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

FORM S-3
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

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 Number)

**675 West Kendall Street
Henri A. Termeer Square
Cambridge, Massachusetts 02142
(617) 551-8200**

(Address, Including Zip Code, and Telephone Number, Including Area Code, of Registrant's Principal Executive Offices)

**John M. Maraganore , Ph.D.
Chief Executive Officer
Alnylam Pharmaceuticals, Inc.
675 West Kendall Street
Henri A. Termeer Square
Cambridge, Massachusetts 02142
(617) 551-8200**

(Name, Address, Including Zip Code, and Telephone Number, Including Area Code, of Agent for Service)

Copy to:

**Mitchell S. Bloom, Esq.
Goodwin Procter LLP
100 Northern Avenue
Boston, MA 02210
(617) 570-1000**

Approximate date of commencement of proposed sale to the public: From time to time after this registration statement becomes effective.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box. ☐

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box. ☒

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If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box. ☒

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box. ☐

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

Large accelerated filer	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered(1)	Amount to be Registered(1)	Proposed Maximum Offering Price Per Share (2)	Proposed Maximum Aggregate Offering Price(2)	Amount of Registration Fee
Common Stock, par value \$0.01 per share	963,486 shares	\$136.42	\$131,433,942.69	\$17,060.13
(1) Pursuant to Rule 416(a) of the Securities Act of 1933, as amended, this Registration Statement shall also cover any additional shares of the Registrant’s common stock that become issuable by reason of any stock dividend, stock split, recapitalization or other similar transaction effected without receipt of consideration that increases the number of the Registrant’s outstanding shares of common stock.				
(2) Estimated in accordance with Rule 457(c) solely for purposes of calculating the registration fee on the basis of the average of the high and low prices of the Registrant’s common stock as reported on the Nasdaq Global Select Market on June 3, 2020.				

PROSPECTUS

Alnylam Pharmaceuticals, Inc.

963,486 Shares of Common Stock

This prospectus relates to the proposed resale or other disposition of up to 963,486 shares of Alnylam Pharmaceuticals, Inc. common stock, par value \$0.01 per share, by the selling stockholders identified in this prospectus. All of the shares are outstanding shares of common stock held by the selling stockholders. We are not selling any shares of common stock under this prospectus and will not receive any of the proceeds from the sale or other disposition of common stock by the selling stockholders.

The selling stockholders (which term as used herein includes their respective donees, pledgees, transferees or other successors in interest) may offer and sell or otherwise dispose of the shares of common stock described in this prospectus from time to time. The selling stockholders will bear all commissions and discounts, if any, attributable to the sales of shares. We will bear all other costs, expenses and fees in connection with the registration of the shares. See “Plan of Distribution” beginning on page 9 for more information about how the selling stockholders may sell or dispose of their shares of common stock.

Our common stock trades on the Nasdaq Global Select Market under the symbol “ALNY”. On June 3, 2020, the last reported sale price for our common stock on the Nasdaq Global Select Market was \$137.25 per share.

INVESTING IN THESE SECURITIES INVOLVES CERTAIN RISKS. PLEASE READ THE INFORMATION UNDER THE HEADING “[RISK FACTORS](#)” ON PAGE 4 OF THIS PROSPECTUS AND IN THE DOCUMENTS INCORPORATED BY REFERENCE IN THIS PROSPECTUS FOR A DISCUSSION OF THE FACTORS YOU SHOULD CAREFULLY CONSIDER BEFORE DECIDING TO PURCHASE THESE SECURITIES.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is June 5, 2020

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, which we refer to as the SEC, utilizing a “shelf” registration process. Under this shelf registration process, certain selling stockholders may from time to time sell any combination of the securities described in this prospectus in one or more offerings.

Neither we nor the selling stockholders have authorized anyone to provide any information other than that contained or incorporated by reference in this prospectus. Neither we nor the selling stockholders take responsibility for, and can provide no assurance as to the reliability of, any other information others may give you. The selling stockholders are offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where it is lawful to do so. This prospectus does not constitute an offer to sell or the solicitation of an offer to buy any shares other than the registered shares to which they relate, nor does this prospectus constitute an offer to sell or the solicitation of an offer to buy shares in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction. You should not assume that the information contained in this prospectus is accurate on any date subsequent to the date set forth on the front of the document or that any information we have incorporated by reference is correct on any date subsequent to the date of the document incorporated by reference, even though this prospectus is delivered or shares are sold on a later date. Our business, financial condition, results of operations and prospects may have changed materially since those dates.

Unless the context otherwise indicates, references in this prospectus to “Alnylam,” “we,” “our,” “us” and “the Company” refer, collectively, to Alnylam Pharmaceuticals, Inc., a Delaware corporation, and its consolidated subsidiaries.

ABOUT ALNYLAM PHARMACEUTICALS, INC.

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 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 Alnylam 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 *Alnylam 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 for the treatment of hATTR amyloidosis in adult patients with stage 1 or stage 2 polyneuropathy, Japan for the treatment of transthyretin type familial amyloidosis with polyneuropathy, and in several additional countries. Regulatory filings in other territories are pending and additional filings are planned for 2020. In November 2019, we received regulatory approval for GIVLAARI from 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 for the treatment of AHP in adults and adolescents aged 12 years and older. We have also filed a marketing authorisation application, or MAA, for givosiran (the non-branded drug name for GIVLAARI) in Brazil and additional regulatory filings are planned for 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 April 2020, based on the positive ILLUMINATE-A data, 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

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under the Prescription Drug User Fee Act, and has indicated that they are not currently planning an advisory committee meeting as part of the NDA review. Additionally, on March 31, 2020, we submitted an MAA for lumasiran with the European Medicines Agency, or EMA. Lumasiran was previously granted an accelerated assessment by the EMA.

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

In April 2020, we entered into a strategic financing collaboration, or the Collaboration, with The Blackstone Group Inc., or Blackstone, to accelerate our advancement of RNAi therapeutics. In connection with the collaboration, Blackstone and its affiliates will provide us up to \$2.0 billion in financing, including \$1.0 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, subject to completion of a definitive agreement. As part of the Collaboration, certain affiliates of Blackstone also purchased an aggregate of \$100.0 million of our common stock.

Our principal executive offices are located at 675 West Kendall Street, Henri A. Termeer Square, Cambridge, Massachusetts 02142, and our telephone number is (617) 551-8200.

RISK FACTORS

Investment in any securities offered pursuant to this prospectus involves risks. You should carefully consider the risk factors incorporated by reference to our most recent Annual Report on Form 10-K, Quarterly Reports on Form 10-Q or Current Reports on Form 8-K, and all other information contained or incorporated by reference into this prospectus, as updated by our subsequent filings under the Securities Exchange Act of 1934, as amended, or the Exchange Act, and the risk factors and other information contained in the applicable prospectus supplement before acquiring any of such securities. The occurrence of any of these risks might cause you to lose all or part of your investment in the offered securities.

FORWARD-LOOKING STATEMENTS

This prospectus and the information incorporated by reference in this prospectus include “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Exchange Act. Without limiting the foregoing, the words “may,” “will,” “should,” “could,” “expects,” “plans,” “intends,” “anticipates,” “believes,” “estimates,” “predicts,” “potential,” “continue,” “target,” “goal” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these words. All forward-looking statements included in this prospectus are based on information available to us up to, and including, the date of this document, and we assume no obligation to update any such forward-looking statements to reflect events or circumstances that arise after the date hereof. Our actual results could differ materially from those anticipated in these forward-looking statements as a result of certain important factors, including those contained in or incorporated by reference into this prospectus and in the sections entitled “Risk Factors” in our most recent Annual Report on Form 10-K, Quarterly Reports on Form 10-Q or Current Reports on Form 8-K. You should carefully review those factors and also carefully review the risks outlined in other documents that we file from time to time with the SEC. 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 a future pandemic, such as the scope and duration of the outbreak, 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 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 the pandemic, and our ability to execute business continuity plans to address disruptions caused by the COVID-19 or a future pandemic;
- our views and plans 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 expectations regarding our collaboration with Blackstone and the potential acceleration of its commercial products and pipeline resulting from the non-dilutive growth capital;
- our belief that the funding provided by Blackstone should enable us to achieve a self-sustainable profile without the need for future equity financing;
- 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 or any of our product candidates by our contract manufacturers or by us;

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- our progress continuing to build and leverage commercial and ex-United States, or U.S., 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 and our 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 expectations regarding the length of time our current cash, cash equivalents and marketable debt and equity securities will support our operations based on our current operating plan;
- our belief that 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;
- 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 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 our most recent Quarterly Report on Form 10-Q.

USE OF PROCEEDS

We are registering these shares pursuant to registration rights granted to the selling stockholders. We are not selling any shares of common stock under this prospectus and will not receive any of the proceeds from the sale of shares of our common stock in this offering. The selling stockholders will receive all of the proceeds from this offering.

The selling stockholders will pay any underwriting discounts and commissions and expenses incurred by the selling stockholders for brokerage, accounting, tax or legal services or any other expenses incurred by the selling stockholders in effecting the registration of and disposing of the shares. We will bear all other costs, fees and expenses incurred in effecting the registration of the shares covered by this prospectus, including, without limitation, all registration and filing fees and fees and expenses of our counsel and our independent registered public accountants.

SELLING STOCKHOLDERS

On April 10, 2020, we entered into a Stock Purchase Agreement with the selling stockholders, or the SPA, pursuant to which the selling stockholders acquired the shares of common stock that may be offered under this prospectus. This prospectus covers the sale or other disposition by the selling stockholders of up to the total number of shares of common stock held by the selling stockholders subject to the SPA.

We are registering the above-referenced shares to permit each of the selling stockholders to resell or otherwise dispose of the shares in the manner contemplated under “Plan of Distribution” below.

None of the selling stockholders has, or within the past three years has had, any position, office or, except in connection with the Collaboration, other material relationship with us.

The following table sets forth the name of each selling stockholder, the number of shares owned by each of the respective selling stockholders, the number of shares that may be offered under this prospectus and the number of shares of our common stock owned by the selling stockholders assuming all of the shares covered hereby are sold. The number of shares in the column “Number of Shares Being Offered” represents all of the shares that a selling stockholder may offer under this prospectus. The selling stockholders may sell some, all or none of their shares. We do not know how long the selling stockholders will hold the shares before selling them, and we currently have no agreements, arrangements or understandings with the selling stockholders regarding the sale or other disposition of any of the shares, other than an agreement with the selling stockholders not to dispose of any shares prior to July 9, 2020, except as set forth in the SPA. The shares covered hereby may be offered from time to time by the selling stockholders.

The information set forth below is based upon information obtained from the selling stockholders and upon information in our possession regarding the issuance of shares of common stock to the selling stockholders in connection with the private placement transaction. The percentages of shares owned after the offering are based on 115,356,951 shares of our common stock outstanding as of June 4, 2020, including the shares of common stock covered hereby.

<u>Name of Selling Stockholders</u>	<u>Shares of Common Stock Beneficially Owned Prior to Offering(1)</u>	<u>Number of Shares Being Offered</u>	<u>Shares of Common Stock Beneficially Owned After Offering(2)</u>	
			<u>Number</u>	<u>Percent</u>
Funds affiliated with Blackstone(3)	963,486	963,486	—	—

- (1) “Beneficial ownership” is a term broadly defined by the SEC in Rule 13d-3 under the Exchange Act, and includes more than the typical form of stock ownership, that is, stock held in the person’s name. The term also includes what is referred to as “indirect ownership,” meaning ownership of shares as to which a person has or shares investment power. For purposes of this table, a person or group of persons is deemed to have “beneficial ownership” of any shares underlying options and other purchase rights that are currently exercisable or exercisable within 60 days of June 4, 2020.
- (2) Assumes that all shares being registered in this prospectus are resold to third parties and that with respect to a particular selling stockholder, such selling stockholder sells all shares of common stock registered under this prospectus held by such selling stockholder.
- (3) Consists of (i) 508,766 shares of common stock held by BXLS V - Bodyguard, L.P., (ii) 8,625 shares of common stock held by BXLS Family Investment Partnership (CYM) V - ESC L.P., (iii) 519 shares of common stock held by Blackstone Family Tactical Opportunities Investment Partnership III ESC L.P., (iv) 119,917 shares of common stock held by BTO Bodyguard Holdings DE L.P., (v) 89,122 shares of common stock held by GSO Capital Opportunities Fund III L.P., (vi) 89,123 shares of common stock held by GSO CSF III Holdco LP, and (vii) 147,414 shares of common stock held by BEMAP Master Fund Ltd. (collectively, the “Blackstone Funds”).

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Blackstone Life Sciences Associates V (CYM) L.L.C. is the general partner of BXLS V - Bodyguard, L.P. Blackstone Clarus GP L.P. is the sole member of Blackstone Life Sciences Associates V (CYM) L.L.C. Blackstone Clarus GP L.L.C. is the general partner of Blackstone Clarus GP L.P. Blackstone Life Sciences V (CYM) AIV GP L.P. is the general partner of BXLS Family Investment Partnership (CYM) V - ESC L.P. BXLS V L.L.C. is the general partner of Blackstone Life Sciences V (CYM) AIV GP L.P. Blackstone Holdings II L.P. is the sole member of Blackstone Clarus GP L.L.C. and the managing member of BXLS V L.L.C. Blackstone Holdings I/II GP L.L.C. is the general partner of Blackstone Holdings II L.P.

BTO Side-by-Side GP L.L.C. is the general partner of Blackstone Family Tactical Opportunities Investment Partnership III ESC L.P. BTO Holdings Manager L.L.C. is the general partner of BTO Bodyguard Holdings DE L.P. Blackstone Tactical Opportunities Associates L.L.C. is the managing member of BTO Holdings Manager L.L.C. BTOA L.L.C. is the sole member of Blackstone Tactical Opportunities Associates L.L.C. Blackstone Holdings III L.P. is the managing member of BTOA L.L.C. and the sole member of BTO Side-by-Side GP L.L.C. Blackstone Holdings III GP L.P. is the general partner of Blackstone Holdings III L.P. Blackstone Holdings III GP Management L.L.C. is the general partner of Blackstone Holdings III GP L.P.

GSO Capital Opportunities Associates III LLC is the general partner of GSO Capital Opportunities Fund III LP. GSO Capital Solutions Associates III LP is the general partner of GSO CSF III Holdco LP. GSO Capital Solutions Associates III (Delaware) LLC is a general partner of GSO Capital Solutions Associates III LP. GSO Holdings I L.L.C. is the sole or managing member of GSO Capital Opportunities Associates III LLC. and GSO Capital Solutions Associates III (Delaware) LLC. Blackstone Holdings II L.P. is the managing member of GSO Holdings I L.L.C.

Blackstone Alternative Asset Management L.P. is the investment advisor of BEMAP Master Fund Ltd. Blackstone Holdings I-Sub (BAAM) GP L.L.C. is the general partner of Blackstone Alternative Asset Management L.P. Blackstone Intermediary Holdco L.L.C. is the sole member of Blackstone Holdings I-Sub (BAAM) GP L.L.C. Blackstone Advisory Partners L.P. is the sole member of Blackstone Intermediary Holdco L.L.C. Blackstone Advisory Services L.L.C. is the general partner of Blackstone Advisory Partners L.P. Blackstone Holdings I L.P. is the sole member of Blackstone Advisory Services L.L.C. Blackstone Holdings I/II GP L.L.C. is the general partner of Blackstone Holdings I L.P.

The Blackstone Group Inc. is the sole member of Blackstone Holdings I/II GP L.L.C. and Blackstone Holdings III GP Management L.L.C. The sole holder of the Class C common stock of The Blackstone Group Inc. is Blackstone Group Management L.L.C. Blackstone Group Management L.L.C. is wholly-owned by Blackstone's senior managing directors and controlled by its founder, Stephen A. Schwarzman. Each of such entities and Mr. Schwarzman may be deemed to beneficially own the shares beneficially owned by the Blackstone Funds controlled by it or him, but each (other than the Blackstone Funds to the extent of their direct ownership disclaims beneficial ownership of such shares. The address for the BXLS V - Bodyguard, L.P. and BXLS Family Investment Partnership (CYM) V - ESC L.P. is 101 Main Street, Suite 1210, Cambridge, MA 02142. The address for each of the other entities in this footnote and Mr. Schwarzman is 345 Park Avenue, New York, New York 10154.

PLAN OF DISTRIBUTION

The selling stockholders and their pledgees, donees, transferees or other successors in interest may offer sell the shares of common stock from time to time on Nasdaq or any other national securities exchange or quotation service on which the shares may be listed at the time of sale, in the over-the-counter market, through ordinary brokerage trades, pursuant to underwritten public offerings, negotiated transactions, block trades or a combination of these methods or through underwriters or broker-dealers, through agents and/or directly to one or more purchasers, or by any other legally available means. The shares of common stock may be distributed from time to time in one or more transactions:

- at a fixed price or prices, which may be changed;
- at market prices prevailing at the time of sale;
- at prices related to such prevailing market prices; or
- at negotiated prices.

The selling stockholders may also sell shares under Rule 144 under the Securities Act, if available, or Section 4(a)(1) under the Securities Act rather than under this prospectus, provided that they meet the criteria and conform to the requirements of those provisions.

If the selling stockholders effect such transactions by selling shares of common stock to or through underwriters, broker-dealers or agents, such underwriters, broker-dealers or agents engaged by the selling stockholders may arrange for other broker-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the selling stockholders (or, if any broker-dealer acts as agent for the purchaser of shares, from the purchaser) in amounts to be negotiated.

The selling stockholders may, from time to time, pledge or grant a security interest in some or all of the shares of common stock owned by them and, if they default in the performance of their secured obligations, the pledgees or secured parties may offer and sell the shares of common stock from time to time under this prospectus, or under a supplement or amendment to this prospectus amending, if necessary, the list of selling stockholders to include the pledgee, transferee or other successors in interest as selling stockholders under this prospectus.

The selling stockholders have informed us that, except as set forth below, none of them have any agreement or understanding, directly or indirectly, with any person to distribute the common stock. If any selling stockholder notifies us that a material arrangement has been entered into with a broker-dealer for the sale of shares through a block trade, special offering or secondary distribution or a purchase by a broker or dealer, we may be required to file a prospectus supplement pursuant to the applicable rules promulgated under the Securities Act. Certain selling stockholders who are entities rather than natural persons may distribute shares to their partners, shareholders or other owners in normal course, who may in turn sell the shares in the manner listed above. The selling stockholders also may transfer the shares of common stock in other circumstances, in which case the transferees, pledgees or other successors in interest will be the selling beneficial owners for purposes of this prospectus.

In connection with the sale of the shares of common stock or interests in shares of common stock, the selling stockholders may enter into hedging transactions after the effective date of the registration statement of which this prospectus is a part with broker-dealers or other financial institutions, which may in turn engage in short sales of the common stock in the course of hedging the positions they assume. The selling stockholders may also sell shares of common stock short after the effective date of the registration statement of which this prospectus is a part and deliver these securities to close out their short positions, or loan or pledge the common stock to broker-dealers that in turn may sell these securities. The selling stockholders may also enter into option or other transactions after the effective date of the registration statement of which this prospectus is a part with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the

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delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction). The selling stockholders and any broker-dealers or agents that are involved in selling the shares may be deemed to be “underwriters” within the meaning of the Securities Act in connection with such sales. In such event, any commissions received by such broker-dealers or agents and any profit on the resale of the shares purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Any selling stockholder who is an “underwriter” within the meaning of the Securities Act will be subject to the prospectus delivery requirements of the Securities Act and the provisions of the Exchange Act and the rules thereunder relating to stock manipulation. We have advised the selling stockholders that they are required to comply with Regulation M promulgated under the Exchange Act during such time as they may be engaged in a distribution of the shares. The foregoing may affect the marketability of the common stock.

The aggregate proceeds to the selling stockholders from the sale of the common stock offered by them will be the purchase price of the common stock less discounts or commissions, if any. Each of the selling stockholders reserves the right to accept and, together with their agents from time to time, to reject, in whole or in part, any proposed purchase of common stock to be made directly or through agents. We will not receive any of the proceeds from this offering.

We have agreed to pay all fees and expenses incident to the registration and listing of the shares of common stock owned by the selling stockholders, other than the legal fees of counsel for any party other than us. We have agreed to reimburse the selling stockholders for certain expenses incurred by them in connection with the SPA and registration of shares of common stock. The selling stockholders will pay any underwriting discounts and commissions and expenses incurred by the selling stockholders for brokerage, accounting, tax or legal services or any other expenses incurred by the selling stockholders in effecting the registration of and disposing of the shares. We have agreed to indemnify the selling stockholders against certain losses, damages and liabilities, including liabilities under the Securities Act, the Exchange Act or otherwise.

We have agreed with the selling stockholders to use our commercially reasonable efforts to keep the registration statement of which this prospectus constitutes a part effective for a period of up to one year or, if earlier, until such time as any securities registered pursuant to the SPA cease to become Registrable Securities as defined in the SPA.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at <http://www.sec.gov>. Copies of certain information filed by us with the SEC are also available on our website at www.alnylam.com. The information on our website is not incorporated by reference into this prospectus and should not be considered to be a part of this prospectus. Our website address is included in this prospectus as an inactive technical reference only.

This prospectus is part of a registration statement we filed with the SEC. The registration statement contains more information than this prospectus regarding us and our common stock, including certain exhibits and schedules. With respect to the statements contained in this prospectus regarding the contents of any agreement or any other document, in each instance, the statement is qualified in all respects by the complete text of the agreement or document, a copy of which has been filed as an exhibit to the registration statement. You can obtain a copy of the registration statement from the SEC's website.

INCORPORATION BY REFERENCE

The SEC allows us to incorporate by reference much of the information we file with the SEC, which means that we can disclose important information to you by referring you to those publicly available documents. The information that we incorporate by reference in this prospectus is considered to be part of this prospectus. Because we are incorporating by reference future filings with the SEC, this prospectus is continually updated and those future filings may modify or supersede some of the information included or incorporated in this prospectus. This means that you must look at all of the SEC filings that we incorporate by reference to determine if any of the statements in this prospectus or in any document previously incorporated by reference have been modified or superseded.

This prospectus incorporates by reference the documents listed below (File No. 001-36407) and any future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act (in each case, other than those documents or the portions of those documents not deemed to be filed) until the offering of the securities under the registration statement is terminated or completed:

- Annual Report on [Form 10-K](#) for the fiscal year ended December 31, 2019, filed with the SEC on February 13, 2020;
- The information specifically incorporated by reference into the Annual Report on Form 10-K for the fiscal year ended December 31, 2019 from our definitive proxy statement on [Schedule 14A](#) (other than information furnished rather than filed), filed with the SEC on March 23, 2020;
- Quarterly Report on [Form 10-Q](#) for the fiscal quarter ended March 31, 2020, filed with the SEC on May 6, 2020;
- Current Reports on Form 8-K filed on [February 27, 2020](#), [April 6, 2020](#) (but excluding Item 7.01 and the corresponding exhibit), [April 13, 2020](#) (but excluding Item 7.01 and the corresponding exhibit), and [May 11, 2020](#); and
- The description of our common stock contained in our Registration Statement on [Form 8-A](#) filed on April 8, 2014, including any amendments or reports filed for the purpose of updating such description.

You may request a copy of these filings, at no cost, by writing or telephoning us at the following address and phone number:

Alnylam Pharmaceuticals, Inc.
675 West Kendall Street
Henri A. Termeer Square
Cambridge, Massachusetts 02142
Attn: Investor Relations
(617) 551-8200

LEGAL MATTERS

The validity of the shares of common stock offered hereby will be passed upon for us by Goodwin Procter LLP, Boston, Massachusetts.

EXPERTS

The financial statements and management's assessment of the effectiveness of internal control over financial reporting (which is included in Management's Annual Report on Internal Control Over Financial Reporting) incorporated in this Prospectus by reference to the Annual Report on Form 10-K for the year ended December 31, 2019 have been so incorporated in reliance on the report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

ALNYLAM PHARMACEUTICALS, INC.

963,486 Shares of Common Stock

PROSPECTUS

June 5, 2020

PART II.
INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution.

Set forth below is an estimate (except in the case of the registration fee) of the amount of fees and expenses to be incurred in connection with the issuance and distribution of the offered securities, other than underwriting discounts and commissions. All fees and expenses including the amounts set forth below, other than underwriting discounts and commissions and the legal fees of counsel for any party other than us, incurred in connection with the sale of the offered securities will be borne by us.

SEC registration fee	\$ 17,060.13
Legal fees and expenses	\$ 40,000.00
Accounting fees and expenses	\$ 15,000.00
Total	<u>\$ 72,060.13</u>

Item 15. Indemnification of Directors and Officers.

Section 145 of the General Corporation Law of the State of Delaware, or the DGCL, provides, generally, that a corporation shall have the power to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding (except actions by or in the right of the corporation) by reason of the fact that such person is or was a director, officer, employee or agent of the corporation against all expenses, judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding if such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the corporation and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful. A corporation may similarly indemnify such person for expenses actually and reasonably incurred by such person in connection with the defense or settlement of any action or suit by or in the right of the corporation, *provided* that such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation, and, in the case of claims, issues and matters as to which such person shall have been adjudged liable to the corporation, *provided* that a court shall have determined, upon application, that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which such court shall deem proper.

Section 102(b)(7) of the DGCL provides, generally, that the certificate of incorporation may contain a provision eliminating or limiting the personal liability of a director to the corporation or its shareholders for monetary damages for breach of fiduciary duty as a director, *provided* that such provision may not eliminate or limit the liability of a director (i) for any breach of the director's duty of loyalty to the corporation or its shareholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under section 174 of the DCGL, or (iv) for any transaction from which the director derived an improper personal benefit. No such provision may eliminate or limit the liability of a director for any act or omission occurring prior to the date when such provision became effective.

Our certificate of incorporation provides that we must indemnify our directors to the fullest extent permitted by Delaware law, and we are required to advance expenses, as incurred, to our directors in connection with a legal proceeding to the fullest extent permitted by Delaware law.

We have entered into indemnification agreements with our directors and certain of our officers, in addition to the indemnification provided for in our certificate of incorporation, and intend to enter into indemnification agreements with any new directors and certain officers in the future. We have purchased and intends to maintain insurance on behalf of any person who is or was a director or officer against any loss arising from any claim asserted against him or her and incurred by him or her in any such capacity, subject to certain exclusions.

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Item 16. Exhibits.

<u>Exhibit No.</u>	<u>Description</u>
3.1	<u>Restated Certificate of Incorporation of the Registrant (filed as Exhibit 3.1C to the Registrant's Current Report on Form 8-K filed on April 26, 2019 (File No. 001-36407) and incorporated herein by reference)</u>
3.2	<u>Amended and Restated Bylaws of the Registrant, as amended (filed as Exhibit 3.2 to the Registrant's Annual Report on Form 10-K filed on February 13, 2020 (File No. 001-36407) for the year ended December 31, 2019 and incorporated herein by reference)</u>
4.1	<u>Specimen certificate evidencing shares of common stock (filed as Exhibit 4.1 to the Registrant's Registration Statement on Form S-1 (File No. 333-113162) and incorporated herein by reference)</u>
4.2#	<u>Stock Purchase Agreement by and among the Registrant and the investors listed in Exhibit A thereto, dated April 10, 2020</u>
5.1#	<u>Opinion of Goodwin Procter LLP</u>
23.1#	<u>Consent of PricewaterhouseCoopers LLP, an Independent Registered Public Accounting Firm</u>
23.2#	<u>Consent of Goodwin Procter LLP (included in Exhibit 5.1)</u>
24.1#	<u>Powers of Attorney (included in the signature pages to the Registration Statement)</u>
#	Filed herewith.

Item 17. Undertakings.

The undersigned Registrant hereby undertakes:

- (1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:
 - (i) to include any prospectus required by Section 10(a)(3) of the Securities Act of 1933, as amended, or the Securities Act of 1933;
 - (ii) to reflect in the prospectus any facts or events arising after the effective date of this registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in this registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and
 - (iii) to include any material information with respect to the plan of distribution not previously disclosed in this registration statement or any material change to such information in this registration statement;

provided, however, that paragraphs (1)(i), (1)(ii) and (1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the Registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as

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amended (the “Exchange Act”), that are incorporated by reference in this registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of this registration statement.

- (2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at the time shall be deemed to be the initial *bona fide* offering thereof.
- (3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.
- (4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:
 - (i) each prospectus filed by the Registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and
 - (ii) each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii) or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.
- (5) That, for the purpose of determining liability of the Registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned Registrant undertakes that in a primary offering of securities of such undersigned Registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, such undersigned Registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:
 - (i) any preliminary prospectus or prospectus of such undersigned Registrant relating to the offering required to be filed pursuant to Rule 424;
 - (ii) any free writing prospectus relating to the offering prepared by or on behalf of such undersigned Registrant or used or referred to by such undersigned Registrant;
 - (iii) the portion of any other free writing prospectus relating to the offering containing material information about such undersigned Registrant or its securities provided by or on behalf of such undersigned Registrant; and
 - (iv) any other communication that is an offer in the offering made by such undersigned Registrant to the purchaser.
- (6) That, for purposes of determining any liability under the Securities Act of 1933, each filing of the Registrant’s annual report pursuant to Section 13(a) or 15(d) of the Exchange Act (and, where

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applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in this registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the Registrant pursuant to the indemnification provisions described herein, or otherwise, the Registrant has been advised that in the opinion of the Commission such indemnification is against public policy as expressed in the Securities Act of 1933 and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act of 1933 and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Cambridge, Commonwealth of Massachusetts, on this 5th day of June, 2020.

ALNYLAM PHARMACEUTICALS, INC.

By: /s/ John M. Maraganore
Name: John M. Maraganore, Ph.D.
Title: Chief Executive Officer

SIGNATURES AND POWER OF ATTORNEY

We, the undersigned officers and directors of Alnylam Pharmaceuticals, Inc. hereby severally constitute and appoint John M. Maraganore and Jeffrey V. Poulton, and each of them singly, our true and lawful attorneys with full power to any of them, and to each of them singly, to sign for us and in our names in the capacities indicated below the Registration Statement on Form S-3 filed herewith and any and all amendments (including post-effective amendments) to said Registration Statement (or any other registration statement for the same offering that is to be effective upon filing pursuant to Rule 462 under the Securities Act of 1933, as amended) and generally to do all such things in our name and behalf in our capacities as officers and directors to enable Alnylam Pharmaceuticals, Inc. to comply with the provisions of the Securities Act of 1933, as amended, and all requirements of the Securities and Exchange Commission, hereby ratifying and confirming our signatures as they may be signed by our said attorneys, or any of them, to said Registration Statement and any and all amendments (including post-effective amendments) thereto.

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ John M. Maraganore</u> John M. Maraganore, Ph.D.	Chief Executive Officer and Director (Principal Executive Officer)	June 5, 2020
<u>/s/ Jeffrey V. Poulton</u> Jeffrey V. Poulton	Executive Vice President and Chief Financial Officer (Principal Financial and Accounting Officer)	June 5, 2020
<u>/s/ Dennis A. Ausiello</u> Dennis A. Ausiello, M.D.	Director	June 5, 2020
<u>/s/ Michael W. Bonney</u> Michael W. Bonney	Director	June 5, 2020
<u>/s/ Olivier Brandicourt</u> Olivier Brandicourt, M.D.	Director	June 5, 2020

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<u>/s/ Marsha H. Fanucci</u> Marsha H. Fanucci	Director	June 5, 2020
<u>/s/ Margaret A. Hamburg</u> Margaret A. Hamburg, M.D.	Director	June 5, 2020
<u>/s/ Steven M. Paul</u> Steven M. Paul, M.D.	Director	June 5, 2020
<u>/s/ David E.I. Pyott</u> David E.I. Pyott	Director	June 5, 2020
<u>/s/ Colleen F. Reitan</u> Colleen F. Reitan	Director	June 5, 2020
<u>/s/ Amy W. Schulman</u> Amy W. Schulman	Director	June 5, 2020
<u>/s/ Phillip A. Sharp</u> Phillip A. Sharp, Ph.D.	Director	June 5, 2020

STOCK PURCHASE AGREEMENT
BY AND AMONG
THE INVESTORS LISTED HEREIN
AND
ALNYLAM PHARMACEUTICALS, INC.
DATED AS OF APRIL 10, 2020

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Exhibit A – Schedule of Investors

Exhibit B – Notices

STOCK PURCHASE AGREEMENT

THIS STOCK PURCHASE AGREEMENT (this “**Agreement**”), dated as of April 10, 2020, by and among the investors listed in Exhibit A attached hereto (the “**Investors**”) and Alnylam Pharmaceuticals, Inc. (the “**Company**”).

WHEREAS, pursuant to the terms and subject to the conditions set forth in this Agreement, the Company desires to issue and sell to the Investors, and the Investors desire to subscribe for and purchase from the Company, certain shares of common stock, par value \$0.01 per share, of the Company (the “**Common Stock**”).

NOW, THEREFORE, in consideration of the following mutual promises and obligations, and for good and valuable consideration, the adequacy and sufficiency of which are hereby acknowledged, the Investors and the Company agree as follows:

1. Definitions.

1.1 Defined Terms. When used in this Agreement, the following terms shall have the respective meanings specified therefor below:

“**Affiliate**” shall mean, with respect to any designated Person, any other Person that, directly or indirectly, controls, is controlled by or is under common control with such designated Person. For purposes of this definition, “control” of a Person means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of voting securities, by contract or otherwise, and the terms “controlled” and “controlling” have meanings correlative to the foregoing. For the purposes of this Agreement, in no event shall any Investor or any of its Affiliates be deemed Affiliates of the Company or any of its Affiliates, nor shall the Company or any of its Affiliates be deemed Affiliates of any Investor or any of its Affiliates.

“Agreement” shall have the meaning set forth in the Preamble, including all Exhibits attached hereto.

“**Business Day**” shall mean any day that is not a Saturday, Sunday or other day on which commercial banks in New York City are authorized or required by applicable Law to remain closed. For the avoidance of doubt, with respect to any notice or other communication required to be given 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, shall not prevent a day that would otherwise be a Business Day hereunder from so being a Business Day.

“**Disposition**” or “**Dispose of**” shall mean any (i) offer, pledge, sale, contract to sell, sale of any option or contract to purchase, purchase of any option or contract to sell, grant of any option, right or warrant for the sale of, or other disposition of or transfer of any Lock-Up Securities, including, without limitation, any “short sale” or similar arrangement, or (ii) swap or any other agreement or any transaction that transfers, in whole or in part, directly or indirectly, the economic consequence of ownership of Lock-Up Securities, whether any such swap or transaction is to be settled by delivery of securities, in cash or otherwise.

“Effect” shall have the meaning set forth in the definition of “Material Adverse Effect.”

“**Governmental Authority**” shall mean any court, agency, authority, department, regulatory authority or other instrumentality of any government or country or of any national, federal, state, provincial, regional, county, city or other political subdivision of any such government or country or any supranational organization of which any such country is a member.

“**Intellectual Property**” shall mean trademarks, trade names, trade dress, service marks, copyrights, and similar rights (including registrations and applications to register or renew the registration of any of the foregoing), patents and patent applications, trade secrets, and any other similar intellectual property rights.

“**Intellectual Property License**” shall mean any license, permit, authorization, approval, contract or consent granted, issued by or with any Person relating to the use of Intellectual Property.

“**Law**” or “**Laws**” shall mean, with respect to any Person, all laws, statutes, rules, regulations, orders, judgments, injunctions and/or ordinances of any Governmental Authority applicable to such Person or any of its properties or assets.

“**Material Adverse Effect**” shall mean any change, event or occurrence (each, an “**Effect**”) that, individually or when taken together with all other Effects, has (i) a material adverse effect on the business, financial condition, assets, results of operations or prospects of the Company and its Subsidiaries, taken as a whole, or (ii) a material adverse effect on the Company’s ability to perform its obligations, or consummate the Transaction, in accordance with the terms of this Agreement, except in the case of (i) or (ii) to the extent that any such Effect results from or arises out of: (A) changes in conditions in the United States or global economy or capital or financial markets generally, including any disruption thereof and any decline in the price of any security or any market index, (B) changes in general legal, regulatory, political, economic or business conditions or changes in generally accepted accounting principles in the United States or interpretations thereof that, in each case, generally affect the biotechnology or biopharmaceutical industries, (C) any change in the trading prices or trading volume of the Common Stock (it being understood that the facts giving rise to or contributing to any such change may be deemed to constitute, or be taken into account when determining whether there has been or will be, a Material Adverse Effect, except to the extent any of such facts is an Effect referred to in clauses (A), (B) or (D) through (G) of this definition), (D) acts of war, sabotage or terrorism, or any escalation or worsening of any such acts of war, sabotage or terrorism, (E) earthquakes, hurricanes, floods or other natural disasters, (F) the outbreak of contagious disease, epidemic or pandemic (including COVID-19), any quarantine, shelter-in-place or similar or related directive, policy or guidance or other action by any Governmental Authority, or (G) any action taken by the Company required by this Agreement; provided that, with respect to clauses (A), (B), (D), (E) and (F), such Effect does not have a material disproportionate and adverse impact on the Company relative to other companies in the biotechnology or biopharmaceutical industries.

“Organizational Documents” shall mean (i) the Restated Certificate of Incorporation of the Company dated as of April 25, 2019, as amended through the date of this Agreement and (ii) **the Amended and Restated Bylaws of the Company effective as of April 25, 2019, as amended through the date of this Agreement.**

“Permitted Transferee” shall mean an Affiliate of an Investor; provided, however, that no such Affiliate shall be deemed a Permitted Transferee for any purpose under this Agreement unless (i) the Permitted Transferee, prior to or simultaneously with such transfer or assignment, shall have agreed in writing with the Company to be subject to and bound by all restrictions and obligations applicable to such Investor set forth in this Agreement, and (ii) such Investor shall, within five (5) days prior to such transfer, furnish to the Company written notice of the name and address of such Permitted Transferee, details of its status as a Permitted Transferee and details of the Registrable Securities with respect to which such registration rights are being assigned. Following such transfer, the Permitted Transferee shall be deemed to be an Investor for all purposes under this Agreement.

“Person” shall mean any individual, partnership, limited liability company, firm, corporation, trust, unincorporated organization, government or any department or agency thereof or other entity, as well as any syndicate or group that would be deemed to be a Person under Section 13(d)(3) of the Exchange Act.

“Registrable Securities” shall mean (i) the Shares, together with any shares of Common Stock issued in respect thereof as a result of any stock split, stock dividend, share exchange, merger, consolidation or similar recapitalization and (ii) any Common Stock issued as (or issuable upon the exercise of any warrant, right or other security that is issued as) a dividend or other distribution with respect to, or in exchange or in replacement of, the shares of Common Stock described in clause (i) of this definition, excluding in all cases, however, (A) any Registrable Securities sold to or through a broker or dealer or underwriter in a public distribution or a public securities transaction or (B) Registrable Securities eligible for resale pursuant to Rule 144(b)(1)(i) under the Securities Act without the requirement for the Company to be in compliance with the current public information required under Rule 144(c)(1) under the Securities Act as to such Shares.

“Registration Statement” shall mean any registration statement of the Company under the Securities Act that covers any of the Registrable Securities pursuant to the provisions of this Agreement, including the related prospectus, all amendments and supplements to such registration statement (including post-effective amendments), and all exhibits and all materials incorporated by reference or explicitly deemed to be incorporated by reference in such registration statement.

“Third Party” shall mean any Person (other than a Governmental Authority) other than any Investor, the Company or any Affiliate of an Investor or the Company.

“Transaction” shall mean the issuance and sale of the Shares by the Company, and the purchase of the Shares by the Investors, in accordance with the terms hereof.

“Underwritten Offering” shall mean a registration in which shares of Common Stock are sold to an underwriter for reoffering to the public.

1.2 Additional Defined Terms. In addition to the terms defined in Section 1.1, the following terms shall have the respective meanings assigned thereto in the sections indicated below:

<u>Defined Term</u>	<u>Section</u>
Closing	Section 3.1
Common Stock	Recitals
Company	Preamble
Company SEC Documents	Section 4.11(a)
Exchange Act	Section 4.11(a)
Investor	Preamble
Lock-Up Securities	Section 9.1
Lock-Up Term	Section 9.1
Modified Clause	Section 10.7
Permits	Section 4.10
Registration Notice	Section 9.2(b)
Required Period	Section 9.2(e)
Required Registration	Section 9.2(a)
SEC	Section 4.7
Securities Act	Section 4.11(a)
Shares	Section 2.1
Subsidiaries	Section 4.3
Violation	Section 9.2(i)(i)

2. Purchase and Sale of Common Stock.

2.1 Purchase and Sale. Subject to the terms and conditions of this Agreement, at the Closing, the Company shall issue and sell to each Investor, free and clear of all liens, other than any liens arising as a result of any action by any Investor, and each Investor shall purchase from the Company, the number of shares of Common Stock set forth opposite such Investor's name on Exhibit A for a purchase price of \$103.79¹ per share. The shares of Common Stock issued to the Investors pursuant to this Agreement shall be referred to in this Agreement as the "**Shares**."

¹ Equals 100% of the 30 calendar-day volume weighted average closing price for the Common Stock ending on and including the last trading day prior to the execution of this Agreement, as observed on a Bloomberg Terminal.

2.2 Tax Treatment. For U.S. federal income and other applicable tax purposes, the Investors and the Company agree to treat the Transaction as separate and independent from any transactions entered into by the Company and any of the Investors or their Affiliates, other than those contemplated by this Agreement, and to report the transactions contemplated by this Agreement on U.S. federal income tax and other applicable tax returns in accordance with this Section 2.2 unless otherwise required by applicable Law.

3. Closing; Deliveries.

3.1 Closing. Subject to the satisfaction or waiver of all the conditions to the Closing set forth in Sections 6, 7 and 8 hereof, the closing of the purchase and sale of the Shares hereunder (the "Closing") shall be held at 10:00 a.m. Boston time on the date hereof, at the offices of Goodwin Procter LLP, 100 Northern Avenue, Boston, Massachusetts 02210, or at such other time, date and location as the parties may agree in writing.

3.2 Deliveries.

(a) Deliveries by the Company. At the Closing, the Company shall instruct its transfer agent to register the Shares in book-entry in the name of each Investor and in the amounts set forth on Exhibit A. The Company shall also deliver at the Closing: (i) a certificate in form and substance reasonably satisfactory to each Investor and duly executed on behalf of the Company by an authorized executive officer of the Company, certifying that the conditions to Closing set forth in Sections 6 and 8.3(b) of this Agreement have been fulfilled; (ii) a certificate of the secretary of the Company dated as of the date hereof certifying (A) that attached thereto is a true and complete copy of the Amended and Restated Bylaws of the Company as in effect on the date hereof; (B) that attached thereto is a true and complete copy of all resolutions adopted by the Board of Directors of the Company authorizing the execution, delivery and performance of this Agreement and the Transaction and that all such resolutions are in full force and effect, have not been amended and are all the resolutions adopted in connection with the transactions contemplated hereby as of the date hereof; and (C) that attached thereto is a true and complete copy of the Company's Restated Certificate of Incorporation as in effect on the date hereof; and (iii) a legal opinion of Goodwin Procter LLP, counsel to the Company, in form and substance reasonably acceptable to the Investors.

(b) Deliveries by the Investors. At the Closing, each Investor shall deliver to the Company the aggregate purchase price set forth opposite such Investor's name on Exhibit A by wire transfer of immediately available United States funds to an account designated by the Company. Each Investor shall also deliver, or cause to be delivered, at the Closing, a certificate in form and substance reasonably satisfactory to the Company duly executed by an authorized signatory of such Investor certifying that the conditions to Closing set forth in Section 7 of this Agreement have been fulfilled.

4. Representations and Warranties of the Company. The Company hereby represents and warrants to each Investor that:

4.1 Organization, Good Standing and Qualification.

(a) Each of the Company and the Subsidiaries (as defined below) is a corporation duly organized, validly existing and in good standing under the laws of the jurisdiction of its organization, with the requisite power and authority to own and use its properties and assets and to carry on its business as currently conducted. Each of the Company and the Subsidiaries has all requisite corporate power and corporate authority to own, lease and operate its properties and assets, to carry on its business as now conducted, and as proposed to be conducted as described in the Company SEC Documents, and the Company has all requisite corporate power to enter into this Agreement to issue and sell the Shares and to perform its obligations under and to carry out the other transactions contemplated by this Agreement.

(b) Each of the Company and its Subsidiaries is qualified to transact business and is in good standing in each jurisdiction in which the character of the properties owned, leased or operated by the Company or Subsidiary, as applicable, or the nature of the business conducted by the Company or Subsidiary, as applicable, makes such qualification necessary, except where the failure to be so qualified would not have a Material Adverse Effect.

4.2 Capitalization and Voting Rights.

(a) The authorized capital of the Company as of the date hereof consists of: (i) 250,000,000 shares of Common Stock of which, as of April 9, 2020, 113,382,204 shares are issued and outstanding and (ii) 5,000,000 shares of preferred stock, par value \$0.01 per share, none of which are issued and outstanding as of the date of this Agreement. All of the issued and outstanding shares of Common Stock (A) have been duly authorized and validly issued, (B) are fully paid and non-assessable, and (C) were issued in compliance with all applicable federal and state securities Laws.

(b) All of the authorized shares of Common Stock are entitled to one (1) vote per share.

(c) Except as described or referred to in Section 4.2(a) above, and as set forth in the Company SEC Documents, as of the date hereof, there are not: (i) any outstanding equity securities, options, warrants, rights (including conversion or preemptive rights) or other agreements pursuant to which the Company is or may become obligated to issue, sell or repurchase any shares of its capital stock or any other securities of the Company or (ii) any restrictions on the transfer of capital stock of the Company other than pursuant to state and federal securities Laws.

(d) Except as set forth in the Company SEC Documents, the Company is not a party to or subject to any agreement or understanding relating to the voting of shares of capital stock of the Company or the giving of written consents by a stockholder or director of the Company.

4.3 Subsidiaries. The Company has disclosed all of its subsidiaries required to be disclosed pursuant to Item 601(b)(21) of Regulation S-K in an exhibit to its Annual Report on Form 10-K (the “Subsidiaries”). The Company owns, directly or indirectly, all of the capital stock or other equity interests of each Subsidiary free and clear of any liens, and all of the issued and outstanding shares of capital stock of each Subsidiary are validly issued and are fully paid, non-assessable and free of preemptive and similar rights to subscribe for or purchase securities.

4.4 Authorization.

(a) All requisite corporate action on the part of the Company, its directors and stockholders required by applicable Law for the authorization, execution and delivery by the Company of this Agreement and the performance of all obligations of the Company hereunder, including the authorization, issuance and delivery of the Shares, has been taken.

(b) This Agreement has been duly executed and delivered by the Company, and upon the due execution and delivery of this Agreement by the Investors, this Agreement will constitute a valid and legally binding obligation of the Company, enforceable against the Company in accordance with its terms (except as such enforceability may be limited by (i) applicable bankruptcy, insolvency, reorganization, moratorium or other Laws of general application relating to or affecting enforcement of creditors’ rights and (ii) rules of Law governing specific performance, injunctive relief or other equitable remedies and limitations of public policy).

(c) No stop order or suspension of trading of the Common Stock has been implemented by The Nasdaq Stock Market LLC, the SEC or any other Governmental Authority and remains in effect.

4.5 No Defaults. The Company is not in default under or in violation of (a) the Organizational Documents, (b) any provision of applicable Law or any ruling, writ, injunction, order, Permit, judgment or decree of any Governmental Authority or (c) any agreement, arrangement or instrument, whether written or oral, by which the Company or any of its assets are bound, except, in the case of subsections (b) and (c), as would not have a Material Adverse Effect. There exists no condition, event or act which after notice, lapse of time, or both, would constitute a default or violation by the Company under any of the foregoing, except, in the case of subsections (b) and (c), as would not have a Material Adverse Effect.

4.6 No Conflicts. The execution, delivery and performance of this Agreement and compliance with the provisions hereof by the Company do not and shall not: (a) violate any provision of applicable Law or any ruling, writ, injunction, order, permit, judgment or decree of any Governmental Authority, (b) constitute a breach of, or default under (or an event which, with notice or lapse of time or both, would become a default under) or conflict with, or give rise to any right of termination, cancellation or acceleration of, any agreement, arrangement or instrument, whether written or oral, by which the Company or any of its assets are bound, (c) violate or conflict with any of the provisions of the Organizational Documents or (d) result in any encumbrance upon any of the Shares, other than restrictions pursuant to this Agreement or securities Laws, or any of the properties or assets of the Company or any Subsidiary, except, in the case of subsections (a) and (b), as would not have a Material Adverse Effect.

4.7 No Governmental Authority or Third-Party Consents. No consent, approval, authorization or other order of, or filing with, or notice to, any Governmental Authority or other Third Party is required to be obtained or made by the Company in connection with the authorization, execution and delivery by the Company of this Agreement or with the authorization, issuance and sale by the Company of the Shares, except such filings as may be required to be made with the Securities and Exchange Commission (the “SEC”) and with any state blue sky or securities regulatory authority, which filings shall be made in a timely manner in accordance with all applicable Laws.

4.8 Valid Issuance of Shares. When issued, sold and delivered at the Closing in accordance with the terms hereof, the Shares shall be duly authorized, validly issued, fully paid and nonassessable, free from any liens, encumbrances or restrictions on transfer, including preemptive rights, rights of first refusal or other similar rights, other than as arising pursuant to this Agreement, as a result of any action by any Investor or under federal or state securities Laws.

4.9 Litigation. Except as set forth in the Company SEC Documents filed prior to the date of this Agreement, there is no action, suit, proceeding or investigation pending (of which the Company has received notice or otherwise has knowledge) or, to the Company’s knowledge, threatened, against the Company or which the Company intends to initiate which has had or is reasonably likely to have a Material Adverse Effect.

4.10 Licenses and Other Rights; Compliance with Laws. The Company has all franchises, permits, licenses and other rights and privileges (“Permits”) necessary to permit it to own its properties and to conduct its business as presently conducted and is in compliance thereunder, except where the failure to be in compliance does not and would not have a Material Adverse Effect. The Company has not taken any action that would interfere with the Company’s ability to renew all such Permit(s), except where the failure to renew such Permit(s) would not have a Material Adverse Effect. The Company is and has been in compliance with all Laws applicable to its business, properties and assets, and to the products and services sold by it, except where the failure to be in compliance does not and would not have a Material Adverse Effect.

4.11 Company SEC Documents; Financial Statements; Nasdaq Stock Market.

(a) Since December 31, 2017, the Company has timely filed all required reports, schedules, forms, statements and other documents (including exhibits and all other information incorporated therein), and any required amendments to any of the foregoing, with the SEC (the “Company SEC Documents”). As of their respective filing dates, each of the Company SEC Documents complied in all material respects with the requirements of the Securities Act of 1933, as amended (the “Securities Act”), and the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and the rules and regulations of the SEC promulgated thereunder applicable to such Company SEC Documents, and no Company SEC Documents when filed, declared effective or mailed, as applicable, contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading.

(b) The financial statements of the Company included in its Annual Report on Form 10-K for the fiscal year ended December 31, 2019 comply as to form in all material respects with applicable accounting requirements and the published rules and regulations of the SEC with respect thereto, have been prepared in accordance with United States generally accepted accounting principles applied on a consistent basis during the periods involved (except as may be indicated in the notes thereto) and fairly present in all material respects the financial position of the Company as of the dates thereof and the results of its operations and cash flows for the periods then ended. Except (i) as set forth in the Company SEC Documents or (ii) for liabilities incurred in the ordinary course of business subsequent to the date of the most recent balance sheet contained in the Company SEC Documents, the Company has no liabilities, whether absolute or accrued, contingent or otherwise, other than those that would not, individually or in the aggregate, have a Material Adverse Effect.

(c) As of the date of this Agreement, the Common Stock is listed on The Nasdaq Global Select Market, and the Company has taken no action designed to, or which is likely to have the effect of, terminating the registration of the Common Stock under the Exchange Act or delisting the Common Stock from The Nasdaq Global Select Market. As of the date of this Agreement, the Company has not received any notification that, and has no knowledge that the SEC or The Nasdaq Stock Market LLC is contemplating terminating such listing or registration.

(d) Other than as has been disclosed to the Investors, there are no outstanding or unresolved comments in comment letters received from the SEC or its staff.

4.12 Absence of Certain Changes. Except as disclosed in the Company SEC Documents, since December 31, 2019, there has not occurred any event that has caused or would reasonably be expected to cause a Material Adverse Effect.

4.13 Internal Controls; Disclosure Controls and Procedures. The Company maintains internal control over financial reporting as defined in Rule 13a-15(f) under the Exchange Act. The Company has implemented the “disclosure controls and procedures” (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) required in order for the Principal Executive Officer and Principal Financial Officer of the Company to engage in the review and evaluation process mandated by the Exchange Act, and is in compliance with such disclosure controls and procedures in all material respects. Each of the Principal Executive Officer and the Principal Financial Officer of the Company (or each former Principal Executive Officer of the Company and each former Principal Financial Officer of the Company, as applicable) has made all certifications required by Sections 302 and 906 of the Sarbanes-Oxley Act of 2002 with respect to all reports, schedules, forms, statements and other documents required to be filed by the Company with the SEC.

4.14 Intellectual Property. The Intellectual Property that is owned by the Company is owned free from any liens or restrictions, and all of the Company's material Intellectual Property Licenses are in full force and effect in accordance with their terms and are free of any liens or restrictions except (a) where the failure to be free from such liens or restrictions would not have a Material Adverse Effect or (b) as set forth in any such Intellectual Property License. Except as set forth in the Company SEC Documents, there is no legal claim or demand of any Person pertaining to, or any proceeding which is pending (of which the Company has received notice or otherwise has knowledge) or, to the knowledge of the Company, threatened, (i) challenging the right of the Company in respect of any Company Intellectual Property, or (ii) that claims that any default exists under any Intellectual Property License, except, in the case of (i) and (ii) above, where any such claim, demand or proceeding would not have a Material Adverse Effect.

4.15 Offering. Subject to the accuracy of the Investors' representations set forth in Sections 5.5, 5.6, 5.7, 5.8 and 5.9, the offer, sale and issuance of the Shares to be issued in conformity with the terms of this Agreement constitute transactions which are exempt from the registration requirements of the Securities Act and from all applicable state registration or qualification requirements. Neither the Company nor any Person acting on its behalf will take any action that would cause the loss of such exemption.

4.16 No Integration. The Company has not, directly or through any agent, sold, offered for sale, solicited offers to buy or otherwise negotiated in respect of, any security (as defined in the Securities Act) which is or will be integrated with the Shares sold pursuant to this Agreement in a manner that would require the registration of the Shares under the Securities Act.

4.17 Brokers' or Finders' Fees. No broker, finder, investment banker or other Person is entitled to any brokerage, finder's or other fee or commission from the Company in connection with the transactions contemplated by this Agreement.

4.18 Not Investment Company. The Company is not, and immediately after receipt of the aggregate purchase price for the Shares will not be, an "investment company" as defined in the Investment Company Act of 1940, as amended.

4.19 No General Solicitation. Neither the Company nor any person acting on behalf of the Company has offered or sold any of the Shares by any form of general solicitation or general advertising.

4.20 Foreign Corrupt Practices. Neither the Company, nor to the knowledge of the Company, any agent or other person acting on behalf of the Company, has: (i) directly or indirectly, used any funds for unlawful contributions, gifts, entertainment or other unlawful expenses related to foreign or domestic political activity, (ii) made any unlawful payment to foreign or domestic government officials or employees or to any foreign or domestic political parties or campaigns from corporate funds, (iii) failed to disclose fully any contribution made by the Company (or made by any person acting on its behalf of which the Company is aware) which is in violation of Law or (iv) violated in any material respect any provision of the Foreign Corrupt Practices Act of 1977, as amended, or any applicable non-U.S. anti-bribery Law.

4.21 Regulation M Compliance. The Company has not taken, directly or indirectly, any action designed to cause or to result in the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of any of the Shares.

4.22 Office of Foreign Assets Control. Neither the Company nor, to the Company's knowledge, any director, officer, agent, employee or Affiliate of the Company is currently subject to any U.S. sanctions administered by the Office of Foreign Assets Control of the U.S. Treasury Department.

4.23 U.S. Real Property Holding Corporation. The Company is not and has never been a U.S. real property holding corporation within the meaning of Section 897 of the Internal Revenue Code of 1986, as amended, and the Company shall so certify upon an Investor's request.

5. Representations and Warranties of the Investors. Each Investor hereby represents and warrants to the Company, on behalf of itself, that:

5.1 Organization; Good Standing. The Investor is duly organized or formed, validly existing and in good standing under the laws of the jurisdiction of its organization or formation. The Investor has all requisite power and authority to enter into this Agreement, to purchase the number of shares of Common Stock set forth opposite the Investor's name on Exhibit A and to perform its obligations under and to carry out the other transactions contemplated by this Agreement.

5.2 Authorization. All requisite action on the part of the Investor and its general and limited partners, required by applicable Law for the authorization, execution and delivery by the Investor of this Agreement and the performance of all of its obligations hereunder, including the subscription for and purchase of the number of shares of Common Stock set forth opposite the Investor's name on Exhibit A, has been taken. This Agreement has been, duly executed and delivered by the Investor and upon the due execution and delivery hereof by the Company and each other Investor, will constitute valid and legally binding obligations of the Investor, enforceable against the Investor in accordance with its terms (except as such enforceability may be limited by (a) applicable bankruptcy, insolvency, reorganization, moratorium or other Laws of general application relating to or affecting enforcement of creditors' rights and (b) rules of Law governing specific performance, injunctive relief or other equitable remedies and limitations of public policy).

5.3 No Conflicts. The execution, delivery and performance of this Agreement and compliance with the provisions hereof by the Investor do not and shall not: (a) violate any provision of applicable Law or any ruling, writ, injunction, order, permit, judgment or decree of any Governmental Authority, (b) constitute a breach of, or default under (or an event which, with notice or lapse of time or both, would become a default under) or conflict with, or give rise to any right of termination, cancellation or acceleration of, any agreement, arrangement or instrument, whether written or oral, by which the Investor or any of its assets, are bound, or (c) violate or conflict with any of the provisions of the Investor's organizational documents (including any articles or memoranda of organization or association, charter, bylaws or similar documents), except, in the case of subsections (a) or (b), as would not have a material adverse effect on the ability of the Investor to consummate the Transactions and perform its obligations under this Agreement.

5.4 No Governmental Authority or Third-Party Consents. No consent, approval, authorization or other order of any Governmental Authority or other Third Party is required to be obtained by the Investor in connection with the authorization, execution and delivery of this Agreement or with the subscription for and purchase of the Shares.

5.5 Purchase Entirely for Own Account. The shares of Common Stock purchased by the Investor hereunder shall be acquired for investment for the Investor's own account, not as a nominee or agent, and not with a view to the resale or distribution of any part thereof, and the Investor has no present intention of selling, granting any participation or otherwise distributing such shares. The Investor does not have and will not have as of the Closing any contract, undertaking, agreement or arrangement with any Person to sell, transfer or grant participation to a Person any of the Shares.

5.6 Disclosure of Information. The Investor has received all the information from the Company and its management that the Investor considers necessary for deciding whether to purchase any Shares hereunder. The Investor further represents that it has had an opportunity to ask questions and receive answers from the Company regarding the Company, its financial condition, results of operations and prospects and the terms and conditions of the offering of the Shares sufficient to enable it to evaluate its investment.

5.7 Investment Experience and Accredited Investor Status. The Investor is an "accredited investor" (as defined in Regulation D under the Securities Act). The Investor has such knowledge and experience in financial or business matters that it is capable of evaluating the merits and risks of the investment in the Shares to be purchased by the Investor hereunder.

5.8 Restricted Securities. The Investor understands that the shares of Common Stock to be purchased by the Investor hereunder, when issued, shall be "restricted securities" under the federal securities Laws inasmuch as they are being acquired from the Company in a transaction not involving a public offering and that under such Laws such shares may be resold without registration under the Securities Act only in certain limited circumstances. The Investor represents that it is familiar with Rule 144 of the Securities Act, as presently in effect.

5.9 Legends. The Investor understands that the shares of Common Stock to be purchased hereunder shall be in book-entry form and subject to the following legend:

"These securities have not been registered under the Securities Act of 1933. They may not be sold, offered for sale, pledged or hypothecated in the absence of a registration statement in effect with respect to the securities under the Securities Act or an opinion of counsel (which counsel shall be reasonably satisfactory to Alnylam Pharmaceuticals, Inc.) that such registration is not required or unless sold pursuant to Rule 144 of the Securities Act."

5.10 Financial Assurances. The Investor has access to cash in an amount sufficient to pay to the Company the aggregate purchase price for the number of shares of Common Stock set forth opposite the Investor's name on Exhibit A.

6. Investors' Conditions to Closing. Each Investor's obligation to purchase the shares of Common Stock set forth opposite such Investor's name on Exhibit A at the Closing is subject to the fulfillment as of the Closing of the following conditions (unless waived in writing by such Investor):

6.1 Representations and Warranties. The representations and warranties made by the Company in Section 4 hereof shall be true and correct as of the date of this Agreement, except to the extent such representations and warranties were specifically made as of a particular date, in which case such representations and warranties shall have been true and correct as of such date.

6.2 Covenants. All covenants and agreements contained in this Agreement to be performed or complied with by the Company at or prior to the Closing shall have been performed or complied with in all material respects.

7. Company's Conditions to Closing. The Company's obligation to issue and sell the Shares at the Closing is subject to the fulfillment as of the Closing of the following conditions (unless waived in writing by the Company):

7.1 Representations and Warranties. The representations and warranties made by each Investor in Section 5 hereof shall be true and correct as of the date of this Agreement, except to the extent such representations and warranties were specifically made as of a particular date, in which case such representations and warranties shall have been true and correct as of such date.

7.2 Covenants. All covenants and agreements contained in this Agreement to be performed or complied with by each Investor at or prior to the Closing shall have been performed or complied with in all material respects.

8. Mutual Conditions to Closing. The obligations of the Investors and the Company to consummate the Closing are subject to the fulfillment as of the Closing of the following conditions:

8.1 Injunctions. There shall be no Law or ruling enacted, promulgated, issued, entered, amended or enforced by any Governmental Authority in effect enjoining, restraining, preventing or prohibiting the consummation of the transactions contemplated by this Agreement or making the consummation of the transactions contemplated by this Agreement illegal.

8.2 Absence of Litigation. There shall be no action, suit, proceeding or investigation by a Governmental Authority pending or currently threatened in writing against the Company or the Investors that questions the validity of this Agreement, the right of the Company or the Investors to enter into this Agreement or to consummate the transactions contemplated hereby or thereby or which, if determined adversely, would impose substantial monetary damages on the Company or the Investors as a result of the consummation of the transactions contemplated by this Agreement.

8.3 No Prohibition; Market Listing. (a) No provision of any applicable Law and no decree that prohibits, makes illegal or enjoins the consummation of the Transaction shall be in effect; and (b) the Shares shall be eligible for listing on The Nasdaq Global Select Market.

9. Additional Covenants and Agreements.

9.1 Lock-Up. From and after the Closing and until the date that is ninety (90) days after the date of the Closing (the “**Lock-Up Term**”), without the prior written approval of the Company, no Investor shall Dispose of (x) any of the Shares, together with any shares of capital stock issued in respect thereof as a result of any stock split, stock dividend, share exchange, merger, consolidation or similar recapitalization, and (y) any Common Stock issued as (or issuable upon the exercise of any warrant, right or other security that is issued as) a dividend or other distribution with respect to, or in exchange or in replacement of, the Shares or shares of capital stock described in clause (x) of this sentence (collectively, the “**Lock-Up Securities**”); provided, however, that the foregoing shall not prohibit an Investor from transferring any of the Lock-Up Securities to a Permitted Transferee.

9.2 Registration Rights.

(a) Required Registration. On or prior to the date that is sixty (60) days after the date of the Closing, the Company shall file a Registration Statement under the Securities Act (the “**Required Registration**”) to cover the resale of the Registrable Securities and shall use all reasonable efforts to, as soon as practicable thereafter, effect the registration of the Registrable Securities to permit or facilitate the sale and distribution of the Registrable Securities, subject however, to the conditions and limitations set forth herein.

(b) Company Registration. Effective from the expiration of the Lock-Up Term, the Company shall notify each Investor that holds Registrable Securities in writing at least ten (10) days prior to the filing of any Registration Statement related to an Underwritten Offering including shares of Common Stock by one or more selling stockholders (other than the Investors) (“**Registration Notice**”) and will afford each Investor an opportunity, subject to the terms and conditions of this Agreement, to include in such Registration Statement the number of Registrable Securities then held by such Investor that such Investor wishes to include in such Registration Statement. Each Investor desiring to include in any such Registration Statement all or any part of the Registrable Securities held by such Investor shall, within five (5) days after receipt of the Registration Notice, so notify the Company in writing, and in such notification, inform the Company of the number of Registrable Securities such Investor wishes to include in such Registration Statement. If an Investor decides not to include Registrable Securities in any Registration Statement thereafter filed by the Company, such Investor shall nevertheless continue to have the right to include Registrable Securities in any subsequent Registration Statement or Registration Statements as may be filed by the Company with respect to offerings of its securities, all upon the terms and conditions set forth herein. Each Investor shall keep confidential and not disclose to any Third Party (i) its receipt of any Registration Notice and (ii) any information regarding the proposed offering as to which such notice is delivered, except as required by law, regulation or as compelled by subpoena. The right of any such Investor to include Registrable Securities in a registration statement pursuant to this Section 9.2(b) shall be conditioned upon such Investor’s participation in such underwriting and the inclusion of such

Investor's Registrable Securities in the underwriting to the extent provided herein. The Investors proposing to distribute their Registrable Securities through such underwriting shall enter into an underwriting agreement in customary form with the managing underwriter or underwriters selected for such underwriting. Notwithstanding any other provision of this Section 9.2(b), if the managing underwriter for the Underwritten Offering determines in good faith that marketing factors require a limitation of the number of shares of Registrable Securities to be included in such Underwritten Offering and advises the Investors of such determination in writing, then the managing underwriter may exclude shares (including up to 100% of the Registrable Securities) from the registration and the underwriting, with the number of Registrable Securities, if any, included in the registration and the underwriting being allocated to each of Investors requesting inclusion of their Registrable Securities in such Registration Statement and all other stockholders selling shares of Common Stock pursuant to such Registration Statement on a pro rata basis based on the total number of shares of Common Stock then held by each such Investor or other stockholder. Notwithstanding the foregoing, the Company shall have the right to terminate or withdraw any registration initiated by it under this Section 9.2(b) prior to the effectiveness of such registration whether or not any Investor has elected to include securities in such registration.

(c) Primary Shares in Required Registration. With respect to the Required Registration, the Company may also propose to sell shares of Common Stock on its own behalf.

(d) Revocation of Required Registration. With respect to the Required Registration, each Investor may, at any time prior to the effective date of such Registration Statement, waive the requirement to have all of any of the Registrable Securities owned by such Investor included therein by providing a written notice to the Company, in which case such Registrable Securities will not be included in such Registration Statement.

(e) Continuous Effectiveness of Registration Statement. The Company will use its reasonable efforts to cause the Registration Statement filed pursuant to this Section 9 to be declared effective by the SEC or to become effective under the Securities Act as promptly as practicable and to keep each such Registration Statement that has been declared or becomes effective continuously effective until the earlier of (i) such time as any securities registered pursuant to this Section 9 shall cease to become Registrable Securities and (ii) one (1) year (the "**Required Period**").

(f) Obligations of the Company. The Company shall, as expeditiously as reasonably possible following the Closing:

- (i) prepare and file with the SEC a Registration Statement with respect to the Registrable Securities; provided that at least five (5) Business Days prior to filing the Registration Statement or any prospectus or any amendments or supplements thereto, the Company shall furnish to the Investors and their counsel copies of all such documents proposed to be filed, and the Investors shall have the opportunity to comment on any information that is contained therein and the Company shall consider all such comments in good faith and shall make the corrections reasonably requested by the Investors with respect to any information pertaining solely to the Investors and the plan of distribution prior to filing the Registration Statement or other documents;

- (ii) prepare and file with the SEC such amendments and post-effective amendments to the Registration Statement and any prospectus used in connection therewith as may be necessary to keep the Registration Statement effective for the Required Period, and cause the prospectus to be supplemented by any required prospectus supplement, and as so supplemented to be filed pursuant to Rule 424 under the Securities Act, to comply with the provisions of the Securities Act with respect to the disposition of all Registrable Securities covered by such Registration Statement for the Required Period; provided that at least five (5) Business Days prior to filing any such amendments and post effective amendments or supplements thereto, the Company shall furnish to the Investors and their counsel copies of all such documents proposed to be filed, and the Investors have the opportunity to comment on any information that is contained therein and the Company shall consider all such comments in good faith and make the corrections reasonably requested by the Investors with respect to any information pertaining solely to the Investors and the plan of distribution prior to filing any such documents;
- (iii) furnish to the Investors such numbers of copies of the Registration Statement, each amendment and supplement thereto, the prospectus included in such Registration Statement (including each preliminary prospectus or free writing prospectus) in conformity with the requirements of the Securities Act, and such other documents as they may reasonably request in order to facilitate the disposition of Registrable Securities owned by them;
- (iv) notify the Investors, promptly after the Company shall receive notice thereof, of the time when the Registration Statement becomes or is declared effective or when any amendment or supplement or any prospectus forming a part of such Registration Statement has been filed;
- (v) notify the Investors promptly of any request by the SEC for the amending or supplementing of the Registration Statement or prospectus or for additional information and promptly deliver to the Investors copies of any comments received from the SEC;
- (vi) notify the Investors promptly of any stop order suspending the effectiveness of the Registration Statement or Prospectus or the initiation of any proceedings for that purpose, and use all reasonable efforts to obtain the withdrawal of any such order or the termination of such proceedings;

- (vii) use all reasonable efforts to register and qualify the Registrable Securities covered by the Registration Statement under such other securities or blue sky Laws of such jurisdictions as shall be reasonably requested by the Investors, use all reasonable efforts to keep each such registration or qualification effective, including through new filings, or amendments or renewals, during the Required Period, and notify the Investors of the receipt of any written notification with respect to any suspension of any such qualification; provided, however, that the Company shall not be required in connection therewith or as a condition thereto to qualify to do business or to file a general consent to service of process in any such states or jurisdictions, except as may be required by the Securities Act;
- (viii) promptly notify the Investors at any time when a prospectus relating thereto is required to be delivered under the Securities Act of the happening of any event as a result of which the prospectus included in the Registration Statement or any offering memorandum or other offering document includes an untrue statement of a material fact or omits to state any material fact required to be stated therein or necessary to make the statements therein not misleading in the light of the circumstances then existing, and promptly prepare a supplement or amendment to such prospectus or file any other required document so that, as thereafter delivered to the purchasers of such Registrable Securities, such prospectus will not contain an untrue statement of material fact or omit to state any fact necessary to make the statements therein not misleading;
- (ix) use all reasonable efforts to comply with all applicable rules and regulations of the SEC relating to such registration and make generally available to its security holders earning statements satisfying the provisions of Section 11(a) of the Securities Act, provided that the Company will be deemed to have complied with this Section 9.2(f)(ix) with respect to such earning statements if it has satisfied the provisions of Rule 158 promulgated under the Securities Act;
- (x) if requested by the Investors, promptly incorporate in a prospectus supplement or post-effective amendment such information as the Investors reasonably request to be included therein, with respect to the Registrable Securities being sold by the Investors, and promptly make all required filings of such prospectus supplement or post-effective amendment; and

- (xi) cause the Registrable Securities covered by such Registration Statement to be listed on each securities exchange, if any, on which equity securities issued by the Company are then listed.

(g) Information; Investor Covenants. It shall be a condition precedent to the obligations of the Company to take any action pursuant to this Section 9 with respect to the Registrable Securities that the Investors furnish to the Company such information regarding itself and the Registrable Securities held by it as is required by Regulation S-K Item 507 or as shall be necessary to effect the registration of the Investor's Registrable Securities. Each Investor agrees that, upon receipt of any notice from the Company of the happening of an event pursuant to Section 9.2(f)(viii) hereof, such Investor will immediately discontinue disposition of Registrable Securities pursuant to any Registration Statement covering such Registrable Securities, until the Investors are advised by the Company that such dispositions may again be made. Each Investor covenants and agrees that it will comply with the prospectus delivery requirements of the Securities Act as applicable to it or an exemption therefrom in connection with sales of Registrable Securities pursuant to any Registration Statement.

(h) Expenses. The Company will pay all expenses associated with the preparation and filing of a Registration Statement, including, without limitation, filing fees, the Company's counsel and accounting fees and expenses, costs associated with clearing the Registrable Securities for sale under applicable state securities laws and listing fees. In no event shall the Company be responsible for any discounts, commissions, fees of underwriters, selling brokers, dealer managers or similar securities industry professionals with respect to the Registrable Securities being sold.

(i) Indemnification. In the event any Registrable Securities are included in a Registration Statement under this Agreement:

- (i) The Company shall indemnify and hold harmless each Investor including Registrable Securities in any such Registration Statement, any underwriter (as defined in the Securities Act) for such Investor and each Person, if any, who controls such Investor or underwriter within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act and the officers, directors, owners, agents and employees of such controlling Persons, against any and all losses, claims, damages or liabilities (joint or several) to which they may become subject under any securities Laws including, without limitation, the Securities Act, the Exchange Act, or any other statute or common law of the United States or any other country or political subdivision thereof, or otherwise, including the amount paid in settlement of any litigation commenced or threatened (including any amounts paid pursuant to or in settlement of claims made under the indemnification or contribution provisions of any underwriting or similar agreement entered into by such Investor in connection with any offering or sale of securities covered by this Agreement), and shall promptly reimburse them, as and when incurred, for any legal or other

expenses incurred by them in connection with investigating any claims and defending any actions, insofar as any such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon any of the following statements, omissions or violations (each, a “**Violation**”): (i) any untrue statement or alleged untrue statement of a material fact contained in or incorporated by reference into such Registration Statement, including any preliminary prospectus or final prospectus contained therein or any free writing prospectus or any amendments or supplements thereto, or in any offering memorandum or other offering document relating to the offering and sale of such securities, (ii) the omission or alleged omission to state therein a material fact required to be stated therein, or necessary to make the statements therein not misleading or (iii) any violation or alleged violation by the Company (or any of its agents or Affiliates) of the Securities Act, the Exchange Act, any state securities Law, or any rule or regulation promulgated under any state securities Law, in each case arising from such Registration Statement; provided, however, the Company shall not be liable in any such case for any such loss, claim, damage, liability or action to the extent that it (A) arises out of or is based upon a Violation which occurs solely in reliance upon and in conformity with written information furnished expressly for use in connection with such registration by such Investor; or (B) is caused by such Investor’s disposition of Registrable Securities after notice from the Company pursuant to Section 9.2(f)(vi) during any period during which such Investor is obligated to discontinue any disposition of Registrable Securities as a result of any stop order suspending the effectiveness of any Registration Statement or prospectus with respect to Registrable Securities. The Company shall pay, as incurred, any legal or other expenses reasonably incurred by any Person intended to be indemnified pursuant to this Section 9.2(i)(i), in connection with investigating or defending any such loss, claim, damage, liability or action; provided, however, that the indemnity agreement contained in this Section 9.2(i)(i) shall not apply to amounts paid in settlement of any such loss, claim, damage, liability or action if such settlement is effected without consent of the Company, which consent shall not be unreasonably withheld, conditioned or delayed.

- (ii) Each Investor including Registrable Securities in a Registration Statement shall indemnify and hold harmless the Company, each of its directors, each of its officers who has signed the Registration Statement, each Person, if any, who controls the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act and the officers, directors, owners, agents and employees of such controlling Persons, any underwriter, any other

Investor selling securities in such Registration Statement and any controlling Person of any such underwriter or other Investor, against any losses, claims, damages or liabilities (joint or several) to which any of the foregoing Persons may become subject, under liabilities (or actions in respect thereto) which arise out of or are based upon any Violation, in each case to the extent (and only to the extent) that such Violation: (i) arises out of or is based upon a Violation which occurs solely in reliance upon and in conformity with written information furnished expressly for use in connection with such registration by such Investor; or (ii) is caused by such Investor's disposition of Registrable Securities after notice from the Company pursuant to Section 9.2(f)(vi) during any period during which such Investor is obligated to discontinue any disposition of Registrable Securities as a result of any stop order suspending the effectiveness of any Registration Statement or prospectus with respect to Registrable Securities. Each such Investor shall pay, as incurred, any legal or other expenses reasonably incurred by any Person intended to be indemnified pursuant to this Section 9.2(i)(ii), in connection with investigating or defending any such loss, claim, damage, liability or action; provided, however, that the indemnity agreement contained in this Section 9.2(i)(ii) shall not apply to amounts paid in settlement of any such loss, claim, damage, liability or action if such settlement is effected without consent of each such Investor, which consent shall not be unreasonably withheld.

- (iii) Promptly after receipt by an indemnified party under this Section 9.2(i) of notice of the commencement of any action (including any action by a Governmental Authority), such indemnified party shall, if a claim in respect thereof is to be made against any indemnifying party under this Section 9.2(i), deliver to the indemnifying party a written notice of the commencement thereof and the indemnifying party shall have the right to participate in, and, to the extent the indemnifying party so desires, jointly with any other indemnifying party similarly noticed, to assume the defense thereof with counsel mutually satisfactory to the parties; provided, however, that an indemnified party shall have the right to retain its own counsel, with the reasonable fees and expenses to be paid by the indemnifying party, if representation of such indemnified party by the counsel retained by the indemnifying party would be inappropriate due to actual or potential differing interests between such indemnified party and any other party represented by such counsel in such proceeding. The failure to deliver written notice to the indemnifying party within a reasonable time of the commencement of any such action, if prejudicial in a material respect to its ability to defend such action, shall relieve such indemnifying party of any liability to the indemnified party under this Section 9.2(i), but the omission so to deliver written notice to the indemnifying party shall not relieve it of any liability that it may have to any indemnified party otherwise than under this Section 9.2(i).

- (iv) In order to provide for just and equitable contribution to joint liability in any case in which a claim for indemnification is made pursuant to this Section 9.2(i) but it is judicially determined (by the entry of a final judgment or decree by a court of competent jurisdiction and the expiration of time to appeal or the denial of the last right of appeal) that such indemnification may not be enforced in such case notwithstanding the fact that this Section 9.2(i) provided for indemnification in such case, the Company and each Investor including Registrable Securities in a Registration Statement shall contribute to the aggregate losses, claims, damages or liabilities to which they may be subject (after contribution from others) in proportion to the relative fault of the Company, on the one hand, and such Investor, severally, on the other hand; provided, however, that in any such case, no Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation; provided further, however, that in no event shall any contribution under this Section 9.2(i)(iv) on the part of any Investor exceed the net proceeds received by such Investor from the sale of Registrable Securities giving rise to such contribution obligation, except in the case of willful misconduct or fraud by such Investor.
- (v) The obligations of the Company and the Investors under this Section 9.2(i) shall survive the completion of any offering of Registrable Securities in a Registration Statement under this Agreement and otherwise.

(j) SEC Reports. With a view to making available to the Investors the benefits of Rule 144 under the Securities Act and any other rule or regulation of the SEC that may at any time permit the Investors to sell Registrable Securities of the Company to the public without registration, the Company agrees to at any time that it is a reporting company under Section 13 or 15(d) of the Exchange Act:

- (i) file with the SEC in a timely manner all reports and other documents required of the Company under the Exchange Act; and
- (ii) furnish to each Investor, so long as such Investor owns any Registrable Securities, forthwith upon request (i) a written statement by the Company that it has complied with the reporting requirements of the Exchange Act, (ii) a copy of the most recent annual or quarterly report of the Company and such other reports

and documents so filed by the Company, and (iii) such other information as may be reasonably requested in availing the Investor of any rule or regulation of the SEC (exclusive of Rule 144A) which permits the selling of any Registrable Securities without registration.

(k) Assignment of Registration Rights. The rights to cause the Company to register any Registrable Securities pursuant to this Agreement shall automatically be assigned in whole or in part (but only with all restrictions and obligations set forth in this Agreement) by an Investor to a Permitted Transferee which acquires Registrable Securities from such Investor.

9.3 Legend Removal. After the expiration of the Lock-Up Term, the Company shall cause the legends set forth in Section 5.10 to be removed from the shares of Common Stock held by an Investor, no later than two (2) Business Days from receipt of a written request from such Investor pursuant to this Section 9.3, if (i) such shares have been resold under an effective Registration Statement, (ii) such shares have been or will be transferred in compliance with Rule 144 under the Securities Act, (iii) such shares are eligible for resale pursuant to Rule 144(b)(1)(i) under the Securities Act without the requirement for the Company to be in compliance with the current public information required under Rule 144(c)(1) under the Securities Act as to such Shares and without volume or manner-of-sale restrictions or (iv) such Investor shall have provided the Company with an opinion of counsel, reasonably satisfactory to the Company, stating that such securities may lawfully be transferred without registration under the Securities Act.

10. Miscellaneous.

10.1 Governing Law; Submission to Jurisdiction.

(a) Governing Law. THIS AGREEMENT SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE INTERNAL SUBSTANTIVE LAWS OF THE STATE OF NEW YORK WITHOUT REFERENCE TO THE RULES THEREOF RELATING TO CONFLICTS OF LAW OTHER THAN SECTION 5-1401 OF THE GENERAL OBLIGATIONS LAW OF THE STATE OF NEW YORK, AND THE OBLIGATIONS, RIGHTS AND REMEDIES OF THE PARTIES HEREUNDER SHALL BE DETERMINED IN ACCORDANCE WITH SUCH LAWS.

(b) Jurisdiction. Each of the parties hereto hereby irrevocably and unconditionally submits, for itself and its property, to the non-exclusive jurisdiction of the Supreme Court of the State of New York sitting in New York County and of the United States District Court of the Southern District of New York, and any appellate court from any thereof, in any action or proceeding arising out of, relating to or in connection with this Agreement, or for recognition or enforcement of any judgment, and each of the parties hereto hereby irrevocably and unconditionally agrees that all claims in respect of any such action or proceeding may be heard and determined in such New York State court or, to the extent permitted by applicable Law, in such federal court. Each of the parties hereto agrees that a final judgment in any such action or proceeding shall be conclusive and may be enforced in other jurisdictions by suit on the

judgment or in any other manner provided by applicable Law. Each of the parties hereto hereby irrevocably and unconditionally waives, to the fullest extent it may legally and effectively do so, any objection that it may now or hereafter have to the laying of venue of any suit, action or proceeding arising out of or relating to this Agreement in any court referred to in this Section 10.1(b). Each of the parties hereto hereby irrevocably waives, to the fullest extent permitted by applicable Law, the defense of an inconvenient forum to the maintenance of such action or proceeding in any such court.

(c) Service of Process. Each of the parties hereto irrevocably consents to service of process in the manner provided for notices in Section 10.3. Nothing in this Agreement will affect the right of any party hereto to serve process in any other manner permitted by applicable Law. Each of the parties hereto waives personal service of any summons, complaint or other process, which may be made by any other means permitted by New York law.

(d) Waiver of Jury Trial. EACH PARTY HERETO HEREBY 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 PURCHASE AND SALE AGREEMENT, OR THE TRANSACTIONS CONTEMPLATED HEREBY (WHETHER BASED ON CONTRACT, TORT OR ANY OTHER THEORY). EACH PARTY HERETO (I) CERTIFIES THAT NO REPRESENTATIVE, AGENT OR ATTORNEY OF THE OTHER PARTY HERETO HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT THE OTHER PARTY HERETO WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE THE FOREGOING WAIVER AND (II) ACKNOWLEDGES THAT IT AND THE OTHER PARTY HERETO HAVE BEEN INDUCED TO ENTER INTO THIS PURCHASE AND SALE AGREEMENT BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS AND CERTIFICATIONS IN THIS SECTION 10.1(d).

10.2 Waiver. Waiver by a party of a breach hereunder by any other party shall not be construed as a waiver of any subsequent breach of the same or any other provision. No delay or omission by a party in exercising or availing itself of any right, power or privilege hereunder shall preclude the later exercise of any such right, power or privilege by such party. No waiver shall be effective unless made in writing with specific reference to the relevant provision(s) of this Agreement and signed by a duly authorized representative of the party granting the waiver.

10.3 Notices. All notices, instructions and other communications hereunder or in connection herewith shall be in writing, shall be sent to the address of the relevant party set forth on Exhibit B attached hereto and be effective (a) upon receipt when sent through the mails, registered or certified mail, return receipt requested, postage prepaid, with such receipt to be effective the date of delivery indicated on the return receipt, (b) upon receipt when sent by an overnight courier, (c) on the date personally delivered to an authorized officer of the party to which sent or (d) on the date transmitted by electronic mail with a confirmation of receipt, in all cases, with a copy emailed to the recipient at the applicable address. Any party may change its address by giving notice to the other parties in the manner provided above.

10.4 Entire Agreement. This Agreement contains the entire agreement among the parties with respect to the subject matter hereof and supersedes all prior and contemporaneous arrangements or understandings, whether written or oral, with respect hereto and thereto.

10.5 Amendments. No provision in this Agreement shall be supplemented, deleted or amended except in a writing executed by an authorized representative of each of the Investors and the Company.

10.6 Headings; Nouns and Pronouns; Section References. Headings in this Agreement are for convenience of reference only and shall not be considered in construing this Agreement. Whenever the context may require, any pronouns used herein shall include the corresponding masculine, feminine or neuter forms, and the singular form of names and pronouns shall include the plural and vice-versa. References in this Agreement to a section or subsection shall be deemed to refer to a section or subsection of this Agreement unless otherwise expressly stated.

10.7 Severability. If, under applicable Laws, any provision hereof is invalid or unenforceable, or otherwise directly or indirectly affects the validity of any other material provision(s) of this Agreement in any jurisdiction ("**Modified Clause**"), then, it is mutually agreed that this Agreement shall endure and that the Modified Clause shall be enforced in such jurisdiction to the maximum extent permitted under applicable Laws in such jurisdiction; provided that the parties shall consult and use all reasonable efforts to agree upon, and hereby consent to, any valid and enforceable modification of this Agreement as may be necessary to avoid any unjust enrichment of another party and to match the intent of this Agreement as closely as possible, including the economic benefits and rights contemplated herein.

10.8 Assignment. Neither this Agreement nor any of the rights or obligations hereunder may be assigned by either the Investors or the Company without (a) the prior written consent of the Company in the case of any assignment by an Investor, except as provided in Section 9.2(k) with respect to an Investor's assignment to a Permitted Transferee, or (b) the prior written consent of the Investors in the case of an assignment by the Company.

10.9 Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective successors and permitted assigns.

10.10 Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original but which together shall constitute one and the same instrument.

10.11 Third Party Beneficiaries. None of the provisions of this Agreement shall be for the benefit of or enforceable by any Third Party, including any creditor of any party hereto, except with respect to a Permitted Transferee. No Third Party (other than a Permitted Transferee) shall obtain any right under any provision of this Agreement or shall by reason of any such provision make any claim in respect of any debt, liability or obligation (or otherwise) against any party hereto.

10.12 No Strict Construction. This Agreement has been prepared jointly and will not be construed against either party.

10.13 Survival of Warranties. The representations and warranties of the Company and the Investors contained in this Agreement shall survive the Closing for eighteen (18) months, except for the representations and warranties set forth in Sections 4.1, 4.2, 4.4, 4.5(a), 4.6(c), 4.8, 4.15, 4.16, 4.17, 5.1, 5.2, 5.5, 5.7, 5.8 and 5.9, which shall survive the Closing. The parties hereby acknowledge and agree that the rights of the parties hereunder are special, unique and of extraordinary character, and that if any party refuses or otherwise fails to act, or to cause its Affiliates to act, in accordance with the provisions of this Agreement, such refusal or failure would result in irreparable injury to the Company or the Investors as the case may be, the exact amount of which would be difficult to ascertain or estimate and the remedies at law for which would not be reasonable or adequate compensation. Accordingly, if any party refuses or otherwise fails to act, or to cause its Affiliates to act, in accordance with the provisions of this Agreement, then, in addition to any other remedy which may be available to any damaged party at law or in equity, such damaged party will be entitled to seek specific performance and injunctive relief, without posting bond or other security, and without the necessity of proving actual or threatened damages, which remedy such damaged party will be entitled to seek in any court of competent jurisdiction.

10.14 Remedies. The rights, powers and remedies of the parties under this Agreement are cumulative and not exclusive of any other right, power or remedy which such parties may have under any other agreement or Law. No single or partial assertion or exercise of any right, power or remedy of a party hereunder shall preclude any other or further assertion or exercise thereof.

(Signature Page Follows)

IN WITNESS WHEREOF, the parties have executed and delivered this Agreement as of the date first above written.

BXLS V – BODYGUARD, L.P.

By: Blackstone Life Sciences Advisors L.L.C. on behalf of
BXLS V – Bodyguard, L.P.

By: /s/ Robert Liptak
Name: Robert Liptak
Title: Authorized Person

Signature Page to Stock Purchase Agreement

IN WITNESS WHEREOF, the parties have executed and delivered this Agreement as of the date first above written.

**BXLS FAMILY INVESTMENT PARTNERSHIP (CYM)
V – ESC L.P.**

By: Blackstone Life Sciences V (CYM) AIV GP L.P.

By: BXLS V L.L.C., its general partner

By: /s/ Robert Liptak
Name: Robert Liptak
Title: Authorized Person

Signature Page to Stock Purchase Agreement

IN WITNESS WHEREOF, the parties have executed and delivered this Agreement as of the date first above written.

**BLACKSTONE FAMILY TACTICAL
OPPORTUNITIES INVESTMENT PARTNERSHIP II
ESC L.P.**

By: Blackstone Tactical Opportunities Advisors L.L.C. on
behalf of Blackstone Family Tactical Opportunities
Investment Partnership III ESC L.P.

By: /s/ Christopher J. James

Name: Christopher J. James

Title: Authorized Person

BTO BODYGUARD HOLDINGS DE L.P.

By: Blackstone Tactical Opportunities Advisors L.L.C. on
behalf of Blackstone Holdings DE L.P.

By: /s/ Christopher J. James

Name: Christopher J. James

Title: Authorized Person

Signature Page to Stock Purchase Agreement

IN WITNESS WHEREOF, the parties have executed and delivered this Agreement as of the date first above written.

GSO CAPITAL OPPORTUNITIES FUND III LP

By: GSO Capital Opportunities Associates II LLC, its
general partner

By: GSO Holdings I L.L.C., its managing member

By: /s/ Marisa J. Beeney
Name: Marisa J. Beeney
Title: Authorized Person

GSO CSF III HOLDCO LP

By: GSO Capital Solutions Associates III LP, its general
partner

By: GSO Capital Solutions Associates III (Delaware) LLC,
its general partner

By: /s/ Marisa J. Beeney
Name: Marisa J. Beeney
Title: Authorized Person

Signature Page to Stock Purchase Agreement

IN WITNESS WHEREOF, the parties have executed and delivered this Agreement as of the date first above written.

BEMAP MASTER FUND LTD.

By: Blackstone Alternative Asset Management L.P., its
investment manager

By: /s/ Peter Koffler
Name: Peter Koffler
Title: Authorized Person

Signature Page to Stock Purchase Agreement

IN WITNESS WHEREOF, the parties have executed and delivered this Agreement as of the date first above written.

ALNYLAM PHARMACEUTICALS, INC.

By: /s/ John M. Maraganore
Name: John M. Maraganore, Ph.D.
Title: Chief Executive Officer

Signature Page to Stock Purchase Agreement

EXHIBIT A

SCHEDULE OF INVESTORS

<u>Investor</u>	<u>Number of Shares of Common Stock</u>	<u>Aggregate Purchase Price</u>
BXLS V – Bodyguard, L.P. Acct. #:[***]	508,766	\$ 52,804,823.14
BXLS Family Investment Partnership (CYM) V—ESC L.P. Acct. #:[***]	8,625	\$ 895,188.75
Blackstone Family Tactical Opportunities Investment Partnership III ESC L.P. Acct. #:[***]	519	\$ 53,867.01
BTO Bodyguard Holdings DE L.P. Acct. #:[***]	119,917	\$ 12,446,185.43
GSO Capital Opportunities Fund III LP GSO CSF III Holdco LP Acct. #:[***]	89,122	\$ 9,249,972.38
BEMAP Master Fund Ltd. Acct. #:[***]	89,123	\$ 9,250,076.17
	147,414	\$ 15,300,099.06

EXHIBIT B
NOTICES

(a) If to the Investors:

BXLS V – Bodyguard, L.P.;
BXLS Family Investment Partnership
(CYM) V—ESC L.P.:
Blackstone Life Sciences
101 Main Street, Suite 1210
Cambridge, MA 02142
Attention: [***]
Email: [***]

with a copy, which shall not constitute notice to:

Blackstone Life Sciences
101 Main Street, Suite 1210
Cambridge, MA 02142
Attention: [***]
Email: [***]

BEMAP Master Fund Ltd.:
Blackstone Alternative Asset Management
345 Park Avenue
New York, NY 10154
Attention: [***]
Email: [***]

with a copy, which shall not constitute notice to:

Blackstone Alternative Asset Management
345 Park Avenue
New York, NY 10154
Attention: [***]
Email: [***]

with a copy to:

Ropes & Gray LLP
Prudential Tower
800 Boylston Street
Boston, MA 02199-3600
Attention: Michael Beauvais
Zachary Blume
Email: Michael.Beauvais@ropesgray.com
Zachary.Blume@ropesgray.com

GSO Capital Opportunities Fund III LP;
GSO CSF III Holdco LP:
GSO Capital Partners
345 Park Avenue
New York, NY 10154
Attention: [***]
Email: [***]

with a copy, which shall not constitute notice to:

GSO Capital Partners
345 Park Avenue
New York, NY 10154
Attention: [***]
Email: [***]

Blackstone Family Tactical Opportunities Investment Partnership III
ESC L.P.;
BTO Bodyguard Holdings DE L.P.:
Blackstone Tactical Opportunities
345 Park Avenue
New York, NY 10154
Attention: [***]
Email: [***]

with a copy, which shall not constitute notice to:

Blackstone Tactical Opportunities
345 Park Avenue
New York, NY 10154
Attention: [***]
Email: [***]

(b) If to the Company:

Alnylam Pharmaceuticals, Inc.
675 West Kendall Street
Henri A. Termeer Square
Cambridge, MA 02142
Attention: Legal Department

with a copy to:

Goodwin Procter LLP
100 Northern Avenue
Boston, MA 02210
Attention: Mitchell S. Bloom, Esq.
Gregg L. Katz, Esq.

(c) If to the Transfer Agent:

Computershare Trust Company, N.A.
Meidinger Tower
462 South 4th Street
Louisville, KY 40202
Attn: Sharona Ellevold
Email: Sharona.Ellevold@computershare.com



Goodwin Procter LLP
100 Northern Avenue
Boston, MA 02210

goodwinlaw.com
+1 617 570 1000

June 5, 2020

Alnylam Pharmaceuticals, Inc.
675 West Kendall Street
Henri A. Termeer Square
Cambridge, Massachusetts 02142

Re: Securities Registered under Registration Statement on Form S-3

We have acted as counsel to you in connection with your filing of a Registration Statement on Form S-3 (as amended or supplemented, the “Registration Statement”) filed on June 5, 2020 with the Securities and Exchange Commission (the “Commission”) pursuant to the Securities Act of 1933, as amended (the “Securities Act”), relating to the registration of the sale of up to 963,486 shares (the “Selling Stockholder Shares”) of common stock, par value \$0.01 per share (“Common Stock”) of Alnylam Pharmaceuticals, Inc., a Delaware corporation (the “Company”) to be sold by the selling stockholders listed in the Registration Statement under “Selling Stockholders” (the “Selling Stockholders”). The Shares may be sold by the Selling Stockholders named in, and pursuant to, a stock purchase agreement among the Company and such Selling Stockholders, dated as of April 10, 2020 (the “Stock Purchase Agreement”).

We have reviewed such documents and made such examination of law as we have deemed appropriate to give the opinions set forth below. We have relied, without independent verification, on certificates of public officials and, as to matters of fact material to the opinions set forth below, on certificates of officers of the Company. For purposes of the opinion set forth below, we have assumed that before the Shares are issued the Company does not issue shares of Common Stock or reduce the total number of shares of Common Stock that the Company is authorized to issue under its certificate of incorporation such that the number of unissued shares of Common Stock authorized under the Company’s certificate of incorporation is less than the number of Shares.

The opinion set forth below is limited to the Delaware General Corporation Law.

Based on the foregoing, we are of the opinion that the Selling Stockholder Shares have been duly authorized and validly issued and are fully paid and nonassessable.

We hereby consent to the inclusion of this opinion as Exhibit 5.1 to the Registration Statement and to the references to our firm under the caption “Legal Matters” in the Registration Statement. In giving our consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations thereunder.

Very truly yours,

/s/ Goodwin Procter LLP

GOODWIN PROCTER LLP

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in this Registration Statement on Form S-3 of Alnylam Pharmaceuticals, Inc. of our report dated February 13, 2020 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in Alnylam Pharmaceutical's Annual Report on Form 10-K for the year ended December 31, 2019. We also consent to the reference to us under the heading "Experts" in such Registration Statement.

/s/ PricewaterhouseCoopers LLP
Boston, Massachusetts
June 5, 2020