1. Name and Address of Reporting Person
   Vaishnav Akshay
   (Last)  (First)  (Middle)
   675 WEST KENDALL STREET
   HENRI A. TERMEER SQUARE
   (Street)
   CAMBRIDGE MA 02142
   (City)  (State)  (Zip)

2. Issuer Name and Ticker or Trading Symbol
   ALNYLAM PHARMACEUTICALS, INC. [ ALNY ]

3. Date of Earliest Transaction (Month/Day/Year)
   08/03/2022

4. If Amendment, Date of Original Filed (Month/Day/Year)

5. Relationship of Reporting Person(s) to Issuer
   Director
   10% Owner
   Other (specify below)

6. Individual or Joint/Group Filing (Check Applicable Line)
   Form filed by One Reporting Person
   Form filed by More than One Reporting Person

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

<table>
<thead>
<tr>
<th>1. Title of Security (Instr. 3)</th>
<th>2. Transaction Date (Month/Day/Year)</th>
<th>2A. Deemed Execution Date, if any (Month/Day/Year)</th>
<th>3. Transaction Code (Instr. 5)</th>
<th>4. Securities Acquired (A) or Disposed Of (D) (Instr. 3, 4 and 5)</th>
<th>5. Amount of Securities Beneficially Owned Following Reported Transaction(s) (Instr. 3 and 4)</th>
<th>6. Ownership Form: Direct (D) or Indirect (I) (Instr. 4)</th>
<th>7. Nature of Indirect Beneficial Ownership (Instr. 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Stock</td>
<td>08/03/2022</td>
<td>A(1)</td>
<td>5,083</td>
<td>A</td>
<td>$0.0</td>
<td>16,298</td>
<td>D</td>
</tr>
<tr>
<td>Common Stock</td>
<td>08/03/2022</td>
<td>A(2)</td>
<td>4,241</td>
<td>A</td>
<td>$0.0</td>
<td>20,539</td>
<td>D</td>
</tr>
<tr>
<td>Common Stock</td>
<td>08/03/2022</td>
<td>A(3)</td>
<td>3,859</td>
<td>A</td>
<td>$0.0</td>
<td>24,398</td>
<td>D</td>
</tr>
<tr>
<td>Common Stock</td>
<td>08/04/2022</td>
<td>P(4)</td>
<td>5,479</td>
<td>D</td>
<td>$189.76</td>
<td>18,919</td>
<td>D</td>
</tr>
<tr>
<td>Common Stock</td>
<td>08/04/2022</td>
<td>P(4)</td>
<td>195</td>
<td>D</td>
<td>$210.22</td>
<td>18,724</td>
<td>D</td>
</tr>
<tr>
<td>Common Stock</td>
<td>08/04/2022</td>
<td>P(4)</td>
<td>180</td>
<td>D</td>
<td>$210.66</td>
<td>18,544</td>
<td>D</td>
</tr>
<tr>
<td>Common Stock</td>
<td>08/04/2022</td>
<td>P(4)</td>
<td>198</td>
<td>D</td>
<td>$210.75</td>
<td>18,346</td>
<td>D</td>
</tr>
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<td>Common Stock</td>
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<tr>
<td>Common Stock</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table II - Derivative Securities Acquired, Disposed of, or Beneficially Owned

<table>
<thead>
<tr>
<th>1. Title of Derivative Security (Instr. 3)</th>
<th>2. Conversion or Exercise Price of Derivative Security</th>
<th>3. Transaction Date (Month/Day/Year)</th>
<th>3A. Deemed Execution Date, if any (Month/Day/Year)</th>
<th>4. Transaction Code (Instr. 5)</th>
<th>5. Number of Derivative Securities Acquired (A) or Disposed of (D) (Instr. 3, 4 and 5)</th>
<th>6. Date Exercisable and Expiration Date (Month/Day/Year)</th>
<th>7. Title and Amount of Securities Underlying Derivative Security (Instr. 3 and 4)</th>
<th>8. Price of Derivative Security (Instr. 5)</th>
<th>9. Number of derivative Securities Beneficially Owned Following Reported Transaction(s) (Instr. 4)</th>
<th>10. Ownership Form: Direct (D) or Indirect (I) (Instr. 4)</th>
<th>11. Nature of Indirect Beneficial Ownership (Instr. 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Stock</td>
<td>515</td>
<td>I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Explanation of Responses:**

1. On February 26, 2020, the reporting person was granted performance-based stock units (PSU) in connection with the 2019 year-end compensation review. One-third of the PSU award vests upon the achievement of each of three specific clinical development, regulatory or commercial events. The People, Culture and Compensation Committee of the Board determined that the second performance criterion was met and the first quarter of the PSU award vested as of August 3, 2022.

2. On October 7, 2020, the reporting person was granted a one-time strategic performance-based stock unit (PSU) award. The People, Culture and Compensation Committee of the Board determined that the performance criterion was met and the first one-third of the PSU award vested as of August 3, 2022.

3. On February 24, 2021, the reporting person was granted performance-based stock units (PSU) in connection with the 2020 year-end compensation review. One quarter of the PSU award vests upon the achievement of each of four specific clinical development, regulatory or commercial events. The People, Culture and Compensation Committee of the Board determined that the first performance criterion was met and the first quarter of the PSU award vested as of August 3, 2022.

4. Represents shares automatically sold by the Company on behalf of the reporting person pursuant to a mandatory sell-to-cover provision in the award agreement required to cover minimum statutory tax withholding obligations that became due upon the vesting event.

5. Reflects shares of ALNY common stock acquired by the reporting person under the ALNY 401(k) plan as a result of the ALNY 401(k) matching contribution program.

By: /s/ Mary Beth DeLena, Attorney-in-Fact For: Akshay Vaishnav 08/05/2022

**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).


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.