

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

DIVISION OF CORPORATION FINANCE

January 23, 2018

Michael P. Mason Vice President of Finance and Treasurer Alnylam Pharmaceuticals, Inc. 300 Third Street Cambridge, MA 02142

Re: ALNYLAM PHARMACEUTICALS, INC. Form 10-K for the Fiscal Year Ended December 31, 2016 Filed February 15, 2017 File No. 001-36407

Dear Mr. Mason:

We have completed our review of your filing. We remind you that the company and its management are responsible for the accuracy and adequacy of their disclosures, notwithstanding any review, comments, action or absence by the staff.

Division of Corporation Finance Office of Healthcare & Insurance