

ALNYLAM PHARMACEUTICALS, INC.

AMENDED AND RESTATED AUDIT COMMITTEE CHARTER

A. Purpose

The purpose of the Audit Committee of the Board of Directors (the “Board”) of Alnylam Pharmaceuticals, Inc. (the “Company”) is to:

- oversee the accounting and financial reporting processes of the Company and audits of the financial statements of the Company;
- assist the Board in the oversight of management’s monitoring of (i) the integrity of the Company’s financial statements, (ii) the Company’s compliance with legal and regulatory requirements to the extent it impacts the Company’s financial statements, (iii) the outside auditor’s qualifications and performance, and (iv) the Company’s internal accounting and financial controls;
- ensure the independence and performance of the Company’s outside auditors;
- prepare the report that the rules and regulations of the Securities and Exchange Commission (the “SEC”) require to be included in the Company’s annual proxy statement;
- provide the Board with the results of its oversight and monitoring and its recommendations derived therefrom; and
- provide to the Board such additional information and materials as it may deem helpful or necessary to make the Board aware of significant financial matters that require the attention of the Board.

In addition, the Audit Committee will undertake those specific duties and responsibilities listed below and such other duties as the Board may delegate or the rules and regulations of the SEC or any national securities exchange upon which the Company’s shares of capital stock are listed, may from time to time prescribe or require.

The Audit Committee’s function is one of oversight and does not relieve management of its responsibilities to (i) make and keep books, records and accounts, which, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company; (ii) devise and maintain an effective system of internal accounting controls; (iii) devise and maintain effective disclosure controls and procedures and internal controls over financial reporting; and (iv) prepare financial statements that are accurate and complete and fairly present the financial condition, results of operations and cash flows of the Company.

B. Structure and Membership

1. Number. Except as otherwise permitted by the applicable Nasdaq Stock Market rules, the Audit Committee shall consist of at least three members of the Board.
2. Independence. Except as otherwise permitted by the applicable Nasdaq Stock Market rules, each member of the Audit Committee shall be an “independent director” as defined by Nasdaq Stock Market Rule 5605(a)(2), meet the criteria for independence set forth in Rule 10A-3(b)(1) under the Securities Exchange Act of 1934, as amended (the “Exchange Act”) (subject to the exemptions provided in Rule 10A-3(c)), and not have participated in the preparation of the financial statements of the Company or any current subsidiary of the Company at any time during the past three years.
3. Financial Literacy. Each member of the Audit Committee must be able to read and understand fundamental financial statements, including the Company’s balance sheet, income statement, and cash flow statement, at the time of his or her appointment to the Audit Committee. In addition, at least one member must have past employment experience in finance or accounting, requisite professional certification in accounting, or any other comparable experience or background which results in the individual’s financial sophistication, including being or having been a chief executive officer, chief financial officer or other senior officer with financial oversight responsibilities. Unless otherwise determined by the Board (in which case disclosure of such determination shall be made in the Company’s annual report filed with the SEC), at least one member of the Audit Committee shall be an “audit committee financial expert” (as defined by applicable SEC rules).
4. Chair. Unless the Board elects a Chair of the Audit Committee, the Audit Committee shall elect a Chair by majority vote.
5. Compensation. The compensation of Audit Committee members shall be as determined by the Board. No member of the Audit Committee may receive, directly or indirectly, any consulting, advisory or other compensatory fee from the Company or any of its subsidiaries, other than fees paid in his or her capacity as a member of the Board or a committee of the Board.
6. Selection and Removal. Members of the Audit Committee shall be appointed by the Board, upon the recommendation of the Nominating and Corporate Governance Committee. Resignation or removal of a director from the Board, for whatever reason, shall automatically constitute resignation or removal, as applicable, from the Audit Committee. The Board may remove members of the Audit Committee from such committee, with or without cause. Vacancies occurring, for whatever reason, may be filled by the Board.

7. Quorum. A majority of the members of the Audit Committee shall constitute a quorum for purposes of holding a meeting and the Audit Committee may act by a vote of a majority of members present at such meeting.

C. Authority and Responsibilities

General

The Audit Committee shall discharge its responsibilities, and shall assess the information provided by the Company's management and the Company's registered public accounting firm (the "independent auditor"), in accordance with its business judgment. Management is responsible for the preparation, presentation and integrity of the Company's financial statements, for the appropriateness of the accounting principles and reporting policies that are used by the Company, and for establishing and maintaining adequate internal control over financial reporting. The independent auditor is responsible for auditing the Company's financial statements and the Company's internal control over financial reporting and for reviewing the Company's unaudited interim financial statements. The authority and responsibilities set forth in this Charter do not reflect or create any duty or obligation of the Audit Committee to plan or conduct any audit, to determine or certify that the Company's financial statements are complete, accurate, fairly presented, or in accordance with generally accepted accounting principles or applicable law, or to guarantee the independent auditor's reports.

Oversight of Independent Auditor

1. Selection. The Audit Committee shall be solely and directly responsible for appointing, evaluating, retaining and, when necessary, terminating the engagement of the independent auditor. The Audit Committee may, in its discretion, seek stockholder ratification of the independent auditor it appoints.
2. Independence. The Audit Committee shall take, or recommend that the full Board take, appropriate action to oversee the independence of the independent auditor. In connection with this responsibility, the Audit Committee shall (i) obtain and review the written disclosures and the letter from the independent auditor required by applicable requirements of the Public Company Accounting Oversight Board (the "PCAOB"), including PCAOB Rules 3526 and 3520, regarding the independent auditor's communications with the Audit Committee concerning independence and (ii) ensure compliance with audit partner rotation requirements. The Audit Committee shall actively engage in dialogue with the independent auditor concerning any disclosed relationships or services that might impact the objectivity and independence of the auditor. The Audit Committee may consider whether the provision of the services covered in Items 9(e)(2) and 9(e)(3) of Regulation 14A of the Exchange Act (or any successor provision) is compatible with maintaining the independent auditor's independence.
3. Compensation. The Audit Committee shall have sole and direct responsibility for setting the compensation of the independent auditor. The Audit Committee is

empowered, without further action by the Board, to cause the Company to pay the compensation of the independent auditor established by the Audit Committee.

4. Preapproval of Services. The Audit Committee shall preapprove all audit services to be provided to the Company, whether provided by the principal auditor or other firms, and all other services (review, attest and non-audit) to be provided to the Company by the independent auditor; provided, however, that de minimis non-audit services may instead be approved in accordance with applicable SEC rules.
5. Oversight. The independent auditor shall report directly to the Audit Committee, and the Audit Committee shall have sole and direct responsibility for overseeing the work of the independent auditor, including resolution of disagreements between Company management and the independent auditor regarding financial reporting. In connection with its oversight role, the Audit Committee shall, from time to time as appropriate, receive and consider the reports required to be made by the independent auditor regarding:
 - critical accounting policies and practices;
 - alternative treatments within generally accepted accounting principles for policies and practices related to material items that have been discussed with Company management, including ramifications of the use of such alternative disclosures and treatments, and the treatment preferred by the independent auditor;
 - other material written communications between the independent auditor and Company management; and
 - the independent auditor's internal quality-control procedures and any material issues raised by the most recent internal quality-control review or peer review of the independent auditor or by any inquiry or investigation by government or professional authorities, within the preceding five years, regarding one or more independent audits carried out by the independent auditor, and any steps taken to address any such issues.
6. The Audit Committee may establish, or recommend to the Board, policies with respect to the potential hiring of current or former employees of the independent auditors.

Audited Financial Statements

7. Review and Discussion. The Audit Committee shall review and discuss with the Company's management and independent auditor the overall audit plan and the Company's audited financial statements, including the matters required to be discussed pursuant to Auditing Standard No. 1301, *Communications with Audit Committees*, as adopted by the PCAOB, or as otherwise required by law, the rules of the SEC or the requirements of the Exchange Act. References to rules of the

PCAOB in this Charter shall be deemed to refer to such rules and to any substantially equivalent rules adopted to replace such rules, in each case as subsequently amended, modified or supplemented.

8. Recommendation to Board Regarding Financial Statements. The Audit Committee shall consider whether it will recommend to the Board that the Company's audited financial statements be included in the Company's Annual Report on Form 10-K.
9. Audit Committee Report. The Audit Committee shall prepare an annual committee report for inclusion where necessary in the proxy statement of the Company relating to its annual meeting of security holders.

Review of Other Financial Disclosures

10. Independent Auditor Review of Interim Financial Statements. The Audit Committee shall engage the independent auditor to perform all reviews of interim financial information prior to disclosure by the Company of such information and to discuss promptly with the Audit Committee and the Chief Financial Officer any matters identified in connection with the auditor's review of interim financial information which are required to be discussed by applicable auditing standards. The Audit Committee shall direct management to advise the Audit Committee in the event that the Company proposes to disclose interim financial information prior to completion of the independent auditor's review of interim financial information.
11. Quarterly Financial Statements. The Audit Committee shall discuss with management and the independent auditors, prior to the filing of the Company's Quarterly Reports on Form 10-Q, (1) the Company's quarterly financial statements and the Company's related disclosures under "Management's Discussion and Analysis of Financial Condition and Results of Operations," (2) such issues as may be brought to the Audit Committee's attention by the independent auditors pursuant to Auditing Standard No. 4105, *Reviews of Interim Financial Information*, adopted by the PCAOB, or as otherwise required by law, the rules of the SEC or the requirements of the Exchange Act, and including, for the avoidance of doubt, any significant judgments made in management's preparation of the financial statements, critical accounting policies used by the Company, any alternative accounting treatments discussed and any other material written communications between the independent auditor and management and (3) any significant financial reporting issues, including any restrictions on the scope of the independent auditor's work or access to required information and any significant disagreement between management and the independent auditor that have arisen in connection with the preparation of such financial statements.
12. Earnings Press Releases. The Audit Committee shall review and discuss the Company's earnings press releases, as appropriate, prior to their issuance, as well as any financial information and guidance provided to analysts and rating

agencies, as appropriate. The Chair of the Audit Committee may represent the entire Audit Committee for purposes of this review.

Controls and Procedures

13. **Oversight**. The Audit Committee shall coordinate the Board's oversight of the Company's internal control over financial reporting, disclosure controls and procedures and code of conduct with respect to accounting, audit, conflict of interest and financial matters. The Audit Committee shall receive and review the reports of the chief executive officer and the chief financial officer of the Company required by Rule 13a-14 under the Exchange Act.
14. **Internal Audit Function**. The Audit Committee shall coordinate the Board's oversight of the performance of any internal audit activities or function of the Company.
15. **Risk Management**. The Audit Committee shall discuss with management the Company's risk exposures in the areas of financial reporting, internal controls and compliance with financial, corporate securities, tax and similar regulatory or legal requirements, including guidelines and policies to govern the process by which the Company's exposure to such risk is handled.
16. **Procedures for Complaints**. The Audit Committee shall establish procedures for (i) the receipt, retention and treatment of complaints received by the Company regarding accounting, internal accounting controls or auditing matters; and (ii) the confidential, anonymous submission by employees of the Company of concerns regarding questionable accounting or auditing matters.
17. **Oversight of Related-Person Transactions**. The Audit Committee shall review the Company's policies and procedures for reviewing and approving or ratifying "related person transactions" (defined as transactions required to be disclosed pursuant to Item 404 of Regulation S-K and pursuant to the requirements of Auditing Standard No. 2410, *Related Parties*), including the Company's Related Person Transaction Policy, and recommend any changes to the Board. In accordance with the Company's Related Person Transaction Policy and Nasdaq Stock Market rules, the Audit Committee shall conduct appropriate review and oversight of all related person transactions for potential conflict of interest situations on an ongoing basis.

D. Procedures and Administration

1. **Meetings**. The Audit Committee shall meet as often as it deems necessary in order to perform its responsibilities. The Audit Committee may also act by unanimous written consent in lieu of a meeting. The Audit Committee shall periodically meet separately with: (i) the independent auditor; (ii) Company management; and (iii) the Company's internal auditors. The Audit Committee shall keep such records of its meetings as it shall deem appropriate.

2. Subcommittees. The Audit Committee may form and delegate authority to one or more subcommittees, as it deems appropriate from time to time under the circumstances (including a subcommittee consisting of a single member). Any decision of a subcommittee to preapprove audit, review, attest or non-audit services shall be presented to the full Audit Committee at its next scheduled meeting.
3. Reports to Board. The Audit Committee shall report regularly to the Board.
4. Charter. At least annually, the Audit Committee shall review and reassess the adequacy of this Charter and recommend any proposed changes to the Board for approval.
5. Independent Advisors. The Audit Committee is authorized, without further action by the Board, to engage such independent legal, accounting and other advisors as it deems necessary or appropriate to carry out its responsibilities. Such independent advisors may be the regular advisors to the Company. The Audit Committee is empowered, without further action by the Board, to cause the Company to pay the compensation of such advisors as established by the Audit Committee.
6. Investigations. The Audit Committee shall have the authority to conduct or authorize investigations into any matters within the scope of its responsibilities as it shall deem appropriate, including the authority to request any officer, employee or advisor of the Company to meet with the Audit Committee or any advisors engaged by the Audit Committee.
7. Funding. The Audit Committee is empowered, without further action by the Board, to cause the Company to pay the ordinary administrative expenses of the Audit Committee that are necessary or appropriate in carrying out its duties.

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Approved by the Board on October 10, 2017