

REGISTRATION RIGHTS AGREEMENT

REGISTRATION RIGHTS AGREEMENT (this “**Agreement**”), dated as of October 27, 2017, by and between **APTOSE BIOSCIENCES INC.**, a corporation organized under the laws of Canada (the “**Company**”), and **ASPIRE CAPITAL FUND, LLC**, an Illinois limited liability company (together with its permitted assigns, the “**Buyer**”). Capitalized terms used herein and not otherwise defined herein shall have the respective meanings set forth in the Common Shares Purchase Agreement by and between the parties hereto, dated as of the date hereof (as amended, restated, supplemented or otherwise modified from time to time, the “**Purchase Agreement**”).

WHEREAS:

A. Upon the terms and subject to the conditions of the Purchase Agreement, (i) the Company has agreed to issue to the Buyer, and the Buyer has agreed to purchase, up to Fifteen Million Five Hundred Thousand Dollars (\$15,500,000) of common shares of the Company without par value (the “**Common Shares**”), pursuant to Section 1 of the Purchase Agreement (such shares, the “**Purchase Shares**”), and (ii) the Company has agreed to issue to the Buyer such number of shares of Common Shares as is required pursuant to Section 4(e) of the Purchase Agreement (the “**Commitment Shares**”); and

B. To induce the Buyer to enter into the Purchase Agreement, the Company has agreed to provide certain registration rights under the Securities Act of 1933, as amended, and the rules and regulations thereunder, or any similar successor statute (collectively, the “**1933 Act**”), and applicable state securities laws.

NOW, THEREFORE, in consideration of the promises and the mutual covenants contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Company and the Buyer hereby agree as follows:

1. DEFINITIONS.

As used in this Agreement, the following terms shall have the following meanings:

a. “**Person**” means any person or entity including any corporation, a limited liability company, an association, a partnership, an organization, a business, an individual, a governmental or political subdivision thereof or a governmental agency.

b. “**Register**,” “**registered**,” and “**registration**” refer to a registration effected by preparing and filing one or more registration statements of the Company in compliance with the 1933 Act and pursuant to Rule 415 under the 1933 Act or any successor rule providing for offering securities on a continuous basis (“**Rule 415**”), and the declaration or ordering of effectiveness of such registration statement(s) by the U.S. Securities and Exchange Commission (the “**SEC**”).

c. “**Registrable Securities**” means (i) all of the Commitment Shares and Initial Purchase Shares and (ii) such number of additional Purchase Shares as reasonably determined by the Company, which may from time to time be, issued or issuable to the Buyer upon purchases of the Available Amount under the Purchase Agreement, and any Common Shares issued or issuable with

respect to the Purchase Shares, the Commitment Shares or the Purchase Agreement as a result of any stock split, stock dividend, recapitalization, exchange or similar event, without regard to any limitation on purchases under the Purchase Agreement.

d. **“Registration Statement”** means a registration statement of the Company covering only the sale by the Buyer of the Registrable Securities.

Capitalized terms used but not defined in this Agreement and defined in the Purchase Agreement shall have the same meaning in this Agreement as in the Purchase Agreement unless the context or subject matter otherwise requires.

2. REGISTRATION.

a. **Mandatory Registration.** The Company shall within twenty (20) Business Days from the date hereof file with the SEC the Registration Statement. The Registration Statement shall register only the Registrable Securities and no other securities of the Company. Except as provided herein, the Buyer and its counsel shall have a reasonable opportunity to review and comment upon such Registration Statement or any amendment to such Registration Statement and any related prospectus prior to its filing with the SEC. The Buyer shall furnish all information reasonably requested by the Company for inclusion therein. The Company shall use its reasonable best efforts to have the Registration Statement or any amendment declared effective by the SEC as soon as reasonably practicable. Subject to Permitted Delays (as defined below) and Section 3(e), the Company shall use reasonable best efforts to keep the Registration Statement effective pursuant to Rule 415 promulgated under the 1933 Act and available for sales of all of the Registrable Securities at all times until the earlier of (i) the date as of which the Buyer may sell all of the Registrable Securities without restriction pursuant to Rule 144 promulgated under the 1933 Act (or successor thereto) or (ii) the date on which the Buyer shall have sold all the Registrable Securities and no Available Amount remains under the Purchase Agreement (the **“Registration Period”**). Except as contemplated in Section 3(e), the Registration Statement (including any amendments or supplements thereto and prospectuses contained therein) shall not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein, or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading.

b. **Rule 424 Prospectus.** The Company shall, as required by applicable securities regulations, from time to time file with the SEC, pursuant to Rule 424 promulgated under the 1933 Act, a prospectus and prospectus supplements, if any, to be used in connection with sales of the Registrable Securities under the Registration Statement. The Buyer and its counsel shall have two (2) Business Days to review and comment upon such prospectus prior to its filing with the SEC. The Buyer shall use its reasonable best efforts to comment upon such prospectus within two (2) Business Days from the date the Buyer receives the final version of such prospectus.

c. **Sufficient Number of Shares Registered.** In the event the number of Common Shares available under the Registration Statement is insufficient to cover the Registrable Securities, the Company shall, to the extent necessary and permissible, amend the Registration Statement or file a new registration statement (a **“New Registration Statement”**), so as to cover all such Registrable Securities as soon as practicable, but in any event not later than twenty (20) Business Days after the necessity therefor arises. The Company shall use its reasonable best efforts to have such amendment

and/or New Registration Statement become effective as soon as reasonably practicable following the filing thereof.

3. RELATED OBLIGATIONS.

With respect to the Registration Statement and whenever any Registrable Securities are to be registered pursuant to Sections 2(a) and (c), including on any New Registration Statement, the Company shall use its reasonable best efforts to effect the registration of the Registrable Securities in accordance with the intended method of disposition thereof and, pursuant thereto, the Company shall have the following obligations:

a. The Company shall prepare and file with the SEC such amendments (including post-effective amendments) and supplements to any Registration Statement and the prospectus used in connection with such Registration Statement, as may be necessary to keep the Registration Statement or any New Registration Statement effective at all times during the Registration Period, subject to Permitted Delays and Section 3(e) and, during such period, comply with the provisions of the 1933 Act with respect to the disposition of all Registrable Securities of the Company covered by the Registration Statement or any New Registration Statement until such time as all of such Registrable Securities shall have been disposed of in accordance with the intended methods of disposition by the seller or sellers thereof as set forth in such Registration Statement. Should the Company file a post-effective amendment to the Registration Statement or a New Registration Statement, the Company will use its reasonable best efforts to have such filing declared effective by the SEC within thirty (30) consecutive Business Days following the date of filing, which such period shall be extended for an additional thirty (30) Business Days if the Company receives a comment letter from the SEC in connection therewith. If (i) there is material non-public information regarding the Company which the Company's Board of Directors reasonably determines not to be in the Company's best interest to disclose and which the Company is not otherwise required to disclose or (ii) there is a significant business opportunity (including, but not limited to, the acquisition or disposition of assets (other than in the ordinary course of business) or any merger, consolidation, tender offer or other similar transaction) available to the Company which the Company's Board of Directors reasonably determines not to be in the Company's best interest to disclose and which the Company would be required to disclose under a Registration Statement or a New Registration Statement, then the Company may postpone or suspend filing or effectiveness of such Registration Statement or New Registration Statement or use of the prospectus under the Registration Statement or New Registration Statement for a period not to exceed sixty (60) consecutive days, provided that the Company may not postpone or suspend its obligation under this Section 3(a) for more than ninety (90) days in the aggregate during any twelve (12) month period (each, a "**Permitted Delay**").

b. The Company shall submit to the Buyer for review and comment any disclosure in the Registration Statement, any New Registration Statement and all amendments and supplements thereto (other than prospectus supplements that consist only of a copy of a filed Form 20-F or Form 6-K or any amendment as a result of the Company's filing of a document that is incorporated by reference into the Registration Statement or New Registration Statement) containing information provided by the Buyer for inclusion in such document and any descriptions or disclosure regarding the Buyer, the Purchase Agreement, including the transaction contemplated thereby, or this Agreement at least two (2) Business Days prior to their filing with the SEC, and not file any document in a form to which Buyer reasonably and timely objects. Upon request of the Buyer, the Company shall provide to the Buyer all

disclosure in the Registration Statement or any New Registration Statement and all amendments and supplements thereto (other than prospectus supplements that consist only of a copy of a filed 20-F or Form 6-K or any amendment as a result of the Company's filing of a document that is incorporated by reference into the Registration Statement or New Registration Statement) at least two (2) Business Days prior to their filing with the SEC, and not file any document in a form to which Buyer reasonably and timely objects. The Buyer shall use its reasonable best efforts to comment upon the Registration Statement or any New Registration Statement and any amendments or supplements thereto within two (2) Business Days from the date the Buyer receives the final version thereof. The Company shall furnish to the Buyer, without charge, any correspondence from the SEC or the staff of the SEC to the Company or its representatives relating to the Registration Statement or any New Registration Statement.

c. Upon request of the Buyer, the Company shall furnish to the Buyer, (i) promptly after the same is prepared and filed with the SEC, at least one copy of the Registration Statement and any amendment(s) thereto, including financial statements and schedules, all documents incorporated therein by reference and all exhibits, (ii) upon the effectiveness of a Registration Statement, a copy of the prospectus included in such Registration Statement and all amendments and supplements thereto (or such other number of copies as the Buyer may reasonably request) and (iii) such other documents, including copies of any preliminary or final prospectus, as the Buyer may reasonably request from time to time in order to facilitate the disposition of the Registrable Securities owned by the Buyer.

d. The Company shall use reasonable best efforts to (i) register and qualify, unless an exemption from registration and qualification is available, the Registrable Securities covered by a Registration Statement under such other securities or "blue sky" laws of such jurisdictions in the United States as the Buyer reasonably requests, (ii) subject to Permitted Delays, prepare and file in those jurisdictions, such amendments (including post-effective amendments) and supplements to such registrations and qualifications as may be necessary to maintain the effectiveness thereof during the Registration Period, (iii) take such other actions as may be necessary to maintain such registrations and qualifications in effect at all times during the Registration Period, and (iv) take all other actions reasonably necessary or advisable to qualify the Registrable Securities for sale in such jurisdictions; provided, however, that the Company shall not be required in connection therewith or as a condition thereto to (x) qualify to do business in any jurisdiction where it would not otherwise be required to qualify but for this Section 3(d), (y) subject itself to general taxation in any such jurisdiction, or (z) file a general consent to service of process in any such jurisdiction. The Company shall promptly notify the Buyer who holds Registrable Securities of the receipt by the Company of any notification with respect to the suspension of the registration or qualification of any of the Registrable Securities for sale under the securities or "blue sky" laws of any jurisdiction in the United States or its receipt of actual notice of the initiation or threat of any proceeding for such purpose.

e. Subject to Permitted Delays, as promptly as reasonably practicable after becoming aware of such event or facts, the Company shall notify the Buyer in writing if the Company has determined that the prospectus included in any Registration Statement, as then in effect, includes an untrue statement of a material fact or omits to state a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading, and as promptly as reasonably practical (taking into account the Company's good faith assessment of any adverse consequences to the Company and its shareholders of premature disclosure of such event or facts) prepare a prospectus supplement or amendment to such Registration Statement to correct such untrue statement or omission, and, upon the Buyer's request, deliver a copy of such

prospectus supplement or amendment to the Buyer. In providing this notice to the Buyer, the Company shall not include any other information about the facts underlying the Company's determination and shall not in any way communicate any material nonpublic information about the Company or the Common Shares to the Buyer. The Company shall also promptly notify the Buyer in writing (i) when a prospectus or any prospectus supplement or post-effective amendment has been filed, and when a Registration Statement or any post-effective amendment has become effective (notification of such effectiveness shall be delivered to the Buyer by facsimile or e-mail on the same day of such effectiveness), (ii) of any request by the SEC for amendments or supplements to any Registration Statement or related prospectus or related information, and (iii) of the Company's reasonable determination that a post-effective amendment to a Registration Statement would be appropriate. In no event shall the delivery of a notice under this Section 3(e), or the resulting unavailability of a Registration Statement, without regard to its duration, for disposition of securities by Buyer be considered a breach by the Company of its obligations under this Agreement. The preceding sentence in this Section 3(e) does not limit whether an event of default has occurred as set forth in Section 9(a) of the Purchase Agreement.

f. The Company shall use its reasonable best efforts to prevent the issuance of any stop order or other suspension of effectiveness of any Registration Statement, or the suspension of the qualification of any Registrable Securities for sale in any jurisdiction and, if such an order or suspension is issued, to obtain the withdrawal of such order or suspension at the earliest practical time and to notify the Buyer of the issuance of such order and the resolution thereof or its receipt of actual notice of the initiation or threat of any proceeding for such purpose.

g. To the extent necessary, the Company shall promptly secure the listing of all of the Securities (subject to official notice of issuance) on the U.S. Exchange and shall maintain such listing, so long as any other Common Shares shall be so listed. The Company shall use its reasonable best efforts to maintain the Common Shares' listing on the U.S. Exchange in accordance with the requirements of this Agreement. Neither the Company nor any of its Subsidiaries shall take any action that would be reasonably expected to result in the delisting or suspension of the Common Shares on the U.S. Exchange. The Company shall pay all fees and expenses in connection with satisfying its obligations under this Section.

h. The Company shall cooperate with the Buyer to facilitate the timely preparation and delivery of certificates not bearing any restrictive legend) representing the Registrable Securities to be offered pursuant to any Registration Statement and enable such certificates to be in such denominations or amounts as the Buyer may reasonably request and registered in such names as the Buyer may request.

i. The Company shall at all times provide a transfer agent and registrar with respect to its Common Shares.

j. If reasonably requested by the Buyer, the Company shall (i) promptly incorporate in a prospectus supplement or post-effective amendment to the Registration Statement such information as the Buyer believes should be included therein relating to the sale and distribution of Registrable Securities, including, without limitation, information with respect to the number of Registrable Securities being sold, the purchase price being paid therefor and any other terms of the offering of the Registrable Securities; (ii) make all required filings of such prospectus supplement or

post-effective amendment promptly after being notified of the matters to be incorporated in such prospectus supplement or post-effective amendment; and (iii) supplement or make amendments to any Registration Statement (including by means of any document incorporated therein by reference).

k. The Company shall use its reasonable best efforts to cause the Registrable Securities covered by any Registration Statement to be registered with or approved by such other governmental agencies or authorities in the United States as may be necessary to consummate the disposition of such Registrable Securities.

l. Within one (1) Business Day after any Registration Statement is ordered effective by the SEC, the Company shall deliver to the Transfer Agent for such Registrable Securities (with copies to the Buyer) confirmation that such Registration Statement has been declared effective by the SEC, in the form attached hereto as Exhibit A. Thereafter, if reasonably requested by the Buyer at any time, the Company shall deliver to the Buyer a written confirmation of whether or not the effectiveness of such Registration Statement has lapsed at any time for any reason (including, without limitation, the issuance of a stop order) and whether or not the Registration Statement is currently effective and available to the Buyer for sale of all of the Registrable Securities.

m. The Company agrees to take all other reasonable actions as necessary and reasonably requested by the Buyer to expedite and facilitate disposition by the Buyer of Registrable Securities pursuant to any Registration Statement.

4. OBLIGATIONS OF THE BUYER.

a. The Buyer has furnished to the Company in Exhibit B hereto such information regarding itself, the Registrable Securities held by it and the intended method of disposition of the Registrable Securities held by it as required to effect the registration of such Registrable Securities and shall execute such documents in connection with such registration as the Company may reasonably request. The Company shall notify the Buyer in writing of any other information the Company reasonably requires from the Buyer in connection with any Registration Statement hereunder, and the Buyer shall promptly furnish such information to the Company. The Buyer will as promptly as practicable notify the Company of any material change in the information set forth in Exhibit B, other than changes in its ownership of the Common Shares.

b. The Buyer agrees to cooperate with the Company as reasonably requested by the Company in connection with the preparation and filing of any amendments and supplements to any Registration Statement hereunder.

c. The Buyer agrees that, upon receipt of any notice from the Company of the happening of any event or existence of facts of the kind described in Section 3(f) or any notice of the kind described in the first sentence of Section 3(e), the Buyer will immediately discontinue disposition of Registrable Securities pursuant to any registration statement(s) covering such Registrable Securities until the Buyer's receipt (which may be accomplished through electronic delivery) of the copies of the filed supplemented or amended registration statement and/or prospectus contemplated by Section 3(f) or the first sentence of Section 3(e). In addition, upon receipt of any notice from the Company of the kind described in the first sentence of Section 3(e), the Buyer will immediately discontinue purchases or sales of any securities of the Company unless such purchases or sales are in compliance with applicable

U.S. securities laws. Notwithstanding anything to the contrary, the Company shall cause its Transfer Agent to deliver as promptly as practicable Common Shares without any restrictive legend in accordance with the terms of the Purchase Agreement in connection with any sale of Registrable Securities with respect to which the Buyer has received a Purchase Notice or VWAP Purchase Notice (both as defined in the Purchase Agreement) prior to the Buyer's receipt of a notice from the Company of the happening of any event of the kind described in Section 3(f) or the first sentence of Section 3(e) and for which the Buyer has not yet settled.

5. EXPENSES OF REGISTRATION.

All reasonable expenses of the Company, other than sales or brokerage commissions and fees and disbursements of counsel for the Buyer, incurred in connection with registrations, filings or qualifications pursuant to Sections 2 and 3, including, without limitation, all registration, listing and qualifications fees, printers and accounting fees, and fees and disbursements of counsel for the Company, shall be paid by the Company.

6. INDEMNIFICATION.

a. To the fullest extent permitted by law, the Company will, and hereby does, indemnify, hold harmless and defend the Buyer, each Person, if any, who controls the Buyer, the members, the directors, officers, partners, employees, agents, representatives of the Buyer and each Person, if any, who controls the Buyer within the meaning of the 1933 Act or the Securities Exchange Act of 1934, as amended (the "**1934 Act**") (each, an "**Indemnified Person**"), against any losses, claims, damages, liabilities, judgments, fines, penalties, charges, costs, reasonable attorneys' fees, amounts paid in settlement (with the consent of the Company, such consent not to be unreasonably withheld) or reasonable expenses, (collectively, "**Claims**") reasonably incurred in investigating, preparing or defending any action, claim, suit, inquiry, proceeding, investigation or appeal taken from the foregoing by or before any court or governmental, administrative or other regulatory agency or body or the SEC, whether pending or threatened, whether or not an indemnified party is or may be a party thereto ("**Indemnified Damages**"), to which any of them may become subject insofar as such Claims (or actions or proceedings, whether commenced or threatened, in respect thereof) arise out of or are based upon: (i) any untrue statement or alleged untrue statement of a material fact in the Registration Statement, any New Registration Statement or any post-effective amendment thereto or in any filing made in connection with the qualification of the offering under the securities or other "blue sky" laws of any jurisdiction in which Registrable Securities are offered ("**Blue Sky Filing**"), or the omission or alleged omission to state a material fact required to be stated therein or necessary to make the statements therein not misleading, (ii) any untrue statement or alleged untrue statement of a material fact contained in the final prospectus (as amended or supplemented, if the Company files any amendment thereof or supplement thereto with the SEC) or the omission or alleged omission to state therein any material fact necessary to make the statements made therein, in light of the circumstances under which the statements therein were made, not misleading, or (iii) any violation or alleged violation by the Company of the 1933 Act, the 1934 Act, any other law, including, without limitation, any state securities law, or any rule or regulation thereunder relating to the offer or sale of the Registrable Securities pursuant to the Registration Statement or any New Registration Statement (the matters in the foregoing clauses (i) through (iii) being, collectively, "**Violations**"). The Company shall reimburse each Indemnified Person promptly as such expenses are incurred and are due and payable, for any reasonable legal fees or other reasonable expenses incurred by them in connection with investigating or

defending any such Claim. Notwithstanding anything to the contrary contained herein, the indemnification agreement contained in this Section 6(a): (A) shall not apply to a Claim by an Indemnified Person arising out of or based upon a Violation which occurs in reliance upon and in conformity with information furnished in writing to the Company by the Buyer or such Indemnified Person expressly for use in connection with the preparation of the Registration Statement, any New Registration Statement or any such amendment thereof or supplement thereto, if such prospectus was timely made available by the Company; (B) with respect to any superseded prospectus, shall not inure to the benefit of any such person from whom the person asserting any such Claim purchased the Registrable Securities that are the subject thereof (or to the benefit of any other Indemnified Person) if the untrue statement or omission of material fact contained in the superseded prospectus was corrected in the revised prospectus, as then amended or supplemented, if such revised prospectus was timely made available by the Company pursuant to Section 3(c) or Section 3(e), and the Buyer was promptly advised in writing not to use the incorrect prospectus prior to the use giving rise to a violation; (C) shall not be available to the extent such Claim is based on a failure of the Buyer to deliver, or to cause to be delivered, the prospectus made available by the Company, if such prospectus was theretofore made available by the Company pursuant to Section 3(c) or Section 3(e); and (D) shall not apply to amounts paid in settlement of any Claim if such settlement is effected without the prior written consent of the Company, which consent shall not be unreasonably withheld. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of the Indemnified Person and shall survive the transfer of the Registrable Securities by the Buyer pursuant to Section 9.

b. In connection with the Registration Statement or any New Registration Statement, the Buyer agrees to indemnify, hold harmless and defend, to the same extent and in the same manner as is set forth in Section 6(a), the Company, each of its directors, each of its officers who signs the Registration Statement or any New Registration Statement, each Person, if any, who controls the Company within the meaning of the 1933 Act or the 1934 Act (collectively and together with an Indemnified Person, an **"Indemnified Party"**), against any Claim or Indemnified Damages to which any of them may become subject, under the 1933 Act, the 1934 Act or otherwise, insofar as such Claim or Indemnified Damages arise out of or are based upon any Violation, in each case to the extent, and only to the extent, that such Violation occurs in reliance upon and in conformity with written information about the Buyer set forth on Exhibit B attached hereto or updated from time to time in writing by the Buyer and furnished to the Company by the Buyer expressly for use in the Registration Statement or any New Registration Statement or from the failure of the Buyer to deliver or to cause to be delivered the prospectus made available by the Company, if such prospectus was timely made available by the Company pursuant to Section 3(c) or Section 3(e); and, subject to Section 6(d), the Buyer will reimburse any legal or other expenses reasonably incurred by them in connection with investigating or defending any such Claim; provided, however, that the indemnity agreement contained in this Section 6(b) and the agreement with respect to contribution contained in Section 7 shall not apply to amounts paid in settlement of any Claim if such settlement is effected without the prior written consent of the Buyer, which consent shall not be unreasonably withheld; provided, further, however, that the Buyer shall be liable under this Section 6(b) for only that amount of a Claim or Indemnified Damages as does not exceed the net proceeds to the Buyer as a result of the sale of Registrable Securities pursuant to such registration statement. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of such Indemnified Party and shall survive the transfer of the Registrable Securities by the Buyer pursuant to Section 9.

c. Promptly after receipt by an Indemnified Person or Indemnified Party under this Section 6 of notice of the commencement of any action or proceeding (including any governmental action or proceeding) involving a Claim, such Indemnified Person or Indemnified Party shall, if a Claim in respect thereof is to be made against any indemnifying party under this Section 6, deliver to the indemnifying party a written notice of the commencement thereof, and the indemnifying party shall have the right to participate in, and, to the extent the indemnifying party so desires, jointly with any other indemnifying party similarly noticed, to assume control of the defense thereof with counsel mutually satisfactory to the indemnifying party and the Indemnified Person or the Indemnified Party, as the case may be, and upon such notice, the indemnifying party shall not be liable to the Indemnified Person or Indemnified Party for any legal or other expenses subsequently incurred by the Indemnified Person or Indemnified Party in connection with the defense thereof; provided, however, that an Indemnified Person or Indemnified Party (together with all other Indemnified Persons and Indemnified Parties that may be represented without conflict by one counsel) shall have the right to retain its own counsel with the fees and expenses to be paid by the indemnifying party, if, in the reasonable opinion of counsel retained by the indemnifying party, the representation by such counsel of the Indemnified Person or Indemnified Party and the indemnifying party would be inappropriate due to actual or potential differing interests between such Indemnified Person or Indemnified Party and any other party represented by such counsel in such proceeding. The Indemnified Party or Indemnified Person shall cooperate with the indemnifying party in connection with any negotiation or defense of any such action or claim by the indemnifying party and shall furnish to the indemnifying party all information reasonably available to the Indemnified Party or Indemnified Person which relates to such action or claim. The indemnifying party shall keep the Indemnified Party or Indemnified Person fully apprised as to the status of the defense or any settlement negotiations with respect thereto. No indemnifying party shall be liable for any settlement of any action, claim or proceeding effected without its written consent, provided, however, that the indemnifying party shall not unreasonably withhold, delay or condition its consent. No indemnifying party shall, without the consent of the Indemnified Party or Indemnified Person, consent to entry of any judgment or enter into any settlement or other compromise which does not include as an unconditional term thereof the giving by the claimant or plaintiff to such Indemnified Party or Indemnified Person of a release from all liability in respect to such claim or litigation. Following indemnification as provided for hereunder, the indemnifying party shall be subrogated to all rights of the Indemnified Party or Indemnified Person with respect to all third parties, firms or corporations relating to the matter for which indemnification has been made. The failure to deliver written notice to the indemnifying party within a reasonable time of the commencement of any such action shall not relieve such indemnifying party of any liability to the Indemnified Person or Indemnified Party under this Section 6, except to the extent that the indemnifying party is prejudiced in its ability to defend such action.

d. The indemnification required by this Section 6 shall be made by periodic payments of the amount thereof during the course of the investigation or defense, as and when bills are received or Indemnified Damages are incurred. Any person receiving a payment pursuant to this Section 6 which person is later determined to not be entitled to such payment shall return such payment to the person making it.

e. The indemnity agreements contained herein shall be in addition to (i) any cause of action or similar right of the Indemnified Party or Indemnified Person against the indemnifying party or others, and (ii) any liabilities the indemnifying party may be subject to pursuant to the law.

7. CONTRIBUTION.

To the extent any indemnification by an indemnifying party is prohibited or limited by law, the indemnifying party agrees to make the maximum contribution with respect to any amounts for which it would otherwise be liable under Section 6 to the fullest extent permitted by law; provided, however, that: (i) no seller of Registrable Securities guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the 1933 Act) shall be entitled to contribution from any seller of Registrable Securities who was not guilty of fraudulent misrepresentation; and (ii) contribution by any seller of Registrable Securities shall be limited in amount to the net amount of proceeds received by such seller from the sale of such Registrable Securities.

8. REPORTS AND DISCLOSURE UNDER THE SECURITIES ACTS.

With a view to making available to the Buyer the benefits of Rule 144 promulgated under the 1933 Act or any other similar rule or regulation of the SEC that may at any time permit the Buyer to sell securities of the Company to the public without registration (“**Rule 144**”), the Company agrees, at the Company’s sole expense, to:

a. use its reasonable best efforts to make and keep public information available, as those terms are understood and defined in Rule 144;

b. use its reasonable best efforts to file with the SEC in a timely manner all reports and other documents required of the Company under the 1933 Act and the 1934 Act so long as the Company remains subject to such requirements and the filing of such reports and other documents is required to satisfy the current public information requirements of Rule 144;

c. furnish to the Buyer so long as the Buyer owns Registrable Securities, as promptly as practicable at Buyer’s request, (i) a written statement by the Company that it has complied in all material respects with the requirements of Rule 144(c)(1)(i) and (ii), and (ii) such other information, if any, as may be reasonably requested to permit the Buyer to sell such securities pursuant to Rule 144 without registration; and

d. take such additional action as is reasonably requested by the Buyer to enable the Buyer to sell the Registrable Securities pursuant to Rule 144, including, without limitation, delivering all such legal opinions, consents, certificates, resolutions and instructions to the Company’s Transfer Agent as may be reasonably requested from time to time by the Buyer and otherwise provide reasonable cooperation to the Buyer and the Buyer’s broker to effect such sale of securities pursuant to Rule 144.

The Company agrees that damages may be an inadequate remedy for any breach of the terms and provisions of this Section 8 and that Buyer shall, whether or not it is pursuing any remedies at law, be entitled to seek equitable relief in the form of a preliminary or permanent injunctions, without having to post any bond or other security, upon any breach or threatened breach of any such terms or provisions.

9. ASSIGNMENT OF REGISTRATION RIGHTS.

The Company shall not assign this Agreement or any rights or obligations hereunder without the prior written consent of the Buyer; provided, however, that any transaction, whether by merger, reorganization, restructuring, consolidation, financing or otherwise, whereby the Company remains the surviving entity immediately after such transaction shall not be deemed an assignment. The Buyer may not assign its rights under this Agreement without the prior written consent of the Company.

10. AMENDMENT OF REGISTRATION RIGHTS.

Provisions of this Agreement may be amended and the observance thereof may be waived (either generally or in a particular instance and either retroactively or prospectively) only with the written consent of the Company and the Buyer.

11. MISCELLANEOUS.

a. Any notices, consents or other communications required or permitted to be given under the terms of this Agreement must be in writing and will be deemed to have been delivered: (i) upon receipt, when delivered personally; (ii) upon receipt, when sent by facsimile (provided confirmation of transmission is mechanically or electronically generated and kept on file by the sending party); (iii) upon receipt, when sent by electronic message (provided the recipient responds to the message and confirmation of both electronic messages are kept on file by the sending party); or (iv) one (1) Business Day after timely deposit with a nationally recognized overnight delivery service, in each case properly addressed to the party to receive the same. The addresses and facsimile numbers for such communications shall be:

If to the Company:

Aptose Biosciences Inc. 5955 Airport Road, Suite 228
Mississauga, Ontario L4V 1R9
Telephone: 650-718-5028
Facsimile: 905-234-2120
Attention: Gregory K. Chow, CFO
Email: gchow@aptose.com

With a copy (which shall not constitute notice) to:

Dorsey & Whitney LLP
Suite 1070 – 1095 West Pender Street
Vancouver, B.C. V6E 2M6
Canada
Telephone: 604-630-5199
Facsimile: 604-687-8504
Attention: Daniel M. Miller
Email: miller.dan@dorsey.com

If to the Buyer:

Aspire Capital Fund, LLC
155 North Wacker Drive, Suite 1600
Chicago, IL 60606
Telephone: 312-658-0400
Facsimile: 312-658-4005
Attention: Steven G. Martin
Email: smartin@aspirecapital.com

With a copy (which shall not constitute notice) to:

Morrison & Foerster LLP
2000 Pennsylvania Avenue, NW, Suite 6000
Washington, DC 20006
Telephone: 202-778-1611
Facsimile: 202-887-0763
Attention: Martin P. Dunn, Esq.
Email: mdunn@mofo.com

or at such other address and/or facsimile number and/or to the attention of such other person as the recipient party has specified by written notice given to each other party at least one (1) Business Day prior to the effectiveness of such change. Written confirmation of receipt (A) given by the recipient of such notice, consent or other communication, (B) mechanically or electronically generated by the sender's facsimile machine containing the time, date, and recipient facsimile number, (C) electronically generated by the sender's electronic mail containing the time, date and recipient email address or (D) provided by a nationally recognized overnight delivery service, shall be rebuttable evidence of receipt in accordance with clause (i), (ii), (iii) or (iv) above, respectively. Any party to this Agreement may give any notice or other communication hereunder using any other means (including messenger service, ordinary mail or electronic mail), but no such notice or other communication shall be deemed to have been duly given unless it actually is received by the party for whom it is intended.

b. No failure or delay in the exercise of any power, right or privilege hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any such power, right or privilege preclude other or further exercise thereof or of any other right, power or privilege.

c. The corporate laws of the Province of Ontario shall govern all issues concerning the relative rights of the Company and its shareholders. All other questions concerning the construction, validity, enforcement and interpretation of this Agreement shall be governed by the internal laws of the State of Illinois, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of Illinois or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of Illinois. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of Chicago for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or

proceeding is improper. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof to such party at the address for such notices to it under this Agreement and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. If any provision of this Agreement shall be invalid or unenforceable in any jurisdiction, such invalidity or unenforceability shall not affect the validity or enforceability of the remainder of this Agreement in that jurisdiction or the validity or enforceability of any provision of this Agreement in any other jurisdiction. **EACH PARTY HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION HERewith OR ARISING OUT OF THIS AGREEMENT OR ANY TRANSACTION CONTEMPLATED HEREBY.**

d. This Agreement, the Purchase Agreement and the other Transaction Documents constitute the entire understanding among the parties hereto with respect to the subject matter hereof and thereof. There are no restrictions, promises, warranties or undertakings, other than those set forth or referred to herein and therein. This Agreement, the Purchase Agreement and the other Transaction Documents supersede all other prior oral or written agreements between the Buyer, the Company, their affiliates and persons acting on their behalf with respect to the subject matter hereof and thereof.

e. Subject to the requirements of Section 9, this Agreement shall inure to the benefit of and be binding upon the permitted successors and assigns of each of the parties hereto.

f. The headings in this Agreement are for convenience of reference and shall not form part of, or affect the interpretation of, this Agreement.

g. This Agreement may be executed in two or more identical counterparts, all of which shall be considered one and the same agreement and shall become effective when counterparts have been signed by each party and delivered to the other party; provided that a facsimile or pdf (or other electronic reproduction of a) signature shall be considered due execution and shall be binding upon the signatory thereto with the same force and effect as if the signature were an original, not a facsimile or pdf (or other electronic reproduction of a) signature.

h. Each party shall do and perform, or cause to be done and performed, all such further acts and things, and shall execute and deliver all such other agreements, certificates, instruments and documents as the other party may reasonably request in order to carry out the intent and accomplish the purposes of this Agreement and the consummation of the transactions contemplated hereby.

i. The language used in this Agreement will be deemed to be the language chosen by the parties to express their mutual intent and no rules of strict construction will be applied against any party.

j. This Agreement is intended for the benefit of the parties hereto and their respective permitted successors and assigns, and is not for the benefit of, nor may any provision hereof be enforced by, any other Person.

* * * * *

IN WITNESS WHEREOF, the parties have caused this Registration Rights Agreement to be duly executed as of day and year first above written.

THE COMPANY:

APTOSE BIOSCIENCES INC.

By: (s) Gregory K. Chow

Name: Gregory K. Chow

Title: Chief Financial Officer

BUYER:

ASPIRE CAPITAL FUND, LLC

BY: ASPIRE CAPITAL PARTNERS, LLC

BY: SGM HOLDINGS CORP.

By: (s) Steven G. Martin

Name: Steven G. Martin

Title: President

EXHIBIT A

FORM OF NOTICE OF EFFECTIVENESS OF REGISTRATION STATEMENT

[Date]

[Transfer Agent]

[Address]

[Address]

Attention: [Contact]

RE: Aptose Biosciences Inc.

Ladies and Gentlemen:

We refer to that certain Common Shares Purchase Agreement, dated as of October 27, 2017 (the "**Purchase Agreement**"), entered into by and between **APTOSE BIOSCIENCES INC.**, a corporation organized under the laws of Canada (the "**Company**") and **ASPIRE CAPITAL FUND, LLC** (the "**Buyer**") pursuant to which the Company has agreed to issue to the Buyer common shares of the Company without par value (the "**Common Shares**"), in an amount up to Fifteen Million Five Hundred Thousand Dollars (\$15,500,000), in accordance with the terms of the Purchase Agreement. In connection with the transactions contemplated by the Purchase Agreement, the Company has registered with the U.S. Securities and Exchange Commission (the "**SEC**") the sale by the Buyer of the following shares of Common Share:

- (1) up to **[Total # of Purchase Shares, including Initial Purchase Shares]** shares of Common Share to be issued upon purchase from the Company by the Buyer from time to time (the "**Purchase Shares**"); and
- (2) 321,429 shares of Common Share which have been issued to the Buyer as a commitment fee (the "**Commitment Shares**").

In connection with the transactions contemplated by the Purchase Agreement, the Company has filed a registration statement on Form S-1 (File No. 333_____) (the "**Registration Statement**") with the SEC relating to the sale by the Buyer of the Purchase Shares and the Commitment Shares. Accordingly, we advise you that (i) the SEC has entered an order declaring the Registration Statement effective under the Securities Act of 1933 Act (the "**1933 Act**") at ___ **[A./P.]M.** on _____, 201_, (ii) we have no knowledge, after review of the stop order notification website maintained by the SEC, that any stop order suspending its effectiveness has been issued or that any proceedings for that purpose are pending before, or threatened by, the SEC and (iii) the Purchase Shares and the Commitment Shares are available for sale under the 1933 Act pursuant to the Registration Statement. **[Accordingly, and in reliance on certain covenants made by the Buyer regarding the manner of sale of the Shares, certificates representing the Shares may be issued without any restrictive legend.]**

Very truly yours,

By: _____
[Company Counsel]

CC: Aspire Capital Fund, LLC

EXHIBIT B

Information About The Buyer Furnished To The Company By The Buyer Expressly For Use In Connection With The Registration Statement and Prospectus

Aspire Capital Partners LLC (“Aspire Partners”) is the Managing Member of Aspire Capital Fund LLC (“Aspire Fund”). SGM Holdings Corp (“SGM”) is the Managing Member of Aspire Partners. Mr. Steven G. Martin (“Mr. Martin”) is the president and sole shareholder of SGM, as well as a principal of Aspire Partners. Mr. Erik J. Brown (“Mr. Brown”) is the president and sole shareholder of Red Cedar Capital Corp (“Red Cedar”), which is a principal of Aspire Partners. Mr. Christos Komissopoulos (“Mr. Komissopoulos”) is president and sole shareholder of Chrisko Investors Inc (“Chrisko”), which is a principal of Aspire Partners. Each of Aspire Partners, SGM, Red Cedar, Chrisko, Mr. Martin, Mr. Brown, and Mr. Komissopoulos may be deemed to be a beneficial owner of common shares held by Aspire Fund. Each of Aspire Partners, SGM, Red Cedar, Chrisko, Mr. Martin, Mr. Brown, and Mr. Komissopoulos disclaims beneficial ownership of the common shares held by Aspire Fund.

Plan of Distribution

The common shares may be sold or distributed in the United States from time to time by the selling stockholder directly to one or more purchasers or through brokers, dealers, or underwriters who may act solely as agents at market prices prevailing at the time of sale, at prices related to the prevailing market prices, at negotiated prices, or at fixed prices, which may be changed. The sale of the common shares offered by this prospectus may be effected in one or more of the following methods:

- ordinary brokers’ transactions;
- transactions involving cross or block trades;
- through brokers, dealers, or underwriters who may act solely as agents;
- “at the market” into an existing market for the common shares;
- in other ways not involving market makers or established business markets, including direct sales to purchasers or sales effected through agents;
- in privately negotiated transactions; or
- any combination of the foregoing.

In order to comply with the securities laws of certain states, if applicable, the common shares may be sold only through registered or licensed brokers or dealers. In addition, in certain states, the common shares may not be sold unless they have been registered or qualified for sale in the state or an exemption from the registration or qualification requirement is available and complied with.

The selling stockholder may also sell common shares under Rule 144 promulgated under the Securities Act, if available, rather than under this prospectus. In addition, the selling stockholder may transfer the common shares by other means not described in this prospectus.

Brokers, dealers, underwriters, or agents participating in the distribution of the common shares as agents may receive compensation in the form of commissions, discounts, or concessions from the selling stockholder and/or purchasers of the common shares for whom the broker-dealers may act as

agent. Aspire Capital has informed us that each such broker-dealer will receive commissions from Aspire Capital which will not exceed customary brokerage commissions.

The selling stockholder and its affiliates have agreed not to engage in any direct or indirect short selling or hedging of our common shares during the term of the Purchase Agreement.

The selling stockholder is an “underwriter” within the meaning of the Securities Act.

We have advised the selling stockholder that while it is engaged in a distribution of the common shares included in this prospectus, it is required to comply with Regulation M promulgated under the Securities Exchange Act of 1934, as amended. With certain exceptions, Regulation M precludes the selling stockholder, any affiliated purchasers, and any broker-dealer or other person who participates in the distribution from bidding for or purchasing, or attempting to induce any person to bid for or purchase any security which is the subject of the distribution until the entire distribution is complete. Regulation M also prohibits any bids or purchases made in order to stabilize the price of a security in connection with the distribution of that security. All of the foregoing may affect the marketability of the common shares offered hereby this prospectus.

We may suspend the sale of common shares by the selling stockholder pursuant to this prospectus for certain periods of time for certain reasons, including if the prospectus is required to be supplemented or amended to include additional material information.

This offering as it relates to Aspire Capital will terminate on the date that all common shares offered by this prospectus have been sold by Aspire Capital.