

ARCA BIOPHARMA, INC.

AMENDED AND RESTATED AUDIT COMMITTEE CHARTER

This Amended and Restated Charter of the Audit Committee (the “Committee”) of the Board of Directors of ARCA biopharma, Inc. (the “Company”) was adopted by the Board of Directors of the Company (the “Board”) on June 9, 2016, and supersedes and replaces in its entirety the Charter of the Committee as adopted by the Board on May 1, 2009.

PURPOSE AND POLICY

The primary purpose of the Audit Committee (the “Committee”) shall be to act on behalf of the Company’s Board of Directors (the “Board”) in fulfilling the Board’s oversight responsibilities with respect to the Company’s corporate accounting and financial reporting processes, systems of internal control over financial reporting and audits of financial statements, as well as the quality and integrity of the Company’s financial statements and reports and the qualifications, independence and performance of the independent registered public accounting firm or firms engaged as the Company’s independent outside auditors for the purpose of preparing or issuing an audit report or performing audit services (the “Auditors”) The Committee shall also provide oversight assistance in connection with the Company’s legal, regulatory and ethical compliance programs as established by management and the Board. The operation of the Committee shall be subject to the Bylaws of the Company as in effect from time to time and Section 141 of the Delaware General Corporation Law.

The policy of the Committee, in discharging these obligations, shall be to maintain and foster an open avenue of communication among the Committee and the Auditors, the Company’s financial management.

COMPOSITION

The Committee shall consist of at least three members of the Board of Directors. The members of the Committee shall satisfy the independence and financial literacy requirements of The Nasdaq Stock Market (“Nasdaq”) applicable to Committee members as in effect from time to time, when and as required by Nasdaq. At least one member shall satisfy the applicable Nasdaq financial sophistication requirements as in effect from time to time. The members of the Committee shall be appointed by and serve at the discretion of the Board. Vacancies occurring on the Committee shall be filled by the Board. The Chairman of the Committee shall be appointed by the Board.

MEETINGS AND MINUTES

The Committee Chair (the “Chair”) (or in his or her absence, a member designated by the Chair or chosen by the attending members) shall preside at each meeting of the Committee and set the agendas for Committee meetings. A quorum of the Committee shall consist of a majority of the members of the Committee in office at the time of any meeting, and the vote of a majority

of the members of the Committee present at the time of a vote, in person or by telephone, if a quorum is present at that time, shall be the act of the Committee. The Committee shall have the authority to establish its own rules and procedures for notice and conduct of its meetings so long as they are not inconsistent with any provisions of the Company's bylaws that are applicable to the Committee. Any action required or permitted to be taken at a meeting of the members of the Committee may be taken without a meeting if a consent in writing setting forth the action is signed by all of the members of the Committee.

The Committee shall hold such regular or special meetings as its members shall deem necessary or appropriate, generally meeting at least four times during the calendar year. Minutes of each meeting of the Committee shall be prepared and distributed to each member of the Committee and the Secretary of the Company promptly after each meeting, and such minutes will be made available to all directors of the Company at their request. The Chairman of the Committee shall report to the Board from time to time, or whenever so requested by the Board.

AUTHORITY

The Committee shall have authority to appoint, determine compensation for (at the Company's expense), retain and oversee the Auditors as set forth in Section 10A(m)(2) of the Securities Exchange Act of 1934, as amended, and the rules thereunder and otherwise to fulfill its responsibilities under this charter. The Committee shall have authority to retain and determine compensation for, at the expense of the Company, special legal, accounting or other advisors or consultants as it deems necessary or appropriate in the performance of its duties. The Committee shall also have authority to pay, at the expense of the Company, ordinary administrative expenses that, as determined by the Committee, are necessary or appropriate in carrying out its duties. The Committee shall have authority to initiate investigations, to provide notices, including notices to the Securities and Exchange Commission, to retain experts, to recommend that the Company implement remedial or other appropriate actions and otherwise to carry out its responsibilities. Each member of the Committee shall have full access to all books, records, facilities and personnel of the Company as deemed necessary or appropriate by any member of the Committee to discharge his or her responsibilities hereunder. The Committee shall have authority to require that any of the Company's personnel, counsel, accountants (including the Auditors) or investment bankers, or any other consultant or advisor to the Company, attend any meeting of the Committee or meet with any member of the Committee or any of its special, outside legal, accounting or other, advisors or consultants. The approval of this charter by the Board shall be construed as a delegation of authority to the Committee with respect to the responsibilities set forth herein.

RESPONSIBILITIES

The Committee shall oversee the Company's financial reporting process on behalf of the Board, shall have direct responsibility for the appointment, compensation, retention and oversight of the work of the Auditors and any other registered public accounting firm engaged for the purpose of performing other review or attest services for the Company. The Auditors and each such other registered public accounting firm shall report directly and be accountable to the Committee. The Committee's functions and procedures should remain flexible to address changing circumstances most effectively. To implement the Committee's purpose and policy, the

Committee shall be charged with the following functions and processes with the understanding, however, that the Committee may supplement or (except as otherwise required by applicable laws or Nasdaq rules) deviate from these activities as appropriate under the circumstances:

1. Evaluation and Retention of Auditors. To evaluate the performance of the Auditors, to assess their qualifications (including their internal quality-control procedures and any material issues raised by that firm's most recent internal quality-control review or any investigations by regulatory authorities) and to determine whether to retain, or to terminate, the engagement of the existing Auditors, or to appoint and engage a different independent registered public accounting firm, which retention shall be subject only to ratification by the Company's stockholders.

2. Communication Prior to Engagement. Prior to engagement of any prospective Auditors, to review a written disclosure by the prospective Auditors of all relationships between the prospective Auditors, or their affiliates, and the Company, or persons in financial oversight roles at the Company, that may reasonably be thought to bear on independence, and to discuss with the prospective Auditors the potential effects of such relationships on the independence of the prospective Auditors, consistent with Ethics and Independence Rule 3526, *Communication with Audit Committees Concerning Independence* ("Rule 3526"), of the Public Company Accounting Oversight Board (United States) (the "PCAOB").

3. Approval of Audit Engagements. To determine and approve engagements of the Auditors, prior to commencement of such engagements, to perform all proposed audit, review and attest services, including the scope of and plans for the audit, the adequacy of staffing, the compensation to be paid, at the Company's expense, to the Auditors and the negotiation and execution, on behalf of the Company, of the Auditors' engagement letters, which approval may be pursuant to preapproval policies and procedures established by the Committee consistent with applicable laws and rules, including the delegation of preapproval authority to one or more Committee members so long as any such preapproval decisions are presented to the full Committee at the next scheduled meeting.

4. Approval of Non-Audit Services. To determine and approve engagements of the Auditors, prior to commencement of such engagements (unless in compliance with exceptions available under applicable laws and rules related to immaterial aggregate amounts of services), to perform any proposed permissible non-audit services, including the scope of the service and the compensation to be paid therefor, at the Company's expense, which approval may be pursuant to preapproval policies and procedures established by the Committee consistent with applicable laws and rules, including the delegation of preapproval authority to one or more Committee members so long as any such preapproval decisions are presented to the full Committee at the next scheduled meeting.

5. Audit Partner Rotation. To monitor the rotation of the partners of the Auditors on the Company's audit engagement team as required by applicable laws and rules.

6. Auditor Independence. At least annually, consistent with Rule 3526, to receive and review (i) written disclosures from the Auditors delineating all relationships between

the Auditors, or their affiliates, and the Company, or persons in financial oversight roles at the Company, that may reasonably be thought to bear on independence and (ii) a letter from the Auditors affirming their independence, to consider and discuss with the Auditors any potential effects of any such relationships on the independence of the Auditors as well as any compensation or services that could affect the Auditors' objectivity and independence, and to assess and otherwise take appropriate action to oversee the independence of the Auditors.

7. Former Employees of Auditors. To require Committee preapproval of employment by the Company of individuals employed or formerly employed by the Company's Auditors and engaged on the Company's account.

8. Audited Financial Statement Review. To review, upon completion of the audit, the financial statements proposed to be included in the Company's Annual Report on Form 10-K to be filed with the Securities and Exchange Commission and to recommend whether or not such financial statements should be so included.

9. Annual Audit Results. To review with management and the Auditors, the results of the annual audit, including the Auditors' assessment of the quality, not just acceptability, of the Company's accounting principles and practices, the Auditors' views about qualitative aspects of the Company's significant accounting practices, the reasonableness of significant judgments and estimates (including material changes in estimates), all known and likely misstatements identified during the audit (other than those considered to be immaterial by the Auditors), the adequacy of the disclosures in the financial statements and any other matters required to be communicated to the Committee by the Auditors under the standards of the PCAOB.

10. Auditor Communications. At least annually, to discuss with the Auditors the matters required to be discussed by Auditing Standard No. 16, *Communications with Audit Committees*, as adopted by the PCAOB (including any successor rule adopted by the PCAOB).

11. Quarterly Results. To review with management and the Auditors, as appropriate, the results of the Auditors' review of the Company's quarterly financial statements, prior to public disclosure of quarterly financial information, if practicable, or filing with the Securities and Exchange Commission of the Company's Quarterly Report on Form 10-Q, and any other matters required to be communicated to the Committee by the Auditors under standards of the PCAOB.

12. Management's Discussion and Analysis. To review with management and the Auditors, as appropriate, the Company's disclosures contained under the caption "Management's Discussion and Analysis of Financial Condition and Results of Operations" in its periodic reports to be filed with the Securities and Exchange Commission.

13. Press Releases. To review with management and the Auditors, as appropriate, earnings press releases, as well as the substance of financial information and earnings guidance provided to analysts and ratings agencies, which discussions may be general discussions of the type of information to be disclosed or the type of presentation to be made. The Chair of the Committee may represent the entire Committee for purposes of this discussion.

14. Accounting Principles and Policies. To review with management and the Auditors, as appropriate, significant issues that arise regarding accounting principles and financial statement presentation, including critical accounting policies and practices, alternative accounting policies available under generally accepted accounting principles (“GAAP”) related to material items discussed with management, the potential impact on the Company’s financial statements of off-balance sheet structures and any other significant reporting issues and judgments, significant regulatory, legal and accounting initiatives or developments that may have a material impact on the Company’s financial statements.

15. Risk Assessment and Management. To review and discuss with management and, as appropriate, the Auditors, the Company’s guidelines and policies with respect to risk assessment and risk management, including the Company’s major financial risk exposures and the steps taken by management to monitor and control these exposures.

16. Management Cooperation with Audit. To evaluate the cooperation received by the Auditors during their audit examination, including any significant difficulties encountered during the audit or any restrictions on the scope of their activities or access to required records, data and information and, whether or not resolved, significant disagreements with management and management’s response, if any.

17. Management Letters. To review with the Auditors and, if appropriate, management, any “management” or “internal control” letter issued or, to the extent practicable, proposed to be issued by the Auditors and management’s response, if any, to such letter, as well as any additional material written communications between the Auditors and management.¹

18. National Office Communications. To review with the Auditors, as appropriate, communications between the audit team and the Auditors’ national office with respect to accounting or auditing issues presented by the engagement.

19. Disagreements Between Auditors and Management. To review with management and the Auditors, or any other registered public accounting firm engaged to perform review or attest services, any conflicts or disagreements between management and the Auditors, or such other accounting firm, whether or not resolved, regarding financial reporting, accounting practices or policies or other matters, that individually or in the aggregate could be significant to the Company’s financial statements or the Auditors’ report, and to resolve any conflicts or disagreements regarding financial reporting.

20. Internal Control Over Financial Reporting. To confer with management and the Auditors, as appropriate, regarding the scope, adequacy and effectiveness of internal control over financial reporting including findings of significant deficiencies, or material weaknesses and any special audit steps taken in the event of material control deficiencies.

21. Executive Sessions. Periodically, to meet in separate sessions with the Auditors as appropriate, and management to discuss any matters that the Committee, the Auditors, or management believe should be discussed privately with the Committee.

22. Correspondence with Regulators. To consider and review with management, the Auditors, outside counsel, as appropriate, and any special counsel, separate accounting firm or other consultants and advisors as the Committee deems appropriate, any correspondence with regulators or governmental agencies and any published reports that raise material issues regarding the Company's financial statements or accounting policies.

23. Complaint Procedures. To establish procedures, when and as required by applicable laws and rules, for the receipt, retention and treatment of complaints received by the Company regarding accounting, internal accounting controls or auditing matters and the confidential and anonymous submission by employees of concerns regarding questionable accounting or auditing matters.

24. Engagement of Registered Public Accounting Firms. To determine and approve engagements of any registered public accounting firm (in addition to the Auditors), prior to commencement of such engagements, to perform any other review or attest service, including the compensation to be paid, at the Company's expense, to such firm and the negotiation and execution, on behalf of the Company, of such firm's engagement letter, which approval may be pursuant to preapproval policies and procedures established by the Committee consistent with applicable laws and rules, including the delegation of preapproval authority to one or more Committee members, so long as any such preapproval decisions are presented to the full Committee at the next scheduled meeting.

25. Ethical Compliance. To review the results of management's efforts to monitor compliance with the Company's programs and policies designed to ensure adherence to applicable laws and rules, as well as to its Code of Business Conduct and Ethics, including review and oversight of related-party transactions as required by Nasdaq rules. The Committee shall review and approve all significant related party transactions and shall report these transactions to the Board at least annually.

26. Investigations. To investigate any matter brought to the attention of the Committee within the scope of its duties if, in the judgment of the Committee, such investigation is necessary or appropriate.

27. Proxy Report. To review and approve the report required by the rules of the Securities and Exchange Commission to be included in the Company's annual proxy statement.

28. Annual Charter Review. To review and assess the adequacy of this charter annually and recommend any proposed changes to the Board for approval.

29. Internal Control Report. If required by applicable law, to obtain and review a report and opinion by the Auditors describing the Auditors' internal quality control review of the Company's financial reporting with respect to one or more independent audits performed by the Auditors, as well as any steps taken to address the issues raised.

30. Report to Board. To report to the Board with respect to material issues that arise regarding the quality or integrity of the Company's financial statements, the

Company's compliance with legal or regulatory requirements, the performance or independence of the Auditors, or such other matters as the Committee deems appropriate from time to time or whenever it shall be called upon to do so.

31. *Annual Committee Evaluation.* To conduct an annual evaluation of the performance of the Committee relative to the responsibilities of this charter and to report the results of the evaluation to the Board.

32. *General Authority.* To perform such other functions and to have such powers as may be necessary or appropriate in the efficient and lawful discharge of the foregoing.

It shall be the responsibility of management to prepare the Company's financial statements and periodic reports and the responsibility of the Auditors to audit those financial statements. These functions shall not be the responsibility of the Committee, nor shall it be the Committee's responsibility to ensure that the financial statements or periodic reports are complete and accurate, conform to GAAP or otherwise comply with applicable laws.

It is acknowledged that all of the above listed tasks and focus areas may not be relevant to all of the matters and tasks that the Committee may consider and act upon from time to time, and the members of the Committee in their judgment may determine the relevance thereof and the attention such items shall receive in any particular context.