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

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**FORM S-8**  
**POST-EFFECTIVE AMENDMENT NO. 1 TO:**  
**FORM S-8 REGISTRATION STATEMENT NO. 333-165105**  
**FORM S-8 REGISTRATION STATEMENT NO. 333-190498**  
**FORM S-8 REGISTRATION STATEMENT NO. 333-207251**  
**FORM S-8 REGISTRATION STATEMENT NO. 333-219840**  
*UNDER*  
*THE SECURITIES ACT OF 1933*

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**Anylam Pharmaceuticals, Inc.**

(Exact Name of Registrant as Specified in Its Charter)

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Delaware  
(State or Other Jurisdiction of  
Incorporation or Organization)

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

300 Third Street  
Cambridge, Massachusetts  
(Address of Principal Executive Offices)

02142  
(Zip Code)

2018 Stock Incentive Plan  
Second Amended and Restated 2009 Stock Incentive Plan  
(Full Title of the Plan)

John M. Maraganore, Ph.D.  
Chief Executive Officer  
Anylam Pharmaceuticals, Inc.  
300 Third Street  
Cambridge, Massachusetts 02142  
(Name and Address of Agent For Service)

(617) 551-8200  
(Telephone Number, Including Area Code, of Agent For Service)

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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 12b2 of the Exchange Act.

Large accelerated filer

Accelerated filer

Non-accelerated filer  (Do not check if a smaller reporting company)

Smaller reporting company

Emerging growth company

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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.

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#### EXPLANATORY NOTE

On May 10, 2018 (the “Approval Date”), the shareholders of Alnylam Pharmaceuticals, Inc. (the “Company”) approved the Company’s 2018 Stock Incentive Plan (the “2018 Plan”). The total number of shares of the Company’s common stock, par value \$0.01 per share (the “Common Stock”), that may be granted under the 2018 Plan includes, in addition to 3,500,000 new shares (registered concurrently on a new registration statement on Form S-8), (i) the number of shares available for future awards under the Company’s Second Amended and Restated 2009 Stock Incentive Plan (the “2009 Plan”) as of the Approval Date and (ii) the number of undelivered shares subject to outstanding awards under the 2009 Plan that again become available for future awards under the 2018 Plan as provided for in the 2018 Plan (the shares described in (i) and (ii) the “Prior Plans’ Shares”).

In accordance with Item 512(a)(1)(iii) of Regulation S-K and Compliance and Disclosure Interpretation 126.43, this Post-Effective Amendment No. 1 to Registration Statement No. 333-165105, this Post-Effective Amendment No. 1 to Registration Statement No. 333-190498, this Post-Effective Amendment No. 1 to Registration Statement No. 333-207251 and this Post-Effective Amendment No. 1 to Registration Statement No. 333-219840 (together, the “Post-Effective Amendments”) are hereby filed to cover the issuance of the Prior Plans’ Shares pursuant to the 2018 Plan.

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**PART I**

**INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS**

Information required in Part I of Form S-8 to be contained in a prospectus meeting the requirements of Section 10(a) of the Securities Act of 1933, as amended (the "Securities Act") is not required to be filed with the Securities and Exchange Commission (the "Commission") and is omitted from this registration statement in accordance with the explanatory note to Part I of Form S-8 and Rule 428 under the Securities Act.

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**PART II**

**INFORMATION REQUIRED IN THE REGISTRATION STATEMENT**

**Item 3. Incorporation of Documents by Reference.**

The registrant is subject to the informational and reporting requirements of Sections 13(a), 14, and 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and in accordance therewith files reports, proxy statements and other information with the Commission. The following documents, which are on file with the Commission, are incorporated in this registration statement by reference:

- (a) The registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2017, including the information specifically incorporated by reference into the Annual Report on Form 10-K from the registrant's definitive proxy statement for the 2018 Annual Meeting of Stockholders;
- (b) The registrant's Quarterly Reports on Form 10-Q for the fiscal quarters ended March 31, 2018 and June 30, 2018;
- (c) The registrant's Current Reports on Form 8-K filed on January 3, 2018, January 8, 2018 (solely with respect to Item 1.01 therein), March 14, 2018, April 3, 2018, April 20, 2018 and May 15, 2018; and
- (d) The description of the registrant's Common Stock contained in the registrant's registration statement on Form 8-A filed on April 8, 2014, including any amendments or reports filed for the purpose of updating such description.

All documents subsequently filed by the registrant pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act, prior to the filing of a post-effective amendment which indicates that all securities offered hereby have been sold or which deregisters all securities then remaining unsold, shall be deemed to be incorporated by reference in this registration statement and to be part hereof from the date of the filing of such documents. Any statement contained in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for the purposes of this registration statement to the extent that a statement contained herein or in any other subsequently filed document which also is or is deemed to be incorporated by reference herein modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this registration statement.

Under no circumstances will any information filed under current items 2.02 or 7.01 of Form 8-K be deemed incorporated herein by reference unless such Form 8-K expressly provides to the contrary.

**Item 4. Description of Securities.**

Not applicable.

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Item 5. Interests of Named Experts and Counsel.

Not applicable.

Item 6. 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 intend 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.

Item 7. Exemption from Registration Claimed.

Not applicable.

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Item 8. Exhibits.

<u>Number</u>	<u>Description</u>
5.1	<a href="#">Opinion of Goodwin Procter LLP, counsel to the Registrant</a>
23.1	<a href="#">Consent of Goodwin Procter LLP (included in Exhibit 5.1)</a>
23.2	<a href="#">Consent of PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm</a>
99.1	<a href="#">Second Amended and Restated 2009 Stock Incentive Plan (incorporated by reference to Exhibit 10.1 to the registrant's Quarterly Report on Form 10-Q filed on August 9, 2017 (File No. 001-36407) for the quarterly period ended June 30, 2017)</a>
99.2	<a href="#">2018 Stock Incentive Plan (incorporated by reference to Exhibit 10.1 to the registrant's Quarterly Report on Form 10-Q filed on August 2, 2018 (File No. 001-36407) for the quarterly period ended June 30, 2018)</a>

Item 9. Undertakings.

(a) 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;
- (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 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 the registration statement or any material change to such information in the registration statement;

*Provided, however,* that paragraphs (a)(i) and (a)(ii) of this section shall 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 (15 U.S.C. 78m or 78o(d)) that are incorporated by reference in this registration statement.

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(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 that 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.

(b) The undersigned registrant hereby undertakes 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 Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the 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.

(c) 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 foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act 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 Act and will be governed by the final adjudication of such issue.



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**SIGNATURES**

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused these Post-Effective Amendments to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Cambridge, Commonwealth of Massachusetts, on this 2<sup>nd</sup> day of August, 2018.

ALNYLAM PHARMACEUTICALS, INC.

By: /s/ John M. Maraganore, Ph.D.

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

Pursuant to the Securities Act of 1933, these Post-Effective Amendments have 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, Ph.D.</u> John M. Maraganore, Ph.D.	Chief Executive Officer and Director (Principal Executive Officer)	August 2, 2018
<u>/s/ Manmeet S. Soni</u> Manmeet S. Soni	Senior Vice President and Chief Financial Officer (Principal Financial Officer)	August 2, 2018
<u>/s/ Michael P. Mason</u> Michael P. Mason	Vice President, Finance and Treasurer (Principal Accounting Officer)	August 2, 2018
<u>/s/ Dennis A. Ausiello, M.D.</u> Dennis A. Ausiello, M.D.	Director	August 2, 2018
<u>/s/ Michael W. Bonney</u> Michael W. Bonney	Director	August 2, 2018
<u>/s/ John K. Clarke</u> John K. Clarke	Director	August 2, 2018
<u>/s/ Marsha H. Fanucci</u> Marsha H. Fanucci	Director	August 2, 2018
<u>/s/ Steven M. Paul, M.D.</u> Steven M. Paul, M.D.	Director	August 2, 2018
<u>/s/ David E.I. Pyott</u> David E.I. Pyott	Director	August 2, 2018
<u>/s/ Colleen F. Reitan</u> Colleen F. Reitan	Director	August 2, 2018
<u>/s/ Paul R. Schimmel, Ph.D.</u> Paul R. Schimmel, Ph.D.	Director	August 2, 2018

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/s/ Amy W. Schulman  
Amy W. Schulman

Director

August 2, 2018

/s/ Phillip A. Sharp, Ph.D.  
Phillip A. Sharp, Ph.D.

Director

August 2, 2018

August 2, 2018

Alnylam Pharmaceuticals, Inc.  
300 Third Street  
Cambridge, Massachusetts 02142

Re: Post-Effective Amendments to Form S-8

Ladies and Gentlemen:

We have acted as counsel to you in connection with your filing of Post-Effective Amendment No. 1 to Registration Statement on Form S-8 (No. 333-165105), Post-Effective Amendment No. 1 to Registration Statement on Form S-8 (No. 333-190498), Post-Effective Amendment No. 1 to Registration Statement on Form S-8 (No. 333-207251) and Post-Effective Amendment No. 1 to Registration Statement on Form S-8 (No. 333-219840) (the "Post-Effective Amendments") pursuant to the Securities Act of 1933, as amended (the "Securities Act"), on or about the date hereof relating to (i) the number of shares of common stock, \$0.01 par value per share, of Alnylam Pharmaceuticals, Inc., a Delaware corporation (the "Company") available for future awards under the Company's Second Amended and Restated 2009 Stock Incentive Plan (the "2009 Plan") that became issuable under the Company's 2018 Stock Incentive Plan (the "2018 Plan") upon the approval of the 2018 Plan by the Company's stockholders on May 10, 2018 and (ii) the number of undelivered shares subject to outstanding awards under the 2009 Plan that again become available for future awards under the 2018 Plan as provided for in the 2018 Plan (the "Shares"). The total number of shares of Common Stock that may be granted under the 2018 Plan includes the Shares and 3,500,000 shares of Common Stock registered concurrently on a new Registration Statement on Form S-8.

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 opinion set forth below, on certificates of officers of the Company.

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

For purposes of the opinion set forth below, we have assumed that no event occurs that causes the number of authorized shares of Common Stock available for issuance by the Company to be less than the number of then unissued Shares.

Based on the foregoing, we are of the opinion that the Shares have been duly authorized and, upon issuance and delivery against payment therefor in accordance with the terms of the 2018 Plan, will be validly issued, fully paid and nonassessable.

We hereby consent to the inclusion of this opinion as Exhibit 5.1 to the Post-Effective Amendments. 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-8 of Alnylam Pharmaceuticals, Inc. of our report dated February 15, 2018 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, 2017.

/s/ PricewaterhouseCoopers LLP  
Boston, MA  
August 2, 2018