase any Collateral), subject to the rest of this Section 7(e), each Grantor hereby agrees to grant to the Administrative Agent, for the benefit of Lender and all other Secured Parties, solely upon an Event of Default but without payment of royalty or other compensation to any Grantor or any Subsidiary thereof, an irrevocable (until the Facility Termination Date and subject to the license carveouts in clauses (A) and (B) below), nonexclusive, assignable license, including the right to practice, use, sublicense or otherwise exploit, under any Specified Product IP or, prior to the Discharge of Co-Development Obligations, any ALN-AGT IP Collateral licensed or sublicensed to such Grantor now or during the term of this Agreement prior to such Event of Default, to research, develop, make, have made, import, export, sell, offer for sale, and otherwise commercialize the Specified Products (other than Inclisiran) and ALN-AGT, and including in such license reasonable access to all media in which any of the licensed items may be recorded or stored and to all computer software and programs used for the compilation or printout thereof to the extent that such non-exclusive license and/or access (A) does not violate the express terms of any agreement between a Grantor or any of its Subsidiaries and a third party with respect to such Specified Product IP existing as of the Closing Date (or, in the case of such ALN-AGT IP Collateral that is not Specified Product IP, existing as of the First Amendment Effective Date) (and such non-exclusive license and access are and will be subject to and subordinate to the terms of any Permitted License, excluding any Lien incurred under any Permitted Royalty Financing, entered into by Grantor or any of its Subsidiaries after the Closing Date but prior to such Event of Default), or gives such third party any right of acceleration, modification, termination or cancellation therein and (B) is not prohibited by any Applicable Law; *provided* that such license and sublicenses with respect to Trademarks shall be subject to the maintenance of quality standards with respect to the goods and services on which such Trademarks are used sufficient to preserve the validity of such Trademarks. For clarity, the foregoing license shall not be granted unless and until the occurrence of an Event of Default, and Administrative Agent may exercise such license solely for the purpose of exercising remedies in accordance with Section 8.02

of the Credit Agreement; *provided* that any license, sublicense or other transaction entered into by the Administrative Agent in accordance with the provisions of this Agreement and the Credit Agreement shall be binding upon the Grantors and each of their respective Subsidiaries, notwithstanding any subsequent cure of an Event of Default.

(iv) Notwithstanding anything herein to the contrary, Administrative Agent shall not, directly or indirectly (alone or with an affiliate or Third Party), have any right or license under Section 7(e)(iii) to (A) any Specified Product or ALN-AGT to (1) administer to or use in (or develop or design for use or administration in) the CNS or Eye through any route of administration (including when administered intrathecally or intraocularly) or (2) develop or commercialize as a prophylactic or therapeutic for a disease(s) of the CNS or Eye where the siRNA contained in the Specified Product or ALN-AGT is conferring any therapeutic effect through interference in the CNS or Eye, as applicable, with the function of any messenger RNA encoded by the target of such Specified Product or ALN-AGT; or (B) with respect to Administrative Agent's rights hereunder to (x) any Specified Product other than Onpattro or (y) ALN-AGT, any targeting ligand or other delivery technology other than GalNAc.

(v) Administrative Agent will, and will cause its sublicensees and/or assignees under the licenses granted in Section 7(e)(iii) to, ensure that in no event will any Specified Product or ALN-AGT be (A) administered to or used in (or developed or designed for use or administration in) the CNS or Eye through any route of administration (including when administered intrathecally or intraocularly), or (B) developed or commercialized as a prophylactic or therapeutic for a disease(s) of the CNS or Eye where the siRNA contained in such Specified Product or ALN-AGT is conferring any therapeutic effect through interference in the CNS or Eye, as applicable, with the function of any messenger RNA encoded by the target of such Specified Product or ALN-AGT.

SECTION 3. Conditions to Effectiveness of this Amendment. This Amendment shall become effective on the date (the "**First Amendment Effective Date**") on which there shall have occurred each of the conditions precedent set forth in this Section 3.

(a) **Amendment Documents.** The Administrative Agent and the Lenders shall have received a counterpart of this Amendment, duly executed by a Responsible Officer of each Loan Party and a duly authorized officer of each Lender.

(b) **Personal Property Collateral.** The Administrative Agent and the Lenders shall have received:

(1) searches of ownership of Intellectual Property in the appropriate governmental offices and such patent/trademark/copyright filings, in each case, as requested by the Lender Representative prior to the First Amendment Effective Date in order to perfect the Administrative Agent's security interest in the Intellectual Property; and

(2) forms of UCC financing statements for each appropriate jurisdiction as requested by the Lender Representative prior to the First Amendment Effective Date in order to perfect the Administrative Agent's security interest in the Collateral.

SECTION 4. Representations and Warranties. On and as of the First Amendment Effective Date, each Loan Party represents and warrants to the Administrative Agent and each of the Lenders:

(a) **Authorization; No Contravention.** The execution, delivery and performance by each Loan Party of the Amendment have been duly authorized by all necessary corporate or other organizational action, and do not and will not (i) contravene the terms of any of such Person's Organization Documents; (ii) conflict with or result in any breach or contravention of, or the creation of (or the requirement to create) any Lien under, or require any payment to be made under (x) any Contractual Obligation to which such Person is a party or affecting such Person or the properties of such Person or any of its Restricted Subsidiaries or (y) any order, injunction, writ or decree of any Governmental Authority or any arbitral award to which such Person or its property is subject; or (iii) violate any Applicable Law, except in the case of this Section 4(a)(ii), with respect to any conflict, breach, violation, or payment, to the extent that such conflict, breach, violation, or payment would not reasonably be expected to have a Material Adverse Effect.

(b) **Governmental Authorization; Other Consents.** No approval, consent, exemption, authorization, or other action by, or notice to, or filing with, any Governmental Authority or any other Person is necessary or required in connection with (a) the execution, delivery or performance by, or enforcement against, any Loan Party of this Amendment, (b) the grant by any Loan Party of the Liens granted by it pursuant to the Collateral Documents, (c) the perfection or maintenance of the Liens created under the Collateral Documents (including the first priority nature thereof) or (d) the exercise by the Administrative Agent or any Lender of its rights under this Amendment or the other Loan Documents or the remedies in respect of the Collateral pursuant to the Collateral Documents, other than (i) authorizations, approvals, actions, notices and filings which have been duly obtained, (ii) filings to perfect the Liens created by the Collateral Documents and (iii) those approvals, consents, exemptions, authorizations or other actions, notices or filings, the failure of which to obtain or make could not reasonably be expected to have a Material Adverse Effect.

(c) **Binding Effect.** This Amendment has been duly executed and delivered by each Loan Party that is party thereto. This Amendment constitutes a legal, valid and binding obligation of such Loan Party, enforceable against each Loan Party that is party hereto in accordance with its terms, subject to applicable bankruptcy, insolvency, reorganization, moratorium or other laws affecting creditors' rights generally and subject to general principals of equity.

(d) **Credit Agreement Representations.** Immediately before and immediately after giving effect to this Amendment, the representations and warranties of the Borrower and each other Loan Party contained in any Loan Document, are (i) with respect to representations and warranties that contain a materiality qualification, true and correct on and as of the First Amendment Effective Date and (ii) with respect to representations and warranties that do not contain a materiality qualification, true and correct in all material respects on and as of the First Amendment Effective Date Borrowing, and except that for purposes of this Section 4(d), the representations and warranties contained in Sections 5.05(a) of the Amended Credit Agreement shall be deemed to refer to the most recent statements furnished pursuant to Sections 6.01(a) of the Amended Credit Agreement.

SECTION 5. Ratification of Liability. As of the First Amendment Effective Date, the Borrower and the other Loan Parties, as debtors, grantors, pledgors, guarantors, assignors, or in other similar capacities in which such parties grant liens or security interests in their properties or otherwise act as accommodation parties or guarantors, as the case may be, under the Loan Documents to which they are a party, hereby ratify and reaffirm all of their payment and performance obligations and obligations to indemnify, contingent or otherwise, under each of such Loan Documents to which they are a party, and

ratify and reaffirm their grants of liens on or security interests in their properties pursuant to such Loan Documents to which they are a party, respectively, as security for the Obligations, and as of the First Amendment Effective Date, each such Person hereby confirms and agrees that such liens and security interests hereafter secure all of the Obligations, including, without limitation, all additional Obligations hereafter arising or incurred pursuant to or in connection with the Amendment, the Amended Credit Agreement or any other Loan Document. As of the First Amendment Effective Date, the Borrower and the other Loan Parties further agree and reaffirm that the Loan Documents to which they are parties now apply to all Obligations as defined in the Amended Credit Agreement (including, without limitation, all additional Obligations hereafter arising or incurred pursuant to or in connection with this Amendment, the Amended Credit Agreement or any other Loan Document). As of the First Amendment Effective Date, the Borrower and the other Loan Parties (a) further acknowledge receipt of a copy of the Amendment, (b) consent to the terms and conditions of same, and (c) agree and acknowledge that each of the Loan Documents to which they are a party remain in full force and effect and is hereby ratified and confirmed.

SECTION 6. Reference to and Effect upon the Credit Agreement.

(a) Except as specifically amended hereby, all terms, conditions, covenants, representations and warranties contained in the Amended Credit Agreement and other Loan Documents, and all rights of the Secured Parties and all of the Obligations, shall remain in full force and effect. As of the First Amendment Effective Date, the Borrower and the other Loan Parties hereby confirm that the Amended Credit Agreement and the other Loan Documents are in full force and effect and that neither the Borrower nor any other Loan Party has any right of setoff, recoupment or other offset or any defense, claim or counterclaim with respect to any of the Obligations, the Amended Credit Agreement or any other Loan Document.

(b) Except as specifically set forth herein, the execution, delivery and effectiveness of this Amendment shall not directly or indirectly (i) constitute a consent or waiver of any past, present or future violations of any provisions of the Amended Credit Agreement or any other Loan Documents nor constitute a novation of any of the Obligations under the Amended Credit Agreement or other Loan Documents or (ii) constitute a course of dealing or other basis for altering any Obligations or any other contract or instrument.

(c) From and after the First Amendment Effective Date, (i) the term “Agreement” in the Amended Credit Agreement, and all references to the Credit Agreement in any other Loan Document, shall mean the Credit Agreement, as amended by, among other things, this Amendment, and (ii) the term “Loan Documents” in the Amended Credit Agreement and the other Loan Documents shall include, without limitation, the Amendment and any agreements, instruments and other documents executed and/or delivered in connection herewith.

(d) This Amendment shall not be deemed or construed to be a satisfaction, reinstatement, novation or release of the Credit Agreement or any other Loan Document.

SECTION 7. Governing Law; Jurisdiction; Consent to Service of Process. THIS AMENDMENT AND ANY CLAIMS, CONTROVERSY, DISPUTE OR CAUSE OF ACTION (WHETHER IN CONTRACT OR TORT OR OTHERWISE) BASED UPON, ARISING OUT OF OR RELATING TO THIS AMENDMENT AND THE TRANSACTIONS CONTEMPLATED HEREBY SHALL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH THE LAW OF THE STATE OF NEW YORK. THE PROVISIONS OF SECTION 11.14(B), (C) AND (D) OF THE AMENDED CREDIT AGREEMENT ARE INCORPORATED HEREIN BY REFERENCE, *MUTATIS MUTANDIS*, AS IF FULLY SET FORTH HEREIN.

SECTION 8. Counterparts; Integration. This Amendment may be executed in counterparts (and by different parties hereto in different counterparts), each of which shall constitute an original, but all of which when taken together shall constitute a single contract. This Amendment and any separate letter agreements with respect to fees payable to the Administrative Agent, the Lender Representative or the Lenders listed on the signature pages hereto, constitute the entire contract among the parties relating to the subject matter hereof and supersede any and all previous agreements and understandings, oral or written, relating to the subject matter hereof. Delivery of an executed counterpart of a signature page of this Amendment by telecopier or in electronic (i.e., “pdf” or “tif”) format shall be effective as delivery of a manually executed counterpart of this Amendment.

SECTION 9. Severability. Any provision of this Amendment held to be invalid, illegal or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such invalidity, illegality or unenforceability without affecting the validity, legality and enforceability of the remaining provisions hereof; and the invalidity of a particular provision in a particular jurisdiction shall not invalidate such provision in any other jurisdiction.

SECTION 10. Headings. Article and Section headings used herein are for convenience of reference only, are not part of this Amendment and shall not affect the construction of, or be taken into consideration in interpreting, this Amendment.

SECTION 11. Notices. All notices, requests, and demands to or upon the respective parties hereto shall be given in accordance with the Amended Credit Agreement.

SECTION 12. Waiver of Jury Trial. EACH PARTY HERETO HEREBY IRREVOCABLY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY IN ANY LEGAL PROCEEDING DIRECTLY OR INDIRECTLY ARISING OUT OF OR RELATING TO THIS AMENDMENT OR THE TRANSACTIONS CONTEMPLATED HEREBY (WHETHER BASED ON CONTRACT, TORT OR ANY OTHER THEORY). EACH PARTY HERETO (A) CERTIFIES THAT NO REPRESENTATIVE, AGENT OR ATTORNEY OF ANY OTHER PERSON HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PERSON WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE THE FOREGOING WAIVER AND (B) ACKNOWLEDGES THAT IT AND THE OTHER PARTIES HERETO HAVE BEEN INDUCED TO ENTER INTO THIS AGREEMENT AND THE OTHER LOAN DOCUMENTS BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS AND CERTIFICATIONS IN THIS SECTION 12.

SECTION 13. Agent Authorization. Each of the undersigned Lenders, which constitute all of the Lenders party to the Credit Agreement, hereby (i) authorize and instruct the Administrative Agent to execute and deliver this Amendment, the Blackstone Intercreditor Agreement and the other documents entered into in connection herewith and therewith, (ii) acknowledge and agree that the instruction set forth in this Section 13 constitutes an instruction from the Lenders under the Loan Documents, including Section 8.03 of the Credit Agreement, and (iii) agrees to be bound by the terms and conditions of this Amendment and such other documents.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties hereto have caused this Amendment to be duly executed by their respective authorized officers as of the day and year first above written.

ALNYLAM PHARMACEUTICALS, INC.,
as Borrower

By: /s/ John Maraganore
Name: John Maraganore, Ph.D.
Title: Chief Executive Officer
SIRNA THERAPEUTICS, INC., as a Guarantor

By: /s/ Mary Beth Delena
Name: Mary Beth Delena
Title: Secretary
ALNYLAM U.S., INC., as a Guarantor

By: /s/ Mary Beth Delena
Name: Mary Beth Delena
Title: Secretary

[Signature Page to First Amendment to Credit Agreement]

WILMINGTON TRUST, NATIONAL ASSOCIATION, as Administrative Agent

By: /s/ Amanda Berg __
Name: Amanda Berg
Title: Banking Officer

[Signature Page to First Amendment to Credit Agreement]

GSO COF III AIV-1 LP, as a Lender

By: GSO Capital Opportunities Associates III LLC, its general partner

By: /s/ Marisa Beeney

Name: Marisa Beeney

Title: Authorized Signatory

GSO CSF III AIV-1 LP, as a Lender

By: GSO Capital Solutions Associates III LP, its general partner

By: GSO Capital Solutions Associates III (Delaware) LLC, its general partner

By: /s/ Marisa Beeney

Name: Marisa Beeney

Title: Authorized Signatory

BSOF BODYGUARD HOLDINGS L.P., as a Lender

By: Blackstone Alternative Solutions L.L.C., as investment manager

By: /s/ Peter Koffler

Name: Peter Koffler

Title: Authorized Person

BLACKSTONE HOLDINGS FINANCE CO. L.L.C., as a Lender

By: Blackstone Holdings I L.P., as sole member

By: Blackstone Holdings I/II GP, Inc., as General Partner

By: /s/ Christopher Striano

Name: Christopher Striano

Title: Authorized Signatory

[Signature Page to First Amendment to Credit Agreement]

FIRST AMENDMENT TO LEASE

This FIRST AMENDMENT TO LEASE (this “**First Amendment**”) is made as of the 30th day of September, 2020 (the “**Effective Date**”) by and between **RREEF AMERICA REIT II CORP. PPP**, a Maryland corporation (“**Landlord**”), and **ALNYLAM PHARMACEUTICALS, INC.**, a Delaware corporation (“**Tenant**”).

RECITALS

A. Landlord and Tenant entered into that certain Lease dated April 15, 2015, (the “**Lease**”), under which Landlord leases to Tenant certain premises consisting of 13,937 rentable square feet on the twelfth (12th) floor (the “**12th Floor Premises**”), 23,350 rentable square feet on the thirteenth (13th) floor (the “**13th Floor Premises**”) and 11,312 rentable square feet on the sixteenth (16th) floor (the “**16th Floor Premises**”) and together with the 12th Floor Premises and the 13th Floor Premises, the “**Premises**”) in the building in Riverfront Office Park at 101 Main Street, Cambridge, Massachusetts (the “**101 Main Building**”) for a Term that currently expires on June 30, 2021 (the “**Original Expiration Date**”); and

B. Landlord and Tenant wish to amend the Lease to: (i) amend the Term of the Lease for the 12th Floor Premise and the 13th Floor Premises; (ii) terminate the Term of the Lease as to the 16th Floor Premises only; and (iii) amend certain other terms of the Lease, subject to and upon the terms and conditions set forth in this First Amendment.

AGREEMENTS

NOW, THEREFORE, in consideration of the mutual agreements herein contained and for other valuable consideration, the receipt and sufficiency of which is acknowledged, Landlord and Tenant agree as follows:

1. Recitals; Capitalized Terms. All of the foregoing recitals are true and correct. Unless otherwise defined herein, all capitalized terms used in this First Amendment shall have the meanings ascribed to them in the Lease, and all references herein or in the Lease to the “Lease” or “this Lease” or “herein” or “hereunder” or similar terms or to any section thereof shall mean the Lease, or such section thereof, as amended by this First Amendment.

2. Extension of the Term for 12th Floor Premises and the 13th Floor Premises.

(a) The Term of the Lease with respect to the 12th Floor Premises and the 13th Floor Premises (collectively, the “**Renewal Premises**”) is hereby extended (the “**First Extended Term**”) from July 1, 2021 through and including June 30, 2026 (the “**New Termination Date**”). Except as otherwise set forth in this First Amendment, the First Extended Term shall be upon all of the terms and conditions of the Lease. From and after the Effective Date, the phrase or phrases “Term of this Lease” or “Term of Lease” or “the initial term” or “original term” as used in the Lease shall be deemed to refer to the Term of the Lease as herein amended and extended for the First Extended Term and all references to the “Termination Date” in the Lease shall be deemed, to mean and refer to the New Termination Date set forth in this Section 2. Landlord acknowledges and agrees that Tenant will continue to have the right, pursuant to Section 42 of the

Lease, to extend the Term of the Lease for a period of five (5) years after the New Termination Date.

(b) Tenant is in possession of the Renewal Premises, and hereby accepts the Renewal Premises for the First Extended Term in its AS IS condition, WITHOUT REPRESENTATION OR WARRANTY by Landlord, and Tenant acknowledges that Landlord shall have no obligation to perform any construction or make any additional improvements or alterations, or, except for the payment of the Refurbishment Allowance (as hereinafter defined), to pay or afford any allowance to Tenant (including any the TI Allowance specified in the Lease) for improvements or alterations to prepare or improve the same for Tenant's use during the Extended Term.

3. Annual Rent and Monthly Installment of Rent.

(a) Annual Rent for Renewal Premises. From and after the Effective Date of this First Amendment and continuing for the balance of the Term of the Lease (as extended herein for the First Extended Term), Tenant shall pay Annual Rent and Monthly Installments of Basic Rent with respect to the Renewal Premises to Landlord in the manner and in accordance with the terms and conditions of the Lease, in the amounts set forth below:

PERIOD	ANNUAL FIXED RENT PER SQUARE FOOT	ANNUAL RENT	MONTHLY INSTALLMENT OF RENT
Effective Date – April 30, 2021	\$77.00	\$2,871,099.00	\$239,258.25
May 1, 2021 – June 30, 2021	\$78.00	\$2,908,386.00	\$242,365.50
July 1, 2021 – June 30, 2022	\$95.00	\$3,542,265.00	\$295,188.75
July 1, 2022 – June 30, 2023	\$96.90	\$3,613,110.30	\$301,092.53
July 1, 2023 – June 30, 2024	\$98.84	\$3,685,447.08	\$307,120.59
July 1, 2024 – June 30, 2025	\$100.82	\$3,759,275.34	\$313,272.95
July 1, 2025 – June 30, 2026	\$102.84	\$3,834,595.08	\$319,549.59

(b) Annual Rent for 16th Floor Premises. Beginning on the Effective Date and continuing through the Original Expiration Date, Tenant shall pay Basic Rent and Monthly Installments of Basic Rent with respect to the 16th Floor Premises to Landlord in the manner and in accordance with the terms and conditions of the Lease, in the amounts set forth below:

PERIOD	ANNUAL FIXED RENT PER SQUARE FOOT	MONTHLY INSTALLMENT OF RENT
Effective Date – April 30, 2021	\$77.00	\$72,585.33
May 1, 2021 – Original Expiration Date	\$78.00	73,528.00

(c) Rent Adjustments. From and after the Effective Date and thereafter during the Term of the Lease (as extended herein for the First Extended Term), Tenant shall continue to pay Tenant's Proportionate Share of all Expenses, Insurance Costs and Taxes as and when due pursuant to the terms of Section 4 of the Lease, except that:

(i) Tenant's Proportionate Share shall be reduced to 10.95% (37,287/340,673) commencing on the day immediately following the 16th Floor Termination Date (as hereinafter defined);

(ii) during the First Extended Term, the Base Year (Expenses) and the Base Year (Insurance) shall be calendar year 2021, and the Base Year (Taxes) shall be Taxes for tax fiscal 2022 (i.e., July 1, 2021 through June 30, 2022).

(d) Allocable Costs - Electricity. Tenant shall continue to pay Tenant's Allocable Electricity Costs for the Premises in accordance with the terms of Section 13.1.1 of the Lease.

4. Security Deposit. The Security Deposit required under the Lease is currently in the form of a letter of credit in the amount of \$1,182,575.68. Provided Tenant is not in default under the Lease at any time prior to or as of the 16th Floor Termination Date and Tenant timely vacates and surrenders possession of the 16th Floor Premises in the condition required under the Lease, as amended in this First Amendment, then the amount of the Security Deposit required under the Lease may be reduced to \$907,317.00 (the "**New Security Deposit Amount**") to reflect the termination of the Lease as to the 16th Floor Premises. If the foregoing conditions have been satisfied, then, following the 16th Floor Termination Date, Tenant may deliver to Landlord a new letter of credit or an amendment to the existing letter of credit, in form required under the Lease and reasonably approved by Landlord, which decreases the face amount of the letter of credit to the New Security Deposit Amount.

5. Parking: From and after the 16th Floor Expiration Date and continuing through the Term, the number of parking passes Tenant will be entitled to use under the Lease shall be reduced to thirty (30) parking passes and the prevailing monthly parking charge is currently \$350 per parking pass per month (see Article 39), which prevailing monthly parking charge is subject to increase from time to time as set forth in the Lease. In addition, Landlord shall provide Tenant with an additional eight (8) parking passes on a "tenant-at-will" basis at the same prevailing parking charge, provided Landlord shall have the right to take back such tenant-at-will spaces upon six (6) months' prior written notice to Tenant in the event that a portion of the garage is

redeveloped into office space. In no event shall such tenant-at-will spaces be allocated to another tenant in the Building.

6. Refurbishment Allowance. Landlord shall disburse to Tenant a refurbishment allowance in the total amount of \$559,305.00 (the “**Refurbishment Allowance**”) toward the costs and expenses incurred in connection with the performance of the leasehold improvements to the Renewal Premises. Tenant may apply the Refurbishment Allowance for the payment of construction and other costs in accordance with the terms of this Section 6. Upon submission by Tenant to Landlord of (a) a statement (a “**TI Fund Request**”) setting forth the total amount of the Refurbishment Allowance requested, (b) a summary of the Tenant’s leasehold improvements to the Renewal Premises performed using AIA standard form Application for Payment (G 702) executed by the general contractor and by the architect, (c) invoices from the general contractor, the architect, and any subcontractors, material suppliers and other parties requesting payment with respect to the amount of the Refurbishment Allowance then being requested, (d) lien releases from the general contractor and each subcontractor and material supplier with respect to the completed leasehold improvements performed that correspond to the TI Fund Request each in a form reasonably acceptable to Landlord and complying with applicable laws, then Landlord shall, within thirty (30) days following receipt by Landlord of a TI Fund Request and the accompanying materials required by this Section 6, pay to Tenant the amount of the Refurbishment Allowance requested in such TI Fund Request. In no event shall Landlord have any obligation to pay for any costs for leasehold improvements to the Premises in excess of the Refurbishment Allowance. Notwithstanding anything in this Section 6 or the Lease to the contrary, Tenant may requisition all or any portion of the Refurbishment Allowance for reimbursement of Tenant’s costs to purchase and install furniture, fixtures and equipment for the Renewal Premises (“**FF&E costs**”) and/or as a credit against the Annual Rent payable during the First Extended Term (which rent credit, if any, shall apply to the next monthly installment(s) of Annual Rent immediately following Tenant’s notice to Landlord of its election to utilize the rent credit). Any remaining amount of the Refurbishment Allowance that is not applied by Tenant toward the costs of leasehold improvements to the Renewal Premises, FF&E costs and/or as an Annual Rent credit by the June 30, 2023 shall be deemed forfeited by Tenant and will no longer be payable by Landlord.

7. Termination of the 16th Floor Premises.

(a) The Term of the Lease shall expire and be terminated and of no further force or effect solely as to the 16th Floor Premises at 11:59 P.M. on the Original Expiration Date. Tenant will surrender the 16th Floor Premises to Landlord on or before the Original Expiration Date (together with all keys and access cards to the 16th Floor Premises) vacant, broom clean, free from all occupants, subtenants, or other persons or entities claiming rights of possession by, through or under Tenant. Tenant shall not have any removal or restoration obligations with respect to the 16th Floor Premises other than to (i) remove (A) the items listed on Schedule A, and (B) personal property belonging to any employees or other occupants; and (ii) decommission certain items as described on Schedule A.

(b) Any holding over by Tenant in the 16th Floor Premises after the Original Expiration Date is subject to the provisions of the Lease regarding holding over by Tenant after

expiration of the term of the Lease. The “**16th Floor Surrender Date**” shall be the date that Tenant actually vacates and delivers possession of the 16th Floor Premises to Landlord in the condition required under the Lease and this First Amendment. No act or thing done by Landlord prior to the satisfaction of all conditions precedent to the occurrence of the Original Expiration Date shall be deemed an acceptance of a surrender of the 16th Floor Premises, and the delivery of keys to any employee of Landlord or of Landlord’s agents shall not operate as a termination of the Lease or a surrender of the 16th Floor Premises. Notwithstanding anything herein to the contrary, Tenant shall be obligated to perform all of Tenant’s obligations under the Lease with respect to the 16th Floor Premises which arise under the Lease up to and including the Original Expiration Date, including, without limitation, the payment of Annual Rent, Monthly Installments of Rent and Additional Rent and other monetary sums and any year-end reconciliations of Expenses, Taxes and Insurance Costs attributable to the 16th Floor Premises.

(c) Commencing immediately following the Original Expiration Date, the term “Premises” shall mean and refer solely to the Renewal Premises and be deemed to contain 37,287 rentable square feet.

8. Brokerage. Landlord and Tenant each represent and warrant to the other that neither of them has employed or dealt with any broker, agent or finder in carrying on the negotiations relating to this First Amendment except for CBRE (the “**Broker**”), which Broker shall be compensated by Landlord per separate agreement. Tenant shall indemnify and hold Landlord harmless from and against any claim or claims for brokerage or other commissions relating to this First Amendment asserted by any broker, agent or finder engaged by Tenant or with whom Tenant has dealt other than Broker. Landlord shall indemnify and hold Tenant harmless from and against any claim or claims for brokerage or other commissions relating to this First Amendment asserted by any broker, agent or finder engaged by Landlord or with whom Landlord has dealt.

9. Ratification. Except as expressly modified by this First Amendment, the Lease shall remain in full force and effect, and as further modified by this First Amendment, is expressly ratified and confirmed by the parties hereto. This First Amendment shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns, subject to the provisions of the Lease regarding assignment and subletting.

10. Counterparts and Authority. This First Amendment may be executed in multiple counterparts, each of which shall be deemed an original and all of which together shall constitute one and the same document. Tenant hereby represents and warrants to Landlord that (i) Tenant has full power and authority to carry on its business, enter into this First Amendment and consummate the transaction contemplated by this First Amendment, (ii) the individual executing and delivering this First Amendment on Tenant’s behalf has been duly authorized to do so, (iii) the Lease and this First Amendment constitutes a valid, legal, binding and enforceable obligation of Tenant (subject to bankruptcy, insolvency or creditor rights laws generally, and principles of equity generally), and (iv) all consents, approvals, authorizations, orders or filings of or with any court or governmental agency or body, if any, required on the part of Tenant for the execution, delivery and performance of this First Amendment have been obtained or made.

[Signatures Commence on Following Page]

IN WITNESS WHEREOF, Landlord and Tenant have caused this First Amendment to be duly executed by persons hereunto duly authorized, in multiple copies, each to be considered an original hereof, as of the date first set forth above.

LANDLORD:

RREEF AMERICA REIT II CORP. PPP,
a Maryland corporation

By: /s/ David F. Crane

Name: David F. Crane
Title: Vice President

By: /s/ Gerald F. Ianetta

Name: Gerald F. Ianetta
Title: Vice President

TENANT:

ALNYLAM PHARMACEUTICALS, INC., a Delaware corporation

By: /s/ Jeff Poulton

Name: Jeff Poulton
Title: Chief Financial Officer

SCHEDULE A

Items to be Removed from the 16th Floor Premises by Alnylam

- Reconfiguration and password removal networking / WAPs equipment
- Leased printer/copiers
- Alnylam acrylic signage
- Coffee Machine cup
- Coffee Brewer
- ION Water Cooler
- Cintas first aid cabinet
- AED cabinet
- Data destruction bin
- Ricoh printer

Items to be Decommissioned by Alnylam but Remain on the 16th Floor Premises

- iStar Software House Panel – CCURE 9000 Software
 - (6) HID RP40 card reader
 - (1) Winland Enivor Water/Temp
- ExacqVision Video Software
 - (2) Axis 3014 cameras



August 26, 2020

Barry E. Greene
[**] Street
[**]

Dear Barry:

In connection with your resignation from your position as President of Alnylam Pharmaceuticals, Inc. (the “Company”) as of September 30, 2020, the consulting obligations you have agreed to undertake, and the extension of your non-compete and non-solicitation obligations through September 30, 2022, this letter agreement summarizes the terms to which you and Alnylam have agreed. If you agree with the terms described below in this letter agreement, which include a general release (the “Letter Agreement”), please sign in the space provided below and return it to me. Please note that, in order to be effective, it is necessary for you to sign and return this Letter Agreement on September 30, 2020. It cannot be signed prior to or after that date.

1. As we have discussed, your resignation will become effective and your employment with the Company will terminate as of September 30, 2020 (the “Separation Date”), and you agree to perform your job duties and otherwise comply with Company rules, policies and procedures through the Separation Date. In this regard, you will take all actions necessary for the finalization of the Company’s financial statements for the three- and six-month periods ending June 30, 2020, in accordance with generally accepted accounting principles, the Quarterly Report on Form 10-Q to be filed with the Securities and Exchange Commission and the related quarterly Earnings Release, as well as complete any other identified transitional matters required through the Separation Date. You will be paid, at your current rate of pay, for time worked through the Separation Date and for any unused and accrued vacation time (if any) as of the Separation Date, less lawful deductions, and for any unreimbursed expenses submitted and documented to the extent such expenses are reimbursable under the Company’s Travel & Entertainment Expense policy and/or other applicable policy.

2. After the Separation Date, except as provided below, you will no longer be entitled to receive any benefits paid by or participate in any benefit programs offered by the Company to its employees. Your coverage under the Company’s health plans will continue through September 30, 2020. You will receive, under separate cover, information concerning your right to continue your health insurance benefits after that date in accordance with COBRA.

3. In consideration for signing this Letter Agreement and the performance of your obligations hereunder, including the provision of consulting services and your non-compete and non-solicitation obligations described in Paragraph No. 9 below, provided you sign this Letter Agreement and return it to me on the Separation Date and do not revoke your acceptance pursuant to Paragraph No. 11 below, the Company agrees as follows:

675 West Kendall Street – Henri A. Termeer Square — Cambridge MA, 02142 main 617.551.8200 — fax 617.551.8101 —
www.alnylam.com

- a. The Company will pay you twelve (12) months of salary continuation at your current base rate of pay of \$627,300 per year, less lawful deductions, which shall be reported by the Company as W-2 wages. Payments will be made on a bi-weekly basis consistent with the Company's normal payroll practices and commencing with the first payroll cycle after the expiration of the revocation period set forth in Paragraph No. 11, retroactive to the Separation Date, and, to the extent required, otherwise compliant with Section 409A. Any payment scheduled to be made following March 15, 2021 and prior to the date that is six months and one day following the Separation Date (the "Delayed Payment Date") shall not be paid until the Delayed Payment Date.
- b. Notwithstanding your resignation prior to the conclusion of fiscal year 2020, you will receive a cash bonus payment for 2020 (a "Bonus") under the Company's Annual Incentive Program (the "Bonus Plan") equal to your Target Award percentage of 60%, or \$376,380, regardless of whether the Company's Compensation Committee approves a Bonus Pool (as defined in the Bonus Plan) for 2020 and without giving effect to any corporate performance multiplier that may be approved by the Company's Board of Directors for 2020. Such Bonus, less lawful deductions, will be paid in the first regular payroll cycle of 2021, which will be prior to March 15, 2021.
- c. Provided that you are eligible for and properly elect to continue your health coverage under COBRA, the Company will provide a lump sum payment within ten (10) business days of the Separation Date, equal to the amount that the Company would have contributed toward the cost of your COBRA premium for the period from October 1, 2020 through March 31, 2022 as if you were actively employed and the Company was contributing to your health coverage premium. You acknowledge that if you properly elect COBRA, you will be required to pay the full amount of any COBRA premium directly to the Company's COBRA administrator (currently Discovery Benefits).
- d. Following the Separation Date through September 30, 2022 (the "Consulting Period"), you agree to provide consulting services to the Company for up to ten (10) hours per month, as requested by the Company, with reasonable advance notice. In consideration of such consulting commitment and other valuable consideration, in addition to the benefits described in subparagraphs 3(a) through 3(c) above, all equity awards previously granted to you that are vested as of the Separation Date shall remain exercisable pursuant to the terms of the respective Company stock incentive plan and award agreement. For the avoidance of doubt, you will not be entitled to receive any additional equity awards after the Separation Date and all outstanding equity awards will stop vesting as of the last day of the Consulting Period, or upon the date of any earlier material breach by you of your consulting obligations or any other obligations hereunder or under your Employee Nondisclosure, Noncompetition and Assignment of Intellectual Property Agreement, attached to this Letter Agreement as **Exhibit A** (the "NDA"), as revised in Paragraph No. 9 below. The Company shall reimburse you for all reasonable out of pocket expenses incurred in the provision of the consulting services that are submitted and documented, to the extent such expenses are reimbursable under the Company's Travel & Entertainment Expense policy and/or other applicable policy. You acknowledge and agree that (1) effective upon the Separation Date, you will no longer be designated as an employee, nor will you be designated as a contractor or consultant, that is subject to the Company's Amended and Restated Insider Trading Policy (the "ITP"), (2) from and after the Separation Date and pursuant to the provisions of the ITP, you will remain subject to the restrictions set forth in the ITP until any material nonpublic information possessed by you has become public or is no longer material, and (3) you understand and will comply with the restrictions under applicable securities laws

regarding (a) transacting in Company securities on the basis of material nonpublic information concerning the Company and (b) disclosing material nonpublic information to others who might transact in Company securities on the basis of that information.

- e. The Company agrees to instruct the current members of its Management Board and its Board of Directors not to make or publish any written or oral disparaging or defamatory statements about you to any outside third party.

4. You understand and agree that you would not receive the monies and/or benefits specified in Paragraph No. 3 above, except for your execution of this Letter Agreement and the fulfillment of the promises contained in this Letter Agreement. You also agree that, if you materially breach your consulting obligations or any other obligations contained in this Letter Agreement or under the terms of the NDA, as revised in Paragraph No. 9 below, the Company shall have the right, in addition to any other damages, to seek the return of the consideration provided in Paragraph Nos. 3(a) through 3(c) above, and, as set forth in Paragraph No. 3(d) above, to stop the vesting of all outstanding unvested equity awards (without impacting the validity or enforceability of the general release contained herein). Notwithstanding the foregoing, no breach will be treated as a material breach under this Letter Agreement unless the Company has: (y) provided you written notice stating with reasonable specificity the applicable facts and circumstances underlying such finding of breach; and (z) provided you with an opportunity to cure to the extent curable any such breach within thirty (30) days after the receipt of the written notice.

5. The Indemnification Agreement between you and the Company dated September 16, 2016 shall remain in full force and effect.

6. As of the Separation Date, you will resign from your position as President of the Company and from your position(s) as an officer or director of any direct or indirect subsidiary of the Company and you further agree to sign any specific resignation letters for any or all affiliates as may be requested by the Chief Legal Officer or Deputy General Counsel of the Company.

7. In consideration of the payments to be made by the Company to you as set forth in Paragraph No. 3 above and the promises contained in this Letter Agreement, you voluntarily and of your own free will hereby release, forever discharge and hold harmless Alnylam Pharmaceuticals, Inc., its subsidiaries, divisions and affiliates, its present or former officers, directors, trustees, employees, agents, insurers, or successors or assigns from any and all claims, demands, rules or regulations, or any other causes of action of whatever nature, whether known or unknown, that have arisen through the date you execute this Letter Agreement, including, but not limited to, the National Labor Relations Act, as amended; Title VII of the Civil Rights Act of 1964, as amended; Sections 1981 through 1988 of Title 42 of the United States Code, as amended; the Age Discrimination in Employment Act of 1967, as amended; the Older Workers Benefit Protection Act; the Immigration Reform Control Act, as amended; the Employee Retirement Income Security Act of 1974, 29 U.S.C. § 1001, et seq.; the Occupational Safety and Health Act, as amended; the Civil Rights Act of 1866, 29 U.S.C. § 1981, et seq.; the Rehabilitation Act of 1973, 29 U.S.C. § 701, et seq.; the Americans With Disabilities Act of 1990, as amended; the Civil Rights Act of 1991; the Family and Medical Leave Act; the Equal Pay Act; the Massachusetts Law Against Discrimination, G.L. c. 151B; the Massachusetts Wage Payment Statute, G.L. c. 149, §§ 148, 148A, 148B, 149, 150, 150A-150C, 151, 152, 152A, et seq.; the Massachusetts Wage and Hour Laws, G.L. c. 151 § 1A et seq.; the Massachusetts Privacy Statute, G.L. c. 214, § 1B; the Massachusetts Wage Payment Statute, G.L. c. 149, § 148 et seq.; the Massachusetts Sexual Harassment Statute, G.L. c. 214 § 1C; the Massachusetts Civil Rights Act, G.L. c. 12, § 11H, the Massachusetts Equal Rights Act, G.L. c. 93, § 102; the Massachusetts Equal Pay Act, G.L. c. 149, § 105A; the Massachusetts Parental Leave Law, G.L. c. 149, § 105D; the Massachusetts Family and Medical Leave Law, G.L. c. 175M; or any other federal or state law, regulation, or ordinance; any public policy, contract, tort, or common law; or any allegation for costs, fees, or other expenses including attorneys' fees incurred in these matters. In addition, if any claim is not subject to release, to the extent permitted by law, you waive any right or ability to be a class or collective action representative or to otherwise participate in any putative or

certified class, collective or multi-party action or proceeding based on such a claim in which the Company or any other releasee identified in this Letter Agreement is a party.

Notwithstanding the foregoing, you are not waiving any rights you may have to (a) your own vested accrued employee benefits under the Company's retirement benefit plan(s) and your right to reimbursement for any out-of-pocket business expenses authorized to be incurred and reimbursed pursuant to Company policies, as of the Separation Date, and pursuant to the Indemnification Agreement, for the term specified therein; (b) benefits and/or the right to seek benefits under applicable workers' compensation and/or unemployment compensation statutes; (c) pursue claims which by law cannot be waived by signing this Letter Agreement; (d) enforce this Letter Agreement; and/or (e) challenge the validity of this Letter Agreement.

8. Except as otherwise required by law, you agree not to disclose to anyone, either directly or indirectly, any information whatsoever regarding the existence or substance of this Letter Agreement, except your immediate family, attorneys, financial advisors, accountants and tax preparation professionals, provided that they agree to keep such information strictly confidential, except to the extent the existence and substance of this Letter Agreement is publicly disclosed by the Company in a filing with the Securities and Exchange Commission or as otherwise required by applicable law. You further agree not to make or publish any written or oral disparaging or defamatory statements regarding the Company, or its current or former vice presidents, officers or directors, or any of its current employees who are not vice presidents or officers, or any of its current agents and contractors. In connection with your resignation from the Company, you agree to follow the communication plan agreed upon in writing by you, John Maraganore and Kelley Boucher as of August 2, 2020. Violation of this paragraph shall be deemed a material breach of this Letter Agreement.

9. You hereby acknowledge that you lawfully entered into the NDA and that it currently remains in effect. In further consideration for the monies and benefits provided to you in this Letter Agreement, by signing this Letter Agreement, you are reaffirming the post-employment restrictive covenants and the other terms and conditions of the NDA, except that you agree that the non-competition and non-solicitation restriction period provided in Section 6 of the NDA shall hereby be revised to extend through September 22, 2022. You understand that the Company would not provide you with the benefits under this Letter Agreement but for your acknowledgment of these obligations and your agreement to extend the term of such non-competition and non-solicitation obligations under the NDA. You also affirm that, except as otherwise agreed in writing by the Company's Chief Human Resources Officer or Chief Legal Officer, you will return to the Company all keys, files, records (and copies thereof), equipment (including, but not limited to, computer hardware, software, printers, wireless handheld devices, cellular phones, etc.), Company identification, and any other Company-owned property in your possession or control on or before October 1, 2021 or earlier upon the written request of the Company if not required to perform consulting duties, and have left intact, and will for so long as you have access continue to keep intact, all electronic Company documents in your possession or control, including but not limited to, those that you developed or helped develop during your employment.

10. You acknowledge that you have been afforded until September 30, 2020, a period of more than twenty-one (21) days, to consider the meaning and effect of this Letter Agreement. You further understand and acknowledge that to be effective, this Letter Agreement must be signed and returned to the Company on the Separation Date. You are advised to consult with an attorney, and you acknowledge that you have had the opportunity to do so. You agree that any modifications, material or otherwise, do not restart or affect in any manner the original consideration period for the proposal made to you by the Company. If you do not sign and return this Letter Agreement on the Separation Date, you will not be eligible to receive the monies and benefits set forth in Paragraph No. 3 above.

11. You may revoke your acceptance of this Letter Agreement for a period of seven (7) business days following the day you sign it. Any revocation within this period must be submitted, in writing, to Kelley Boucher, Chief Human Resources Officer and state, "I hereby revoke my acceptance of the Letter Agreement and general release." The revocation must be personally delivered by email to kboucher@alnylam.com or by mail or courier service to Kelley Boucher, Chief Human Resources Officer, Alnylam Pharmaceuticals, Inc., 675 West Kendall Street – Henri A. Termeer Square, Cambridge, MA 02142, or postmarked within seven (7) business days of your signature of this Letter Agreement. This Letter Agreement shall not become effective or enforceable until the revocation period has expired with no revocation by you received by the Company. If the last day of the revocation period is a Saturday, Sunday, or legal holiday in Massachusetts then the revocation period shall not expire until the next following day which is not a Saturday, Sunday, or legal holiday.

12. This Letter Agreement, which will be construed under Massachusetts law, may not be modified, altered, or changed except upon express written consent of both parties wherein specific reference is made to this Letter Agreement. You agree that any claims or causes of action which arise out of or relate in any way to this Letter Agreement shall be instituted and litigated only in, and you voluntarily submit to the jurisdiction over your person by, the courts of the Commonwealth of Massachusetts, or if appropriate, a federal court located in Massachusetts (which courts, for purposes of this Letter Agreement, are the only courts of competent jurisdiction). **You and the Company waive the right to a trial by jury with respect to any such claims or causes of action or other proceeding.**

13. Nothing in this Letter Agreement prohibits or prevents you from filing a charge with or participating, testifying, or assisting in any investigation, hearing, or other proceeding before the U.S. Equal Employment Opportunity Commission, the National Labor Relations Board or a similar agency enforcing federal, state or local anti-discrimination laws. However, to the maximum extent permitted by law, you agree that if such an administrative claim is made to such an anti-discrimination agency, you will not be entitled to recover any individual monetary relief or other individual remedies. In addition, nothing in this Letter Agreement, including but not limited to the release of claims and the confidentiality and non-disparagement clauses, prohibits you from: (1) reporting possible violations of federal law or regulations, including any possible securities laws violations, to any governmental agency or entity, including but not limited to the U.S. Department of Justice, the Securities and Exchange Commission, the U.S. Congress, or any agency Inspector General; (2) making any other disclosures that are protected under the whistleblower provisions of federal law or regulations; or (3) otherwise fully participating in any federal whistleblower programs, including but not limited to any such programs managed by the Securities and Exchange Commission and/or the Occupational Safety and Health Administration. Moreover, nothing in this Letter Agreement prohibits or prevents you from receiving individual monetary awards or other individual relief by virtue of participating in such federal whistleblower programs.

14. You affirm that you have been paid and have received all leave (paid or unpaid), compensation, wages, bonuses, commissions, severance pay, and/or benefits to which you may be entitled and that no other leave (paid or unpaid), compensation, wages, bonuses, commissions, severance pay, and/or benefits are due to you, except as provided in this Letter Agreement. You further affirm that you have no known workplace injuries or occupational diseases and have been provided and/or have not been denied any leave requested under the Family and Medical Leave Act. You also affirm that you have not been retaliated against for reporting any allegations of wrongdoing by the Company or its officers, including any allegations of corporate fraud. In addition, you affirm that all decisions regarding your pay and benefits through the date of your signature of this Letter Agreement were not discriminatory based on age, disability, race, color, sex, religion, national origin or any other classification protected by law.

15. You agree to cooperate with the Company in any investigation, defense or prosecution of any claims, investigations, actions or other matters now in existence or which may be brought in the future against or on behalf of the Company, including (without limitation) with respect to the ongoing shareholder litigation pending in federal court in Massachusetts and in state court in New York. Your cooperation in connection with such claims, investigations or actions shall include, but not be limited to, being reasonably available to meet with the Company's counsel to prepare for discovery or any mediation, arbitration, trial, administrative hearing or other proceeding or to act as a witness when reasonably requested by the Company at mutually agreeable times and at locations mutually convenient to you and the Company. Nothing herein shall require you to provide anything other than truthful information. The Company shall reimburse you for all reasonable and documented out of pocket expenses incurred in the provision of such assistance. In the event that your cooperation and assistance with any such investigation, defense or prosecution of claims or other actions exceeds ten (10) hours per month during the Consulting Period or occurs after the expiration of the Consulting Period, including any time spent traveling at the request of the Company or as otherwise required to provide such assistance, the Company will pay you \$500 per hour or portion thereof for your assistance.

16. You agree that neither this Letter Agreement, nor the furnishing of consideration for this Letter Agreement, shall be deemed or construed at any time for any purpose as an admission by the Company of any liability or unlawful conduct of any kind. Should any provision of this Letter Agreement be declared illegal or unenforceable by any court of competent jurisdiction and cannot be modified to be enforceable, excluding the general release language, such provision shall immediately become null and void, leaving the remainder of this Letter Agreement in full force and effect. However, if the general release is found to be invalid, you agree to execute a valid release of the claims which are the subject of this Letter Agreement and/or are referred to in the general release paragraph above.

17. This Letter Agreement, which includes a general release, represents the complete agreement between you and the Company, and fully supersedes any prior agreements or understandings between the parties, other than (a) your NDA referred to in Paragraph No. 9, as amended herein, (b) your Indemnification Agreement referred to in Paragraph No. 5, (c) any stock incentive plan and any award agreement evidencing an equity award under any stock incentive plan, and (d) the provisions of the Company's Clawback Policy. You acknowledge that you have not relied on any representations, promises, or agreements of any kind made to you in connection with your decision to sign this Letter Agreement, except those set forth in this Letter Agreement.

18. This Letter Agreement may be signed in counterparts, each of which when so signed shall be deemed an original, and the counterparts together shall constitute one and the same agreement. A copied, scanned or faxed signature shall be treated the same as an original.

19. Although the Company does not guarantee the tax treatment of any payments under this Letter Agreement, the intent of the parties is that the payments and benefits hereunder be exempt from, or comply with, Section 409A of the Internal Revenue Code of 1986, as amended, and all Treasury Regulations and guidance promulgated thereunder (“Code Section 409A”) and to the maximum extent permitted this Letter Agreement shall be limited, construed and interpreted in accordance with such intent. In no event whatsoever shall the Company or its affiliates or their respective officers, directors, employees or agents be liable for any additional tax, interest or penalties that may be imposed on you by Code Section 409A or damages based upon payments and/or benefits payable hereunder not being exempt from or not complying with Code Section 409A, unless such failure is due to breach of this Letter Agreement by the Company. If a payment made under this Letter Agreement that is nonqualified deferred compensation subject to Code Section 409A may be made in more than one taxable year depending on when you sign this Letter Agreement, payment shall be made in the second taxable year. Notwithstanding any other provision of this Letter Agreement to the contrary, to the extent that any reimbursement of expenses constitutes “deferred compensation” under Code Section 409A, such reimbursement shall be provided no later than December 31 of the year following the year in which the expense was incurred. The amount of expenses reimbursed in one year shall not affect the amount eligible for reimbursement in any subsequent year. The amount of any in-kind benefits provided in one year shall not affect the amount of in-kind benefits provided in any other year. For purposes of Code Section 409A (including, without limitation, for purposes of Treasury Regulation Section 1.409A-2(b)(2)(iii)), the right to receive payments in the form of installment payments shall be treated as a right to receive a series of separate payments and, accordingly, each installment payment shall at all times be considered a separate and distinct payment. Whenever a payment under this Letter Agreement may be paid within a specified period, the actual date of payment within the specified period shall be within the sole discretion of the Company. Notwithstanding any other provision of this Agreement to the contrary, if at the time of your separation from service (as defined in Code Section 409A), you are a “Specified Employee”, then the Company will defer the payment or commencement of any nonqualified deferred compensation subject to Code Section 409A payable upon separation from service (without any reduction in such payments or benefits ultimately paid or provided to you) until the date that is six (6) months following separation from service or, if earlier, the earliest other date as is permitted under Code Section 409A (and any amounts that otherwise would have been paid during this deferral period will be paid in a lump sum on the day after the expiration of the six (6) month period or such shorter period, if applicable). You will be a “Specified Employee” for purposes of this Letter Agreement if, on the date of your separation from service, you are an individual who is, under the method of determination adopted by the Company designated as, or within the category of employees deemed to be, a “Specified Employee” within the meaning and in accordance with Treasury Regulation Section 1.409A-1(i).

The Company would like to extend its profound gratitude and appreciation to you for your leadership and countless contributions to the growth and success of the Company over many years of service, and would also like to express its sincere hope for success in the next chapter of your distinguished career in the life sciences for the benefit of patients.

Very truly yours,

/s/ Kelley Boucher

Kelley Boucher
Chief Human Resources Officer

You have been advised in writing that you have until the Separation Date, which is a period of more than twenty-one (21) days, to consider this Letter Agreement, and that it must be signed and returned on the Separation Date to be effective. You have also been advised to consult with an attorney prior to the execution of this Letter Agreement.

Having elected to execute this Letter Agreement, to fulfill the promises set forth in this Letter Agreement, and to receive thereby the sums and benefits set forth in Paragraph No. 3 above, you freely and knowingly, and after due consideration, enter into this Letter Agreement intending to waive, settle, and release all claims you have or might have against the Company, its subsidiaries, divisions and affiliates, its present or former officers, directors, trustees, employees, agents, insurers, or successors or assigns.

Date: 09/30/2020 /s/ Barry E. Greene
Barry E. Greene

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: November 5, 2020

/s/ John M. Maraganore

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

CERTIFICATION

I, Jeffrey V. Poulton, 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: November 5, 2020

/s/ Jeffrey V. Poulton

Jeffrey V. Poulton
Executive Vice President, Chief Financial Officer

**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 September 30, 2020 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: November 5, 2020

/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.

**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 September 30, 2020 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), the undersigned, Jeffrey V. Poulton, Executive 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: November 5, 2020

/s/ Jeffrey V. Poulton

Jeffrey V. Poulton
Executive 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.