



DIVISION OF
CORPORATION FINANCE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

December 2, 2013

Via E-mail

John M. Maraganore, Ph.D.
Chief Executive Officer
Alnylam Pharmaceuticals, Inc.
300 Third Street
Cambridge, MA 02142

Re: Alnylam Pharmaceuticals, Inc.
Form 10-K for the fiscal year ended December 31, 2012
Filed February 19, 2013
File No. 000-50743

Dear Dr. Maraganore:

We have reviewed your filing and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by amending your filing, by providing the requested information, or by advising us when you will provide the requested response. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your filing and the information you provide in response to these comments, we may have additional comments.

ALN-VSP — Liver Cancer, page 13

1. We note the disclosure on page 14 indicating that you have a license agreement with Ascletis. Please disclose the material terms of this agreement under a separate caption, including the patents licensed under this agreement and how they apply to your products, all other material rights and obligations of both parties, the duration, material termination provisions, payment provisions and prior and potential future payments. Additionally, please file this agreement as an exhibit pursuant to Item 601(b)(10) of Regulation S-K. Alternatively, please provide us with an analysis supporting your determination that you are not substantially dependent upon this agreement.

Medtronic, page 19

2. We note that you entered into a collaboration agreement with Medtronic. Please disclose the milestone payments paid to date and aggregate potential milestone payments that may

be paid in the future. Please revise your disclosure to provide information about the royalty rate. For example, you may either provide a range of royalties within ten percent or a statement that the percentage is in the teens, twenties, etc. Additionally, please provide more precise information about the royalty term by stating the years during which the relevant patents will expire in each relevant jurisdiction.

The Medicines Company, page 22

3. We note that you entered into a license agreement with MedCo. Please revise your disclosure to provide more precise information about the royalty rate. For example, you may either provide a range of royalties within ten percent or a statement that the percentage is in the teens, twenties, etc. Additionally, please file this agreement as an exhibit pursuant to Item 601(b)(10) of Regulation S-K. Alternatively, please provide us with an analysis supporting your determination that you are not substantially dependent upon this agreement.

Arrowhead, page 24

4. We note that you have a collaboration agreement with Arrowhead. Please disclose the material terms of this agreement under a separate caption, including the patents licensed under this agreement and how they apply to your products, all other material rights and obligations of both parties, the duration, material termination provisions, and payment terms and the prior and potential future payments. Additionally, please file this agreement as an exhibit pursuant to Item 601(b)(10) of Regulation S-K. Alternatively, please provide us with an analysis supporting your determination that you are not substantially dependent upon this agreement.

Tekmira, page 24

5. We note your reference in the third full paragraph on page 25 to a significant buy down of milestone payments and a reduction of royalty rates payable to Tekmira resulting from the 2012 cross-licensing agreement. Please provide a range for the reduced royalty rate within ten percent.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Exchange Act of 1934 and all applicable Exchange Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

In responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;

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- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Please contact Matthew Jones at (202) 551-3786 or me at (202) 551-3715 with any other questions.

Sincerely,

/s/ Jeffrey P. Riedler

Jeffrey P. Riedler
Assistant Director