

Check this box if no longer subject to Section 16. Form 4 or Form 5 obligations may continue. See Instruction 1(b).

**STATEMENT OF CHANGES IN BENEFICIAL OWNERSHIP**

Filed pursuant to Section 16(a) of the Securities Exchange Act of 1934 or Section 30(h) of the Investment Company Act of 1940

|                                                                   |         |          |                                                                                                        |                    |  |                                                                                                                                                                                                              |  |  |
|-------------------------------------------------------------------|---------|----------|--------------------------------------------------------------------------------------------------------|--------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| 1. Name and Address of Reporting Person*<br><u>Greene Barry E</u> |         |          | 2. Issuer Name and Ticker or Trading Symbol<br><u>ALNYLAM PHARMACEUTICALS, INC.</u><br>[ <u>ALNY</u> ] |                    |  | 5. Relationship of Reporting Person(s) to Issuer<br>(Check all applicable)<br>Director 10% Owner<br><input checked="" type="checkbox"/> Officer (give title below) Other (specify below)<br><b>President</b> |  |  |
| (Last)                                                            | (First) | (Middle) | 3. Date of Earliest Transaction (Month/Day/Year)<br><u>09/27/2018</u>                                  |                    |  | 6. Individual or Joint/Group Filing (Check Applicable Line)<br><input checked="" type="checkbox"/> Form filed by One Reporting Person<br>Form filed by More than One Reporting Person                        |  |  |
| 300 THIRD STREET                                                  |         |          | 4. If Amendment, Date of Original Filed (Month/Day/Year)                                               |                    |  |                                                                                                                                                                                                              |  |  |
| (Street)                                                          | (City)  | (State)  | (Zip)                                                                                                  | CAMBRIDGE MA 02142 |  |                                                                                                                                                                                                              |  |  |

**Table I - Non-Derivative Securities Acquired, Disposed of, or Beneficially Owned**

| 1. Title of Security (Instr. 3) | 2. Transaction Date (Month/Day/Year) | 2A. Deemed Execution Date, if any (Month/Day/Year) | 3. Transaction Code (Instr. 8) |   | 4. Securities Acquired (A) or Disposed Of (D) (Instr. 3, 4 and 5) |            |       | 5. Amount of Securities Beneficially Owned Following Reported Transaction(s) (Instr. 3 and 4) | 6. Ownership Form: Direct (D) or Indirect (I) (Instr. 4) | 7. Nature of Indirect Beneficial Ownership (Instr. 4) |
|---------------------------------|--------------------------------------|----------------------------------------------------|--------------------------------|---|-------------------------------------------------------------------|------------|-------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------|
|                                 |                                      |                                                    | Code                           | V | Amount                                                            | (A) or (D) | Price |                                                                                               |                                                          |                                                       |

**Table II - Derivative Securities Acquired, Disposed of, or Beneficially Owned (e.g., puts, calls, warrants, options, convertible securities)**

| 1. Title of Derivative Security (Instr. 3)   | 2. Conversion or Exercise Price of Derivative Security | 3. Transaction Date (Month/Day/Year) | 3A. Deemed Execution Date, if any (Month/Day/Year) | 4. Transaction Code (Instr. 8) |   | 5. Number of Derivative Securities Acquired (A) or Disposed of (D) (Instr. 3, 4 and 5) |     | 6. Date Exercisable and Expiration Date (Month/Day/Year) |                 | 7. Title and Amount of Securities Underlying Derivative Security (Instr. 3 and 4) | 8. Price of Derivative Security (Instr. 5) | 9. Number of derivative Securities Beneficially Owned Following Reported Transaction(s) (Instr. 4) | 10. Ownership Form: Direct (D) or Indirect (I) (Instr. 4) | 11. Nature of Indirect Beneficial Ownership (Instr. 4) |       |
|----------------------------------------------|--------------------------------------------------------|--------------------------------------|----------------------------------------------------|--------------------------------|---|----------------------------------------------------------------------------------------|-----|----------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------|-------|
|                                              |                                                        |                                      |                                                    | Code                           | V | (A)                                                                                    | (D) | Date Exercisable                                         | Expiration Date |                                                                                   |                                            |                                                                                                    |                                                           |                                                        | Title |
| Performance Stock Option 2015 (right to buy) | \$88.95                                                | 09/27/2018                           |                                                    | A <sup>(1)</sup>               |   | 10,000                                                                                 |     | 09/27/2018                                               | 12/18/2025      | Common Stock                                                                      | 10,000                                     | \$0.0                                                                                              | 30,000                                                    | D                                                      |       |
| Performance Stock Option 2016 (right to buy) | \$42.22                                                | 09/27/2018                           |                                                    | A <sup>(2)</sup>               |   | 6,250                                                                                  |     | 09/27/2018                                               | 12/20/2026      | Common Stock                                                                      | 6,250                                      | \$0.0                                                                                              | 12,500                                                    | D                                                      |       |

**Explanation of Responses:**

- On December 18, 2015, the reporting person was granted a performance based stock option to purchase shares of ALNY common stock. One quarter of the shares subject to the option will vest upon the achievement of each of four specific clinical development and regulatory events, as approved by our compensation committee. Effective September 27, 2018, the compensation committee of the Company determined the third performance criterion had been met and the option vested as to one-quarter of the shares.
- On December 20, 2016, the reporting person was granted a performance based stock option to purchase shares of ALNY common stock. One quarter of the shares subject to the option will vest upon the achievement of each of four specific clinical development, regulatory or commercial events, as approved by our compensation committee. Effective September 27, 2018, the compensation committee of the Company determined the second performance criterion had been met and the option vested as to one-quarter of the shares.

By: /s/ Michael P. Mason,  
Attorney-in-Fact For: Barry E. Greene 09/28/2018

\*\* Signature of Reporting Person Date

Reminder: Report on a separate line for each class of securities beneficially owned directly or indirectly.

\* If the form is filed by more than one reporting person, see Instruction 4 (b)(v).

\*\* Intentional misstatements or omissions of facts constitute Federal Criminal Violations See 18 U.S.C. 1001 and 15 U.S.C. 78ff(a).

Note: File three copies of this Form, one of which must be manually signed. If space is insufficient, see Instruction 6 for procedure.

Persons who respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB Number.