

Fanucci Marsha  
 Form 4  
 December 10, 2010

**FORM 4**

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

OMB APPROVAL

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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 OF SECURITIES**

Filed pursuant to Section 16(a) of the Securities Exchange Act of 1934, Section 17(a) of the Public Utility Holding Company Act of 1935 or Section 30(h) of the Investment Company Act of 1940

(Print or Type Responses)

1. Name and Address of Reporting Person \*  
 Fanucci Marsha

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

5. Relationship of Reporting Person(s) to Issuer

(Check all applicable)

Director  10% Owner  
 Officer (give title below)  Other (specify below)

(Last) (First) (Middle)

3. Date of Earliest Transaction (Month/Day/Year)  
 12/08/2010

300 THIRD STREET  
 (Street)

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

6. Individual or Joint/Group Filing(Check Applicable Line)

Form filed by One Reporting Person  
 Form filed by More than One Reporting Person

CAMBRIDGE, MA 02142

(City) (State) (Zip)

**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 Ownership (Instr. 4) |     |       |
|---------------------------------|--------------------------------------|--|--------------------------------|---|---|--|-----------------------------------|-----|-------|
|                                 |                                      |  |                                | (A) or (D)  | Code  | V  | Amount                            | (D) | Price |

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

**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 control number.**

SEC 1474  
 (9-02)

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

| 1. Title of Derivative | 2. Conversion | 3. Transaction Date (Month/Day/Year) | 3A. Deemed Execution Date, if | 4. Transaction | 5. Number of Derivative | 6. Date Exercisable and Expiration Date | 7. Title and Amount Underlying Security |
|------------------------|---------------|--------------------------------------|-------------------------------|----------------|-------------------------|---|---|
|------------------------|---------------|--------------------------------------|-------------------------------|----------------|-------------------------|---|---|

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| Security (Instr. 3)                       | or Exercise Price of Derivative Security | any (Month/Day/Year) | Code (Instr. 8) | Securities Acquired (A) or Disposed of (D) (Instr. 3, 4, and 5) | (Month/Day/Year) | (Instr. 3 and 4) |              |                            |
|---|--|----------------------|-----------------|---|------------------|------------------|--------------|----------------------------|
|   |  |                      | Code V          | (A) (D)   | Date Exercisable | Expiration Date  | Title        | Amount or Number of Shares |
| Non-Qualified Stock Option (right to buy) | \$ 9.14                                  | 12/08/2010           | A               | 30,000  | (1)              | 12/08/2020       | Common Stock | 30,000                     |

## Reporting Owners

| Reporting Owner Name / Address                            | Relationships |           |         |       |
|---|---------------|-----------|---------|-------|
|   | Director      | 10% Owner | Officer | Other |
| Fanucci Marsha<br>300 THIRD STREET<br>CAMBRIDGE, MA 02142 |               | X         |         |       |

## Signatures

By: /s/ Patricia L. Allen, Attorney-in-Fact For: Marsha H. Fannucci  
 Date: 12/10/2010

Signature of Reporting Person

Date

## Explanation of Responses:

- \* 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).
- (1) The stock option will vest as to one third of the shares on each of the first, second and third anniversaries of the date of grant.

Note: File three copies of this Form, one of which must be manually signed. If space is insufficient, see Instruction 6 for procedure. Potential persons who are to respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB number.