

AUDIT COMMITTEE CHARTER
APTOSE BIOSCIENCES INC.
(the “Company”)

As revised and adopted by the Board of Directors (the “Board”) on March 3, 2015

1. Purpose

The primary purposes of the Audit Committee (the “Committee”) of the Board shall be to act on behalf of the Board, in fulfilling the Board’s oversight responsibilities with respect to the Company’s corporate accounting and financial reporting processes, the 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 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 other audit, review or attest 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 constating documents of the Company as in effect from time to time and applicable law.

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

The members of the Committee are not full-time employees of the Company and may or may not be accountants or auditors by profession or experts in the fields of accounting or auditing and, in any event, do not serve in such capacity. Consequently, it is not the duty of the Committee to conduct audits or to determine that the Company’s financial statements and disclosures are complete and accurate and are in accordance with generally accepted accounting principles and applicable rules and regulations. These are the responsibilities of management and the external auditors.

2. Composition

The Committee shall be comprised of a minimum three directors as determined by the Board. Each of the members of the Committee shall satisfy the independence and financial literacy requirements of any applicable securities laws, securities regulatory authorities and stock exchanges, including without limitation, requirements set out in, or by, National Instrument 52-110 Audit Committee, the Nasdaq Stock Market (“Nasdaq”), the Toronto Stock Exchange (the “TSX”) and the United States Securities and Exchange Commission, as in effect from time to time. At least one member shall satisfy the applicable Nasdaq financial sophistication requirements as in effect from time to time.

Committee members shall be appointed by the Board. Members of the Committee shall serve until their resignation or removal. The Board may fill vacancies on the Committee by a majority vote of the authorized numbers of Directors, but may remove Committee members only with the approval of a majority of the independent Directors then serving on the full Board. The Board shall designate a Committee member as the Chair of the Committee on an annual basis, or if the Board does not do so, the Committee members shall appoint a Committee member as Chair by a majority vote of the authorized number of Committee members.

3. Meetings, Reports and Resources of the Committee

(a) Meetings. In discharging its responsibilities, the Committee shall meet as often as it determines necessary or advisable, but not less frequently than quarterly. The Committee may also hold special meetings or act by unanimous written consent as the Committee may decide. The meetings may be in person or telephone. The Chair shall prepare and/or approve an agenda in advance of each meeting. The Committee shall appoint a secretary to be the secretary of each meeting of the Committee to keep written minutes of the meeting and deliberations and will ensure that such minutes are included in the Company's minute book. The Chair of the Committee shall report at the next regularly scheduled Board meeting following the applicable Committee meeting.

(b) Critical Reporting. The Committee shall 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. The Committee may invite any person to attend part or all of a meeting of the Committee.

(c) Procedures. The Committee may establish its own procedures, including the formation and delegation of authority to subcommittees, in a manner not inconsistent with this charter, the articles or applicable laws or regulations. The Chair or a majority of the Committee members may call meetings of the Committee. A majority of the members of the Committee constitute a quorum for the transaction of Committee business, and the vote of a majority of the Committee members present at the meeting at which a quorum is present shall be the act of the Committee. The Committee shall review, discuss and assess its own performance at least annually. The Committee shall also periodically review (at least annually) and assess the adequacy of this charter, including the Committee's role and responsibilities as outlined in this charter, and shall recommend any proposed changes to the Board of its consideration. The Committee may meet in separate sessions with the Auditors, as appropriate, and management and other directors to discuss any matters that the Committee, the Auditors or management believe should be discussed privately with the Committee.

(d) Reports. The Committee shall prepare the report required by the rules of the Securities and Exchange Commission (the "SEC") to be included in the Company's annual proxy statement (if the Company is required to file an annual proxy statement pursuant to SEC rules), as well as any other report required of the Committee under applicable laws.

(e) Committee Access and Resources. The Committee shall have authority to appoint, determine compensation for, and at the Company's expense, retain and oversee the Auditors subject to applicable law and regulations including Section 10A(m)(2) of the United States Securities Exchange Act of 1934, as amended, and the rules thereunder and otherwise to fulfill its responsibilities under this charter. The Committee is at all times authorized to have direct, independent and confidential access to the Company's other directors, management and personnel to carry out the Committee's purposes. The Committee is also authorized to retain and terminate at the Company's expense, independent counsel or other advisers selected by the Committee for matters related to the Committee's purposes.

4. Authority and Responsibilities

The Committee shall oversee the Company's financial reporting process on behalf of the Board, and shall have direct responsibility for the 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 most effectively changing circumstances. 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 rules) deviate from these activities as appropriate under the circumstances:

(a) Evaluation and Retention of Auditors. To evaluate the performance of the Auditors, including the lead partner, 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 recommend to the Board the retention or to termination of the engagement of the existing Auditors or the appointment or engagement of a different independent registered public accounting firm.

(b) 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 applicable laws, regulations and accounting rules.

(c) Approval of Audit Engagements. To determine and recommend to the Board the engagement of the Auditors, prior to commencement of such engagement, to perform all proposed audit, review and attest services, including the scope of and plans for the audit, the adequacy of staffing, to determine and recommend to the Board 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.

(d) 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.

(e) 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 and to consider periodically and, if deemed appropriate, adopt a policy regarding rotation of auditing firms.

(f) Auditor Independence. At least annually, consistent with applicable rules and regulations, to receive and review 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 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.

(g) Former Employees of Auditor. To consider and, if deemed appropriate, adopt clear policies regarding Committee preapproval of employment by the Company of individuals employed or formerly employed by the Auditors and engaged on the Company's account.

(h) Audited Financial Statement Review. To review, upon completion of the audit, the financial statements proposed to be included in the Company's public disclosure documents, including financial news releases, management's discussion and analysis, registration statements, annual reports, including on Form 10-K or Form 20-F, as applicable, to be filed on SEDAR and/or with the SEC, management's discussion and analysis and to recommend whether or not such financial statements and other materials should be approved by the Board for disclosure.

(i) 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 the Auditors believe to be trivial), 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 applicable accounting rules.

(j) Auditor Communications. At least annually, to discuss with the Auditors the matters required to be discussed by applicable law, regulations and accounting rules.

(k) Quarterly Results. To review and discuss with management and the Auditors, as appropriate, the results of the Auditors' review of the Company's quarterly financial statements and approve such quarterly financial statements, prior to public disclosure of quarterly financial information or filing of any required disclosure with any securities regulatory authority, including the filing with the SEC of the Company's Quarterly Report on Form 10-Q (if required by SEC rules), and to discuss with the Auditors any other matters required to be communicated to the Committee by the Auditors under generally accepted auditing standards, as appropriate.

(l) Management's Discussion and Analysis. To review and discuss 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 SEC and the disclosure in the "Management's Discussion and Analysis" to be filed with applicable securities regulatory authorities in Canada.

(m) Press Releases. To review and discuss with management and the Auditors, as appropriate, earnings press releases, and press releases containing information relating to material developments as well as the substance of financial information, information relating to material developments 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.

(n) 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 international financial reporting standards, in Canada, and generally accepted accounting principles, in the United States, 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, compliance programs and policies if, in the judgment of the Committee, such review is necessary or appropriate. To approve, if appropriate, major changes to the Company's accounting principles and practices as suggested by the independent auditors or management and assure that the reasoning is described in determining the appropriateness of changes in accounting principles and disclosures.

(o) 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; and to review and discuss with management insurance programs, including director and officer insurance, product liability insurance and general liability insurance (but excluding compensation and benefits-related insurance).

(p) Management Cooperation with Audit. To evaluate the cooperation received by the Auditors during their audit examination, including a review with the Auditors of 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.

(q) Management Letters. To review and discuss 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.

(r) National Office Communications. To review and discuss 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.

(s) 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.

(t) 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 significant deficiencies or material weaknesses identified by the Company's Auditors. To review with the management and the Auditors any fraud, whether or not material, that includes management or other employees who have any significant role in the Company's internal control over financial reporting and any significant changes in internal controls or other factors that could significantly affect internal controls, including any corrective actions in regard to significant deficiencies or material weaknesses.

(u) 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.

(v) 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, and to establish such procedures as the Committee may deem appropriate for the receipt, retention and treatment of complaints received by the Company with respect to any other matters that may be directed to the Committee for review and assessment.

(w) Ethical Compliance; Compliance with Legal and Regulatory Requirements. 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, as amended from time to time, and regarding legal matters and compliance with legal and regulatory requirements that may have a material effect on the Company's business, financial statements or compliance policies, including any material reports or inquiries from regulatory or governmental agencies. To review with the Company's counsel, on at least an annual basis, any legal matters that could have a significant impact on the organization's financial statements and the Company's compliance with applicable laws and regulations.

(x) Related-Party Transactions. To review and provide oversight of related-party transactions, as required by applicable securities laws and the rules and regulations of applicable securities regulatory authorities and stock exchanges, in accordance with the Company's Disclosure and Insider Trading Policy and Code of Business Conduct and Ethics.

(y) Engagement of Registered Public Accounting Firms. To determine and recommend to the Board for approval the engagement of any registered public accounting firm (in addition to the Auditors), prior to commencement of such engagement, to perform any other review or attest service, including the recommendation to the Board of 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. To discharge such Auditors when circumstances warrant.

(z) Investment Policy. To review, on a periodic basis, as appropriate, the Company's investment policy and recommend to the Board any changes to the investment policy.

(aa) 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.

(bb) Hiring Policies of Auditors. To review and approve the Company's hiring policies with respect to partners, employees and former partners and employees of the current and former Auditors of the Company.

(cc) Disclosure. To describe in the Company's annual information form the Committee's composition and responsibilities and how they were discharged.

The approval of this Audit Committee Charter shall be construed as delegation of authority to the Audit Committee with respect to the responsibilities set forth herein.