

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549**

**FORM S-3
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

APTOSE BIOSCIENCES INC.

(Exact name of registrant as specified in its charter)

Canada
(State or other jurisdiction of
incorporation or organization)

98-1136802
(I.R.S. Employer
Identification Number)

**251 Consumers Road, Suite 1105
Toronto, Ontario, Canada M2J 4R3
(647) 479-9828**
(Address, including zip code, and telephone number, including area code of registrant's principal executive offices)

**Aptose Biosciences U.S. Inc.
Unit 120, 12770 High Bluff Drive
San Diego, California 92130
(858) 926-2730**
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

**Daniel M. Miller
Dorsey & Whitney LLP
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**Gregory K. Chow
Chief Financial Officer
Aptose Biosciences Inc.
251 Consumers Road, Suite 1105
Toronto, Ontario M2J 4R3
Canada
(647) 479-9828**

**From time to time after the effective date of this Registration Statement
(Approximate date of commencement of proposed sale to the public)**

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box.

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

| | | | |
|-------------------------|-------------------------------------|---------------------------|-------------------------------------|
| Large accelerated filer | <input type="checkbox"/> | Accelerated filer | <input type="checkbox"/> |
| Non-accelerated filer | <input type="checkbox"/> | Smaller Reporting Company | <input checked="" type="checkbox"/> |
| Emerging growth company | <input checked="" type="checkbox"/> | | |

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

CALCULATION OF REGISTRATION FEE

| Title of Each Class of Securities To Be Registered (1) | Securities to be Registered (1) | Proposed Maximum Aggregate Offering Price (1) | Amount of Registration Fee (2) (3) |
|--|---------------------------------|---|------------------------------------|
| Common shares, no par value | | | |
| Warrants to purchase common shares | | | |
| Units | | | |
| Total | \$ 100,000,000 | \$ 100,000,000 | \$ 12,120 |

- (1) There are being registered under this registration statement such indeterminate number of common shares, warrants to purchase common shares and a combination of such securities, separately or as units, as may be sold by the registrant from time to time, which collectively shall have an aggregate initial offering price not to exceed \$100,000,000. The securities registered hereunder also include such indeterminate number of each class of identified securities as may be issued upon conversion, exercise or exchange of any other securities that provide for such conversion into, exercise for or exchange into such securities. Separate consideration may or may not be received for securities that are issuable on exercise, conversion or exchange of other securities. In addition, pursuant to Rule 416 under the Securities Act of 1933, as amended, the common shares being registered hereunder include such indeterminate number of common shares as may be issuable with respect to the shares being registered hereunder as a result of stock splits, stock dividends, or similar transactions. The proposed maximum offering price per class of security will be determined from time to time by the registrant in connection with the issuance by the registrant of the securities registered hereunder.
- (2) The registration fee has been calculated in accordance with Rule 457(o) under the Securities Act of 1933, as amended.
- (3) An aggregate of \$9,989 of the amount of the registration fee was previously paid in connection with (i) \$80,239,205 of unissued securities registered under the registrant's registration statement on Form F-10 (File No. 333-222909) initially filed February 7, 2018, which unsold securities are hereby deregistered. Accordingly, pursuant to Rule 457(p) under the Securities Act of 1933, as amended, \$9,989 is being offset against the total registration fee due for this registration statement.

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment that specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

The information in this prospectus is not complete and may be changed. We may not sell these securities or accept an offer to buy these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities, and it is not soliciting offers to buy these securities in any state where such offer or sale is not permitted.

PRELIMINARY PROSPECTUS
Subject To Completion, Dated March 12, 2019



\$100,000,000
Common Shares
Warrants
Units

We may offer and issue from time to time common shares or warrants or any combination of those securities, either individually or in units, up to an aggregate initial offering price of \$100,000,000, in one or more transactions under this prospectus. The securities may be offered in amounts, at prices and on terms to be determined based on market conditions at the time of sale and set forth in an accompanying prospectus supplement.

This prospectus provides you with a general description of the securities that we may offer. Each time we offer securities, we will provide you with a prospectus supplement that describes specific information about the particular securities being offered and may add, update or change information contained or incorporated by reference in this prospectus. You should read both this prospectus and the applicable prospectus supplement, together with the additional information that is incorporated by reference into this prospectus and the applicable prospectus supplement.

Our common shares are listed on the NASDAQ Capital Market under the symbol "APTO" and on the Toronto Stock Exchange under the symbol "APS". On March 11, 2019, the closing price of our common shares on NASDAQ was \$1.65 per share and on the Toronto Stock Exchange was C\$2.22 per share.

Investing in our securities involves a high degree of risk. You should carefully read the "Risk Factors" section of this prospectus beginning on page 2.

These securities have not been approved or disapproved by the Securities and Exchange Commission or any state securities regulatory authority, nor has the SEC or any state securities regulatory authority passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

The date of this prospectus is _____, 2019.

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ABOUT THIS PROSPECTUS

This prospectus is a part of a registration statement that we have filed with the SEC utilizing a “shelf” registration process. Under this shelf registration process, we may sell any combination of the securities described in this prospectus, either individually or in units, in one or more offerings up to an aggregate initial offering price of \$100,000,000.

This prospectus provides you with a general description of the securities that we may sell under this prospectus. Each time we sell securities, we may also provide a prospectus supplement that may include, where applicable, specific information about the terms of that offering. If there is any inconsistency between the information in this prospectus and any applicable prospectus supplement, you should rely on the information in the prospectus supplement. Where required by statute, regulation or policy, and where securities are offered in currencies other than U.S. dollars, appropriate disclosure of foreign exchange rates applicable to those securities will be included in the prospectus supplement describing those securities.

We may also prepare free writing prospectuses to describe the terms of particular sales of securities, which terms may vary from those described in any prospectus supplement. You therefore should carefully review any free writing prospectus in connection with your review of this prospectus and any applicable prospectus supplement.

Please carefully read both this prospectus and any prospectus supplement, together with the documents incorporated by reference into this prospectus and any prospectus supplement, and the additional information described below under “Where You Can Find Additional Information”. This prospectus contains summaries of certain provisions contained in some of the documents described in this prospectus, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to in this prospectus have been filed, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus is a part, and you may obtain copies of those documents as described below under “Where You Can Find Additional Information”.

You should rely only on the information contained in or incorporated by reference into this prospectus and any prospectus supplement. We have not authorized anyone to provide you with different information. The distribution or possession of this prospectus in or from certain jurisdictions may be restricted by law. This prospectus is not an offer to sell any securities and is not soliciting an offer to buy securities in any jurisdiction where the offer or sale is not permitted or where the person making the offer or sale is not qualified to do so or to any person to whom it is not permitted to make such offer or sale. The information contained in this prospectus is accurate only as of the date of this prospectus and any information incorporated by reference into this prospectus is accurate only as of the date of the applicable document incorporated by reference, regardless of the time of delivery of this prospectus or of any sale of the securities. Our business, financial condition, results of operations and prospects may have changed since that date.

As used in this prospectus and in any prospectus supplement, unless the context otherwise requires, the terms “Aptose,” the “Company,” “we,” “us,” and “our” refer to Aptose Biosciences Inc., and, unless the context requires otherwise, the subsidiaries through which it conducts business.

Unless stated otherwise or if the context otherwise requires, all references to dollar amounts in this prospectus and any prospectus supplement are references to U.S. dollars.

RISK FACTORS

An investment in our securities involves a significant degree of risk. You should carefully consider the risk factors and all of the other information included in this prospectus, any prospectus supplement, the documents we have incorporated by reference into this prospectus and any prospectus supplement, and in any related free writing prospectus, including those in Item 1A “Risk Factors” in our Annual Report on Form 10-K for the fiscal year ended December 31, 2018, as updated by annual, quarterly and other reports and documents we file with the SEC after the date of this prospectus and that are incorporated by reference into this prospectus, in evaluating an investment in our securities. If any of these risks were actually to occur, our business, financial condition or results of operations could be materially adversely affected. When we offer and sell any securities pursuant to a prospectus supplement, we may include in the applicable prospectus supplement additional risk factors relevant to those securities.

FORWARD-LOOKING STATEMENTS

This prospectus, including the documents incorporated by reference herein, contains forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995 and “forward-looking information” within the meaning of applicable Canadian securities law. We refer to such forward-looking statements and forward-looking information collectively as “forward-looking statements”. These statements relate to future events or future performance and reflect our expectations and assumptions regarding our growth, results of operations, performance and business prospects and opportunities. Such forward-looking statements reflect our current beliefs and are based on information currently available to us. In some cases, forward-looking statements can be identified by terminology such as “may”, “would”, “could”, “will”, “should”, “expect”, “plan”, “intend”, “anticipate”, “believe”, “estimate”, “predict”, “potential”, “continue” or the negative of these terms or other similar expressions concerning matters that are not historical facts. The forward-looking statements in this Prospectus and, including any documents incorporated by reference herein, include, among others, statements regarding our future operating results, economic performance and product development efforts and statements in respect of:

- our ability to obtain the substantial capital we require to fund research and operations;
- our business strategy;
- our clinical development plans;
- our plans to conduct clinical trials and preclinical programs;
- our ability to accrue appropriate numbers and types of patients;
- our reliance on external contract research/manufacturing organizations for certain activities;
- our plans to secure and maintain strategic partnerships to assist in the further development of our product candidates and to build our pipeline;
- our ability to file and maintain intellectual property to protect our pharmaceutical assets;
- potential exposure to legal actions and potential need to take action against other entities;
- our expectations regarding the progress and the successful and timely completion of the various stages of our drug discovery, drug synthesis and formulation, preclinical and clinical studies and the regulatory approval process;
- our plans, objectives, expectations and intentions; and
- other statements including words such as “anticipate”, “contemplate”, “continue”, “believe”, “plan”, “estimate”, “expect”, “intend”, “will”, “should”, “may”, and other similar expressions.

The forward-looking statements contained in this prospectus and in the documents incorporated by reference reflect our current views with respect to future events, are subject to significant risks and uncertainties, and are based upon a number of estimates and assumptions that, while considered reasonable by us, are inherently subject to significant business, economic, competitive, political and social uncertainties and contingencies. Many factors could cause our actual results, performance or achievements to be materially different from any future results, performance, or achievements that may be expressed or implied by such forward-looking statements, including, among others:

- our lack of product revenues and net losses and a history of operating losses;

- our early stage of development, particularly the inherent risks and uncertainties associated with (i) developing new drug candidates generally, (ii) demonstrating the safety and efficacy of these drug candidates in clinical studies in humans, and (iii) obtaining regulatory approval to commercialize these drug candidates;
- our need to raise substantial additional capital in the future and that we may be unable to raise such funds when needed and on acceptable terms;
- further equity financing, which may substantially dilute the interests of our existing shareholders;
- clinical studies and regulatory approvals of our drug candidates are subject to delays, and may not be completed or granted on expected timetables, if at all, and such delays may increase our costs and could substantially harm our business;
- our reliance on external contract research/manufacturing organizations for certain activities and if we are subject to quality, cost, or delivery issues with the preclinical and clinical grade materials supplied by contract manufacturers, our business operations could suffer significant harm;
- clinical studies are long, expensive and uncertain processes and the United States Food and Drug Administration, or “FDA”, or other similar foreign regulatory agency that we are required to report to, may ultimately not approve any of our product candidates;
- our ability to comply with applicable governmental regulations and standards;
- our inability to achieve our projected development goals in the time frames we announce and expect;
- difficulties in enrolling patients for clinical trials may lead to delays or cancellations of our clinical trials;
- our reliance on third-parties to conduct and monitor our preclinical studies;
- our ability to attract and retain key personnel, including key executives and scientists;
- any misconduct or improper activities by our employees;
- our exposure to exchange rate risk;
- our ability to commercialize our business attributed to negative results from clinical trials;
- the marketplace may not accept our products or product candidates due to the intense competition and technological change in the biotechnical and pharmaceuticals, and we may not be able to compete successfully against other companies in our industries and achieve profitability;
- our ability to obtain and maintain patent protection;
- our ability to afford substantial costs incurred with defending our intellectual property;
- our ability to protect our intellectual property rights and not infringe on the intellectual property rights of others;
- our business is subject to potential product liability and other claims;
- potential exposure to legal actions and potential need to take action against other entities;
- commercialization limitations imposed by intellectual property rights owned or controlled by third parties;
- our ability to maintain adequate insurance at acceptable costs;
- our ability to find and enter into agreements with potential partners;
- extensive government regulation;
- data security incidents and privacy breaches could result in increased costs and reputational harm;
- our share price has been and is likely to continue to be volatile;
- future sales of our common shares by us or by our existing shareholders could cause our share price to drop;
- changing global market and financial conditions;
- changes in an active trading market in our common shares;
- difficulties by non-Canadian investors to obtain and enforce judgments against us because of our Canadian incorporation and presence;
- potential adverse U.S. federal tax consequences for U.S. shareholders because we are a “passive foreign investment company”;
- our “emerging growth company” and “smaller reporting company” status;

- any failures to maintain an effective system of internal controls may result in material misstatements of our financial statements, or cause us to fail to meet our reporting obligations or fail to prevent fraud;
- our broad discretion in how we use the proceeds of the sale of the common shares to Aspire Capital pursuant to the purchase agreement between us and Aspire;
- any failure of Aspire to purchase common shares from us when required to do so;
- our ability to expand our business through the acquisition of companies or businesses; and
- other risks detailed from time-to-time in our on-going filings with the SEC and Canadian securities regulators, and those which are discussed under the heading “Risk Factors” in this prospectus and in the documents incorporated by reference.

Should one or more of these risks or uncertainties materialize, or should the assumptions described in the sections entitled “Risk Factors” in this prospectus and in the documents incorporated by reference underlying those forward-looking statements prove incorrect, actual results may vary materially from those described in the forward-looking statements.

More detailed information about these and other factors is included in this prospectus under the section entitled “Risk Factors” and in the documents incorporated by reference into this prospectus. Although we have attempted to identify factors that could cause actual actions, events or results to differ materially from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended. Forward-looking statements are based upon our beliefs, estimates and opinions at the time they are made and we undertake no obligation to update forward-looking statements if these beliefs, estimates and opinions or circumstances should change, except as required by applicable law. There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements.

Forward-looking statements contained in this prospectus are made as of the date of this prospectus. Forward-looking statements made in a document incorporated by reference into this prospectus are made as of the date of the original document and have not been updated by us except as expressly provided for in this prospectus.

Except as required under applicable securities legislation, we undertake no obligation to publicly update or revise forward-looking statements, whether as a result of new information, future events or otherwise. **We qualify all the forward-looking statements contained in this prospectus and the documents incorporated by reference in this prospectus by the foregoing cautionary statements.**

ENFORCEABILITY OF CIVIL LIABILITIES

We are incorporated under the laws of Canada. Many of our directors and officers and the experts named in this prospectus are residents of countries other than the United States, and all or a substantial portion of their assets and some of our assets are located outside the United States. We have appointed Aptose Biosciences U.S. Inc. as our agent for service of process in the United States, but it may be difficult for holders of securities who reside in the United States to effect service within the United States upon those directors, officers and experts who are not residents of the United States. Additionally, it may not be possible for you to enforce judgments obtained in U.S. courts based upon the civil liability provisions of the U.S. federal securities laws or other laws of the United States. In addition, there is doubt as to whether an original action could be brought in Canada against us or our directors or officers based solely upon U.S. federal or state securities laws and as to the enforceability in Canadian courts of judgments of U.S. courts obtained in actions based upon the civil liability provisions of U.S. federal or state securities laws.

APTOSE BIOSCIENCES INC.

This summary does not contain all the information about us that may be important to you. Please carefully read both this prospectus and any prospectus supplement together with the additional information contained in or incorporated by reference into this prospectus and any prospectus supplement.

Aptose is a science-driven biotechnology company advancing highly differentiated agents to treat unmet medical needs in life-threatening cancers, such as acute myeloid leukemia, or “AML”, certain B-cell malignancies, high-risk myelodysplastic syndromes, or “MDS”, and other hematologic malignancies. Based on insights into the genetic and epigenetic profiles of certain cancers and patient populations, we are building a pipeline of novel and targeted oncology therapies directed at dysregulated processes and signaling pathways in cancer cells, and this strategy is intended to optimize efficacy and quality of life by minimizing the cytotoxic side effects associated with conventional therapies and minimize the emergence of drug resistance. Our product pipeline includes cancer drug candidates that exert potent activity as stand-alone agents and that enhance the activities of other anticancer agents without causing overlapping toxicities. Indeed, we believe our targeted products can emerge as first-in-class or best-in-class agents that deliver single agent benefit and may serve as part of a combination therapeutic strategy for specific populations of cancer patients.

We currently are engaged in the development of a clinical-stage program, a late preclinical stage program, and a third program that is discovery-stage and positioned for potential partnering. Our pan-FLT3 / pan-BTK inhibitor, CG-806, is currently in the Investigational New Drug, or “IND”, review period with the FDA, with anticipation of commencing a Phase 1 in the first half of 2019. On December 26, 2017, CG-806 received orphan drug designation from the FDA for the treatment of AML. APTO-253 is our second anticancer agent and at the Phase 1b clinical stage for the treatment of patients with relapsed / refractory blood cancers, including AML and high-risk MDS, under an IND allowed by the FDA to evaluate APTO-253 as a therapeutic agent dosed on a weekly administration schedule for the treatment of certain hematologic malignancies. The APTO-253 program has received orphan drug designation from the FDA for the treatment of AML, and is currently on clinical hold while attempts are made to manufacture a newly formulated and stable clinical supply.

As noted above, we are committed to the development of anticancer drugs that target aberrant oncologic signaling processes that underlie particular life-threatening malignancies. This targeted approach is intended to impact the disease-causing events in cancer cells without affecting normal processes within cells. Such an approach requires that we first identify critical underlying oncogenic mechanisms in cancer cells and then develop a therapeutic that selectively impacts such oncogenic mechanisms. As a multi-kinase pan-FLT3 /pan-BTK inhibitor, CG-806 targets multiple critical pathways that lead to the proliferation of cancer cells, including the B-cell receptor signaling pathways (drive certain B cell malignancies) and FLT3 receptor pathways (drive AML). Further, we created the APTO-253 small molecule targeted drug that inhibits expression of the c-Myc oncogene and is under development as a novel therapy for AML and the related MDS.

We were incorporated under the *Business Corporations Act*(Ontario) on September 5, 1986 under the name RML Medical Laboratories Inc. On October 28, 1991, we amalgamated with Mint Gold Resources Ltd., which caused us to become a reporting issuer in Ontario. On August 25, 1992, we changed our name to IMUTEC Corporation. On November 27, 1996, we changed our name to Imutec Pharma Inc., and on November 19, 1998, we changed our name to Lorus Therapeutics Inc. On October 1, 2005, we continued under the *Canada Business Corporations Act* and on July 10, 2007 we completed a plan of arrangement and corporate reorganization with, among others, 6650309 Canada Inc., 6707157 Canada Inc. and Pinnacle International Lands, Inc. On May 25, 2010, we consolidated our outstanding common shares on the basis of one post-consolidation common share for each 30 pre-consolidation common shares.

On August 28, 2014 we changed our name from Lorus Therapeutics Inc. to Aptose Biosciences Inc. and on October 1, 2014 we consolidated our outstanding common shares on the basis of one post-consolidation common share for each twelve pre-consolidation common shares.

We have two subsidiaries: Aptose Biosciences U.S. Inc., a corporation incorporated under the laws of Delaware; and NuChem Pharmaceuticals Inc., a corporation incorporated under the laws of Ontario, Canada. Aptose Biosciences Inc. owns 100% of the issued and outstanding voting share capital of Aptose Biosciences U.S. Inc., and 80% of the issued and outstanding voting share capital of NuChem Pharmaceuticals Inc.

Our head, registered and records office is located at 251 Consumers Road, Suite 1105, Toronto, Ontario, Canada, M2J 4R3. Our executive office is located at 12770 High Bluff Drive, Suite 120, San Diego, CA 92130. We maintain a website at www.aptose.com. Information contained on our website is not part of this prospectus.

USE OF PROCEEDS

Unless otherwise specified in a prospectus supplement, the net proceeds that we receive from the sale of our securities will be used for working capital and general corporate purposes, including, but not limited to, progressing our research and development programs, and supporting our clinical programs and manufacturing activities.

More specific allocations may be included in a prospectus supplement relating to a specific offering of securities. All expenses relating to an offering of securities and any compensation paid to underwriters, dealers or agents, as the case may be, will be paid out of our general funds, unless otherwise stated in the applicable prospectus supplement.

DESCRIPTION OF SHARE CAPITAL, WARRANTS AND RELATED INFORMATION

The descriptions below of our share capital, warrants and related information are summaries and are qualified by reference to documents incorporated by reference to the registration statement of which this prospectus is a part.

Authorized Capital

Our authorized share capital consists of an unlimited number of common shares, no par value, of which 38,161,808 were issued and outstanding as at December 31, 2018. None of our common shares are held by us or on our behalf.

Common Shares

The holders of our common shares are entitled to receive notice of and to attend and vote at all annual and special meetings of our shareholders. Our common shares carry one vote per common share and do not have cumulative voting rights. The holders of our common shares are entitled, at the discretion of our board of directors, to receive out of any or all of our profits or surplus properly available for the payment of dividends, any dividend declared by the board of directors and payable by us on our common shares. The holders of our common shares will participate on a pro rata basis in any distribution of our remaining property upon our liquidation, dissolution or winding-up or any other return of capital or distribution of our assets among our shareholders for the purpose of winding up our affairs.

Dividend Policy

We have not paid any dividends since our incorporation. At the discretion of our board of directors, we will consider paying dividends in the future as our operational circumstances may permit, having regard to, among other things, our earnings, cash flow and financial requirements. It is the current policy of our board of directors to retain all earnings to finance our business plan.

Description of Warrants

The following description of the terms of warrants provides some general terms and provisions of warrants in respect of which a prospectus supplement may be filed. This summary is not complete. The particular terms and provisions of warrants offered by any prospectus supplement, and the extent to which the general terms and provisions described below may apply to them, will be described in the applicable prospectus supplement. Warrants may be offered separately or in combination with common shares.

The description of general terms and provisions of warrants described in any prospectus supplement will include, but is not limited to, where applicable:

- the designation and aggregate number of warrants offered;
- the price at which the warrants will be offered;
- the currency or currencies in which the warrants are denominated;
- the number of common shares that may be purchased on the exercise of the warrants and conditions and procedures that will result in an adjustment of that number;
- the exercise price of the warrants and the dates or periods during which the warrants are exercisable;
- any minimum or maximum amount of warrants that may be exercised at any one time;
- any terms, procedures and limitations relating to the transferability, exchange or exercise of the warrants; and
- any other material terms of the warrants.

If the warrants are issued pursuant to warrant agreements or warrant indentures, we will so specify in the prospectus supplement relating to the warrants being offered pursuant to the prospectus supplement. We will file any warrant agreement or warrant indenture with the SEC and incorporate them by reference as an exhibit to the registration statement of which this prospectus is a part, on or before the time we issue a series of warrants.

Each warrant will entitle the holder to acquire such number of common shares at such exercise price and in accordance with such terms as shall in each case be set forth in, or be determinable as set forth in, the prospectus supplement relating to the warrants offered by the prospectus supplement. Warrants may be exercised at any time up to the close of business on the expiration date set forth in the prospectus supplement relating to the warrants offered thereby. After the close of business on the expiration date, unexercised warrants will become void.

The warrants may be exercised as set forth in the prospectus supplement relating to the warrants offered thereby. Upon receipt of payment and the taking of other action specified in the applicable prospectus supplement, we will, as soon as practicable, forward the securities purchasable upon exercise. If less than all of the warrants represented by such warrant certificate are exercised, a new warrant certificate will be issued for the remaining warrants.

Before the exercise of their warrants, holders of warrants will not have any of the rights of holders of common shares. Therefore, holders of warrants will not be entitled, by virtue of being such holders, to vote, consent, receive dividends, receive notice as shareholders with respect to any meeting of shareholders for the election of our directors or any other matter, or to exercise any rights whatsoever as our shareholders. We reserve the right to include in a prospectus supplement specific terms of the warrants that are not within the options and parameters described in this prospectus. In addition, to the extent that any particular terms of the warrants described in a prospectus supplement differ from any of the terms described in this prospectus, the description of those terms included in this prospectus shall be deemed to have been superseded by the description of the differing terms set forth in such prospectus supplement with respect to such warrants.

Description of Units

We may issue units comprised of one or more of the securities described in this prospectus in any combination. Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement, if any, under which a unit is issued may provide that the securities comprising the unit may not be held or transferred separately, at any time or at any time before a specified date.

The particular terms and provisions of units offered by any prospectus supplement, and the extent to which the general terms and provisions described below may apply thereto, will be described in the prospectus supplement filed in respect of such units. This description will include, where applicable:

- the designation and aggregate number of units offered;
- the price at which the units will be offered;
- the currency or currencies in which the units are denominated;
- the terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately;
- the number of securities that may be purchased upon exercise of each unit and the price at which the currency or currencies in which that amount of securities may be purchased upon exercise of each unit;
- any provisions for the issuance, payment, settlement, transfer, adjustment or exchange of the units or of the securities comprising the units; and
- any other material terms of the units.

We reserve the right to set forth in a prospectus supplement specific terms of the units that are not within the options and parameters set forth in this prospectus. In addition, to the extent that any particular terms of the units described in a prospectus supplement differ from any of the terms described in this prospectus, the description of such terms set forth in this prospectus shall be deemed to have been superseded by the description of the differing terms set forth in such prospectus supplement with respect to such units.

GLOBAL SECURITIES

Book-Entry, Delivery and Form

Unless we indicate differently in any applicable prospectus supplement or free writing prospectus, the securities initially will be issued in book-entry form and represented by one or more global notes or global securities, or, collectively, global securities. The global securities will be deposited with, or on behalf of, The Depository Trust Company, New York, New York, or DTC, as depository, and registered in the name of Cede & Co., the nominee of DTC. Unless and until it is exchanged for individual certificates evidencing securities under the limited circumstances described below, a global security may not be transferred except as a whole by the depository to its nominee or by the nominee to the depository, or by the depository or its nominee to a successor depository or to a nominee of the successor depository.

DTC has advised us that it is:

- a limited-purpose trust company organized under the New York Banking Law;
- a “banking organization” within the meaning of the New York Banking Law;
- a member of the Federal Reserve System;
- a “clearing corporation” within the meaning of the New York Uniform Commercial Code; and
- a “clearing agency” registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934.

DTC holds securities that its participants deposit with DTC. DTC also facilitates the settlement among its participants of securities transactions, such as transfers and pledges, in deposited securities through electronic computerized book-entry changes in participants’ accounts, thereby eliminating the need for physical movement of securities certificates. “Direct participants” in DTC include securities brokers and dealers, including underwriters, banks, trust companies, clearing corporations and other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation, or DTCC. DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others, which we sometimes refer to as indirect participants, that clear through or maintain a custodial relationship with a direct participant, either directly or indirectly. The rules applicable to DTC and its participants are on file with the SEC.

Purchases of securities under the DTC system must be made by or through direct participants, which will receive a credit for the securities on DTC's records. The ownership interest of the actual purchaser of a security, which we sometimes refer to as a beneficial owner, is in turn recorded on the direct and indirect participants' records. Beneficial owners of securities will not receive written confirmation from DTC of their purchases. However, beneficial owners are expected to receive written confirmations providing details of their transactions, as well as periodic statements of their holdings, from the direct or indirect participants through which they purchased securities. Transfers of ownership interests in global securities are to be accomplished by entries made on the books of participants acting on behalf of beneficial owners. Beneficial owners will not receive certificates representing their ownership interests in the global securities, except under the limited circumstances described below.

To facilitate subsequent transfers, all global securities deposited by direct participants with DTC will be registered in the name of DTC's partnership nominee, Cede & Co., or such other name as may be requested by an authorized representative of DTC. The deposit of securities with DTC and their registration in the name of Cede & Co. or such other nominee will not change the beneficial ownership of the securities. DTC has no knowledge of the actual beneficial owners of the securities. DTC's records reflect only the identity of the direct participants to whose accounts the securities are credited, which may or may not be the beneficial owners. The participants are responsible for keeping account of their holdings on behalf of their customers.

So long as the securities are in book-entry form, you will receive payments and may transfer securities only through the facilities of the depository and its direct and indirect participants. We will maintain an office or agency in the location specified in the prospectus supplement for the applicable securities, where notices and demands in respect of the securities and the indenture may be delivered to us and where certificated securities may be surrendered for payment, registration of transfer or exchange.

Conveyance of notices and other communications by DTC to direct participants, by direct participants to indirect participants and by direct participants and indirect participants to beneficial owners will be governed by arrangements among them, subject to any legal requirements in effect from time to time.

Redemption notices will be sent to DTC. If less than all of the securities of a particular series are being redeemed, DTC's practice is to determine by lot the amount of the interest of each direct participant in the securities of such series to be redeemed.

Neither DTC nor Cede & Co. (or such other DTC nominee) will consent or vote with respect to the securities. Under its usual procedures, DTC will mail an omnibus proxy to us as soon as possible after the record date. The omnibus proxy assigns the consenting or voting rights of Cede & Co. to those direct participants to whose accounts the securities of such series are credited on the record date, identified in a listing attached to the omnibus proxy.

So long as securities are in book-entry form, we will make payments on those securities to the depository or its nominee, as the registered owner of such securities, by wire transfer of immediately available funds. If securities are issued in definitive certificated form under the limited circumstances described below and unless if otherwise provided in the description of the applicable securities herein or in the applicable prospectus supplement, we will have the option of making payments by check mailed to the addresses of the persons entitled to payment or by wire transfer to bank accounts in the United States designated in writing to the applicable trustee or other designated party at least 15 days before the applicable payment date by the persons entitled to payment, unless a shorter period is satisfactory to the applicable trustee or other designated party.

Redemption proceeds, distributions and dividend payments on the securities will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit direct participants' accounts upon DTC's receipt of funds and corresponding detail information from us on the payment date in accordance with their respective holdings shown on DTC records. Payments by participants to beneficial owners will be governed by standing instructions and customary practices, as is the case with securities held for the account of customers in bearer form or registered in "street name." Those payments will be the responsibility of participants and not of DTC or us, subject to any statutory or regulatory requirements in effect from time to time. Payment of redemption proceeds, distributions and dividend payments to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC, is our responsibility, disbursement of payments to direct participants is the responsibility of DTC, and disbursement of payments to the beneficial owners is the responsibility of direct and indirect participants.

Except under the limited circumstances described below, purchasers of securities will not be entitled to have securities registered in their names and will not receive physical delivery of securities. Accordingly, each beneficial owner must rely on the procedures of DTC and its participants to exercise any rights under the securities and the indenture.

The laws of some jurisdictions may require that some purchasers of securities take physical delivery of securities in definitive form. Those laws may impair the ability to transfer or pledge beneficial interests in securities.

DTC may discontinue providing its services as securities depository with respect to the securities at any time by giving reasonable notice to us. Under such circumstances, in the event that a successor depository is not obtained, securities certificates are required to be printed and delivered.

As noted above, beneficial owners of a particular series of securities generally will not receive certificates representing their ownership interests in those securities. However, if:

- DTC notifies us that it is unwilling or unable to continue as a depository for the global security or securities representing such series of securities or if DTC ceases to be a clearing agency registered under the Exchange Act at a time when it is required to be registered and a successor depository is not appointed within 90 days of the notification to us or of our becoming aware of DTC's ceasing to be so registered, as the case may be;
- we determine, in our sole discretion, not to have such securities represented by one or more global securities; or
- an event of default has occurred and is continuing with respect to such series of securities,

we will prepare and deliver certificates for such securities in exchange for beneficial interests in the global securities. Any beneficial interest in a global security that is exchangeable under the circumstances described in the preceding sentence will be exchangeable for securities in definitive certificated form registered in the names that the depository directs. It is expected that these directions will be based upon directions received by the depository from its participants with respect to ownership of beneficial interests in the global securities.

Euroclear, Clearstream and CDS

If so provided in the applicable prospectus supplement, you may hold interests in a global security through the Canadian Depository for Securities, which we refer to as "CDS", Clearstream Banking S.A., which we refer to as "Clearstream," or Euroclear Bank S.A./N.V., as operator of the Euroclear System, which we refer to as "Euroclear," either directly if you are a participant in CDS, Clearstream or Euroclear or indirectly through organizations which are participants in CDS, Clearstream or Euroclear. CDS, Clearstream and Euroclear will hold interests on behalf of their respective participants through customers' securities accounts in the names of CDS, Clearstream and Euroclear, respectively, on the books of their respective U.S. depositories (if applicable), which in turn will hold such interests in customers' securities accounts in such depositories' names on DTC's books.

CDS, Clearstream and Euroclear are securities clearance systems in Canada (CDS) and Europe (Clearstream and Euroclear). CDS, Clearstream and Euroclear hold securities for their respective participating organizations and facilitate the clearance and settlement of securities transactions between those participants through electronic book-entry changes in their accounts, thereby eliminating the need for physical movement of certificates.

Payments, deliveries, transfers, exchanges, notices and other matters relating to beneficial interests in global securities owned through CDS, Euroclear or Clearstream must comply with the rules and procedures of those systems. Transactions between participants in CDS, Euroclear or Clearstream, on one hand, and other participants in DTC, on the other hand, are also subject to DTC's rules and procedures.

Investors will be able to make and receive through CDS, Euroclear and Clearstream payments, deliveries, transfers and other transactions involving any beneficial interests in global securities held through those systems only on days when those systems are open for business. Those systems may not be open for business on days when banks, brokers and other institutions are open for business in the United States.

Cross-market transfers between participants in DTC, on the one hand, and participants in CDS, Euroclear or Clearstream, on the other hand, will be effected through DTC in accordance with the DTC's rules on behalf of CDS, Euroclear or Clearstream, as the case may be, by their respective U.S. depositories (if applicable); however, such cross-market transactions will require delivery of instructions to CDS, Euroclear or Clearstream, as the case may be, by the counterparty in such system in accordance with the rules and procedures and within the established deadlines (if applicable) of such system. CDS, Euroclear or Clearstream, as the case may be, will, if the transaction meets its settlement requirements and if applicable, deliver instructions to its U.S. depository to take action to effect final settlement on its behalf by delivering or receiving interests in the global securities through DTC, and making or receiving payment in accordance with normal procedures for same-day fund settlement. If applicable, participants in CDS, Euroclear or Clearstream may not deliver instructions directly to their respective U.S. depositories.

Due to time zone differences, the securities accounts of a participant in Euroclear or Clearstream purchasing an interest in a global security from a direct participant in DTC will be credited, and any such crediting will be reported to the relevant participant in Euroclear or Clearstream, during the securities settlement processing day (which must be a business day for Euroclear or Clearstream) immediately following the settlement date of DTC. Cash received in Euroclear or Clearstream as a result of sales of interests in a global security by or through a participant in Euroclear or Clearstream to a direct participant in DTC will be received with value on the settlement date of DTC but will be available in the relevant Euroclear or Clearstream cash account only as of the business day for Euroclear or Clearstream following DTC's settlement date.

Other

The information in this section of this prospectus concerning DTC, CDS, Clearstream, Euroclear and their respective book-entry systems has been obtained from sources that we believe to be reliable, but we do not take responsibility for this information. This information has been provided solely as a matter of convenience. The rules and procedures of DTC, CDS, Clearstream and Euroclear are solely within the control of those organizations and could change at any time. Neither we nor the trustee nor any agent of ours or of the trustee has any control over those entities and none of us takes any responsibility for their activities. You are urged to contact DTC, CDS, Clearstream and Euroclear or their respective participants directly to discuss those matters. In addition, although we expect that DTC, CDS, Clearstream and Euroclear will perform the foregoing procedures, none of them is under any obligation to perform or continue to perform such procedures and such procedures may be discontinued at any time. Neither we nor any agent of ours will have any responsibility for the performance or nonperformance by DTC, CDS, Clearstream and Euroclear or their respective participants of these or any other rules or procedures governing their respective operations.

PLAN OF DISTRIBUTION

We may sell securities to or through underwriters or dealers, and also may sell securities to one or more other purchasers directly or through agents, including sales pursuant to ordinary brokerage transactions and transactions in which a broker-dealer solicits purchasers. Underwriters may sell securities to or through dealers. Each prospectus supplement for a particular offering of securities will set forth the terms of the offering, including:

- the name or names of any underwriters, dealers, or agents;
- the purchase price of, and form of consideration for, the securities and the proceeds to us;
- any delayed delivery arrangements;
- any underwriting commissions, fees, discounts and other items constituting underwriters' compensation;
- the offering price for the securities (or the manner of determination of the offering price if offered on a non-fixed price basis);
- any discounts or concessions allowed or re-allowed or paid to dealers;
- the expected delivery date of the sale of the offered securities; and
- any securities exchanges on which the securities may be listed.

The securities may be sold, from time to time, in one or more transactions at a fixed price or prices that may be changed or at market prices prevailing at the time of sale, at prices related to such prevailing market prices, at varying prices determined at the time of sale, or at negotiated prices, including sales made directly on NASDAQ or other existing trading markets for the securities. We may engage in at-the-market offerings of our securities. The prices at which the securities may be offered may vary as between purchasers and during the period of distribution. If, in connection with the offering of securities at a fixed price or prices, the underwriters have made a *bona fide* effort to sell all of the securities at the initial offering price fixed in the applicable prospectus supplement, the public offering price may be decreased and thereafter further changed, from time to time, to an amount not greater than the initial public offering price fixed in such prospectus supplement, in which case the compensation realized by the underwriters will be decreased by the amount that the aggregate price paid by purchasers for the securities is less than the gross proceeds paid by the underwriters to us.

Underwriters, dealers and agents who participate in the distribution of the securities may be entitled under agreements to be entered into with us to indemnification by us against certain liabilities, including liabilities under the Securities Act of 1933, or to contribution with respect to payments that such underwriters, dealers or agents may be required to make in respect thereof. Such underwriters, dealers and agents may be customers of, engage in transactions with, or perform services for us in the ordinary course of business.

In connection with any offering of securities, other than an at-the-market offering, the underwriters may over-allot or effect transactions that stabilize or maintain the market price of the securities offered at a level above that which might otherwise prevail in the open market. Such transactions, if commenced, may be discontinued at any time.

MATERIAL INCOME TAX CONSIDERATIONS

The applicable prospectus supplement may describe material U.S. federal income tax consequences of the acquisition, ownership and disposition of any of the securities offered by this prospectus by an investor who is subject to U.S. federal taxation.

The applicable prospectus supplement may also describe material Canadian federal income tax considerations generally applicable to investors described therein of purchasing, holding and disposing of the applicable securities, including, in the case of an investor who is not a resident of Canada, Canadian non-resident withholding tax considerations.

LEGAL MATTERS

Unless otherwise specified in a prospectus supplement, certain legal matters relating to the securities will be passed upon for us by Dorsey & Whitney LLP, Vancouver, B.C., and Seattle, Washington, with respect to matters of United States law, and McCarthy Tétrault LLP, Toronto, Ontario, with respect to matters of Canadian law.

EXPERTS

Our consolidated financial statements as of December 31, 2018 and December 31, 2017 and for each of the years in the two-year period ended December 31, 2018, have been audited by KPMG LLP as set forth in their reports thereon and incorporated herein by reference.

Such consolidated financial statements have been incorporated by reference herein in reliance upon the report of KPMG LLP, and upon the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We are subject to the information requirements of the Exchange Act and, accordingly, we file reports with and furnish other information to the SEC. We have filed with the SEC a registration statement on Form S-3 under the Securities Act of 1933 with respect to the securities offered by this prospectus. This prospectus does not contain all of the information contained in the registration statement that we filed. For further information regarding us and the securities covered by this prospectus, you may desire to review the full registration statement, including its exhibits. The registration statement, including its exhibits, as well as the documents that we file with the SEC, may be inspected and copied at the public reference facilities maintained by the SEC at 100 F Street, N.E., Room 1580, Washington, D.C. 20549. You may obtain information on the operation of the public reference room by calling 1-800-SEC-0330. Copies of such materials are also available by mail from the Public Reference Branch of the SEC at 100 F Street, N.E., Washington, D.C. 20549 at prescribed rates. In addition, the SEC maintains a website (<http://www.sec.gov>) from which interested persons can electronically access the registration statement, including the exhibits to the registration statement.

INCORPORATION BY REFERENCE

The SEC allows us to “incorporate by reference” information we file with the SEC. This means that we can disclose important information to you by referring you to those documents.

We incorporate by reference into this prospectus the documents listed below:

- (a) our Annual Report on Form 10-K for the year ended December 31, 2018, filed with the SEC on March 12, 2019;
- (b) all other reports filed by us pursuant to Section 13(a) or 15(d) of the Exchange Act since December 31, 2018; and
- (c) the description of our common shares set forth under the heading “Additional Information – Common Shares” contained in our Annual Report on Form 20-F for the fiscal year end May 31, 2014, filed with the SEC on July 30, 2014, and incorporated by reference into our Registration Statement on Form 8-A, as filed with the SEC on October 21, 2014, including any amendment or report to such Registration Statement on Form 8-A filed for the purpose of amending such description.

In addition, all documents filed by us under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, after the date of this prospectus but before the termination of the offering of the securities covered by this prospectus, are hereby incorporated by reference into this prospectus.

We have not authorized anyone to provide you with any different or additional information other than that contained in or incorporated by reference into this prospectus. We take no responsibility for, and can provide no assurance as to the reliability of, any information that others may provide.

Any statement contained in a document incorporated or deemed to be incorporated by reference into this prospectus will be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus or any other subsequently filed document that is deemed to be incorporated by reference into this prospectus modifies or supersedes the statement. Any statement so modified or superseded will not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

The documents incorporated by reference into this prospectus are available from us upon request. We will provide a copy of any and all of the information that is incorporated by reference into this prospectus to any person, including a beneficial owner, to whom a prospectus is delivered, without charge, upon written or oral request. If exhibits to the documents incorporated by reference into this prospectus are not themselves specifically incorporated by reference in this prospectus, then the exhibits will not be provided.

Requests for any of these documents should be directed to:

Investor Relations
Aptose Biosciences Inc.
251 Consumers Road, Suite 1105
Toronto, Ontario, Canada M2J 4R3
(647) 479-9828

PART II

INFORMATION NOT REQUIRED IN THE PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution

The following table sets forth the estimated costs and expenses, other than underwriting discounts and commissions, payable by the registrant in connection with the offering of the Securities being registered. All the amounts shown are estimates, except for the Securities and Exchange Commission registration fee. The amounts do not include the costs of preparing any prospectus supplements, stock exchange listing fees, FINRA filing fees, transfer agent fees or other expenses relating to the sale and distribution of particular securities registered under this registration statement, as those costs and expenses cannot be estimated at this time.

| | Amount |
|---|------------------|
| Securities and Exchange Commission registration fee | \$ 12,120 |
| Accounting fees and expenses | 15,000 |
| Legal fees and expenses | 30,000 |
| Miscellaneous fees and expenses | 5,000 |
| Total | \$ 62,120 |

Item 15. Indemnification of Officers and Directors

Under the *Canada Business Corporations Act*, or the "CBCA", the registrant may indemnify its current or former directors or officers or another individual who acts or acted at the registrant's request as a director or officer, or an individual acting in a similar capacity, of another entity, against all costs, charges and expenses, including an amount paid to settle an action or satisfy a judgment, reasonably incurred by the individual in respect of any civil, criminal, administrative, investigative or other proceeding in which the individual is involved because of his or her association with the registrant or another entity, and the individual seeking indemnity shall have a right to such indemnity if such individual was not judged by the court or other competent authority to have committed any fault or omitted to do anything that such individual ought to have done. The CBCA also provides that the registrant may advance moneys to such an individual for the costs, charges and expenses of such a proceeding.

The CBCA also provides that the registrant may with the approval of a court, indemnify such an individual or advance moneys against all costs, charges and expenses reasonably incurred by the individual in connection with an action by or on behalf of the registrant or other entity to procure a judgment in its favour, to which the individual is made a party because of the individual's association with the registrant or other entity at the registrant's request.

However, indemnification under any of the foregoing circumstances is prohibited under the CBCA unless the individual:

- acted honestly and in good faith with a view to the registrant's best interests, or the best interests of the other entity for which the individual acted as director or officer or in a similar capacity at the registrant's request; and
- in the case of a criminal or administrative action or proceeding that is enforced by a monetary penalty, the individual had reasonable grounds for believing that his or her conduct was lawful.

The registrant's by-law No. 2 provides that the registrant will indemnify its directors or officers, former directors or officers or other individuals who act or have acted at the registrant's request as a director or officer, or in a similar capacity, of another entity, and his or her heirs and legal representatives to the extent permitted by the CBCA.

The registrant's by-law No. 2 further provides that, except as otherwise required by the CBCA, the registrant may from time to time indemnify and save harmless any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the registrant) by reason of the fact that he or she is or was an employee or agent of the registrant, or is or was serving at the request of the registrant as an employee, agent of or participant in another entity against expenses (including legal fees), judgments, fines and any amount actually and reasonably incurred by him or her in connection with such action, suit or proceeding if he or she acted honestly and in good faith with a view to the best interests of the registrant or, as the case may be, to the best interests of the other entity for which he or she served at the registrant's request and, with respect to any criminal or administrative action or proceeding that is enforced by a monetary penalty, had reasonable grounds for believing that his or her conduct was lawful. The termination of any action, suit or proceeding by judgment, order, settlement or conviction will not, of itself, create a presumption that the person did not act honestly and in good faith with a view to the best interests of the registrant or other entity and, with respect to any criminal or administrative action or proceeding that is enforced by a monetary penalty, had no reasonable grounds for believing that his or her conduct was lawful.

The registrant has entered into indemnity agreements with its directors and certain officers pursuant to which it has agreed to indemnify its officers and directors for:

- (a) all costs, charges and expenses, including an amount paid to settle an action or satisfy a judgment, reasonably incurred by them in respect of any civil, criminal or administrative action or proceeding to which they are made a party by reason of being or having been a director and/or officer of the registrant, if (i) they acted honestly and in good faith with a view to the best interests of the registrant, and (ii) in the case of a criminal or administrative action or proceeding that is enforced by a monetary penalty, they had reasonable grounds for believing that their conduct was lawful.
- (b) all costs, charges and expenses reasonably incurred by them in connection with any action by or on behalf of the registrant to procure a judgment in the registrant's favour to which they are made a party by reason of being or having been a director and/or officer of the registrant.
- (c) all costs, charges and expenses reasonably incurred by them in connection with the defense of any civil, criminal or administrative proceeding to which they are made a party by reason of being or having been a director and/or officer of the registrant if they have been substantially successful on the merits in their defense of the action or proceeding and they fulfil the conditions set forth in the two foregoing clauses (a)(i) and (a)(ii) above.

Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers or persons controlling the registrant pursuant to the foregoing provisions, the registrant has been informed that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act of 1933 and is therefore unenforceable.

Item 16. Exhibits

| Exhibit Number | Description of Document |
|----------------------|--|
| 1.1* | Form of Underwriting Agreement |
| 3.1 | Articles of Incorporation, Arrangement and Amendment (incorporated herein by reference to Exhibit 99.3 to the registrant's Current Report on Form 6-K filed with the SEC on June 12, 2015) |
| 3.2 | By-law #2 of the registrant (incorporated herein by reference to Exhibit 99.2 to the registrant's Current Report on Form 6-K filed with the SEC on June 12, 2015) |
| 4.1* | Form of any Warrant Agreement or Warrant Indenture |
| 5.1 | Opinion of McCarthy Tétrault LLP |
| 23.1 | Consent of KPMG LLP |
| 23.2 | Consent of McCarthy Tétrault LLP (included in Exhibit 5.1) |
| 24.1 | Powers of Attorney (included on signature page to the registration statement) |

* To be filed by amendment or as an exhibit to a report pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and incorporated herein by reference.

Item 17. Undertakings

The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement;

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

provided, however, that the undertakings set forth in paragraphs (1)(i), (1)(ii) and (1)(iii) above do not apply if the registration statement is on Form S-3 or Form F-3 and the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statements or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act, to any purchaser:

(i) If the registrant is relying on Rule 430B:

(A) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(B) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act, shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof. Provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date; or

(ii) If the registrant is subject to Rule 430C, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

(5) That, for the purpose of determining liability of the registrant under the Securities Act, to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser: (i) any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424; (ii) any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant; (iii) the portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and (iv) any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(6) That, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(7) Insofar as indemnification for liabilities arising under the Securities Act, may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act, and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act, and will be governed by the final adjudication of such issue.

(8) That:

(i) for purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b) (1) or (4) or 497(h) under the Securities Act, shall be deemed to be part of this registration statement as of the time it was declared effective.

(ii) for the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized in the City of San Diego, California, on this 12th day of March, 2019.

APTOSE BIOSCIENCES INC.

By: /s/ Gregory K. Chow

Name: Gregory K. Chow

Title: Senior Vice President and Chief Financial Officer

POWERS OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints William G. Rice and Gregory K. Chow, and each of them, his or her true and lawful attorneys-in-fact and agents, each acting alone, with the powers of substitution and revocation, for him or her and in his or her name, place and stead, in any and all capacities, to sign this registration statement on Form S-3, and any and all amendments (including post-effective amendments) thereto, and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto such attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming that all such attorneys-in-fact and agents or any of them, or their substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement on Form S-3 has been signed by the following persons in the capacities indicated below on March 12, 2019.

| <u>Signature</u> | <u>Title</u> |
|---|--|
| <u>/s/ William G. Rice</u> William G. Rice | President, Chief Executive Officer and Chairman of the Board of Directors (Principal Executive Officer) |
| <u>/s/ Gregory K. Chow</u> Gregory K. Chow | Senior Vice President and Chief Financial Officer (Principal Financial Officer and Accounting Officer) |
| <u>/s/ Denis Burger</u> Denis Burger | Director |
| <u>/s/ Carol Ashe</u> Carol Ashe | Director |
| <u>/s/ Caroline Loewy</u> Caroline Loewy | Director |
| <u>/s/ Erich M. Platzer</u> Dr. Erich M. Platzer | Director |
| <u>/s/ Mark Vincent</u> Dr. Mark Vincent | Director |
| <u>/s/ Warren Whitehead</u> Warren Whitehead | Director |

AUTHORIZED REPRESENTATIVE

Pursuant to the requirements of Section 6(a) of the Securities Act of 1933, the undersigned has signed this registration statement, solely in the capacity of the duly authorized representative of Aptose Biosciences Inc. in the United States, on this 12th day of March, 2019.

APTOSE BIOSCIENCES INC.

By: /s/ Gregory K. Chow
Name: Gregory K. Chow
Title: Senior Vice President and Chief Financial Officer

EXHIBIT INDEX

| Exhibit Number | Description of Document |
|-----------------------------|---|
| 1.1* | Form of Underwriting Agreement |
| <u>3.1</u> | <u>Articles of Incorporation, Arrangement and Amendment (incorporated herein by reference to Exhibit 99.3 to the registrant's Current Report on Form 6-K filed with the SEC on June 12, 2015)</u> |
| <u>3.2</u> | <u>By-law #2 of the registrant (incorporated herein by reference to Exhibit 99.2 to the registrant's Current Report on Form 6-K filed with the SEC on June 12, 2015)</u> |
| 4.1* | Form of any Warrant Agreement or Warrant Indenture |
| <u>5.1</u> | <u>Opinion of McCarthy Tétrault LLP</u> |
| <u>23.1</u> | <u>Consent of KPMG LLP</u> |
| <u>23.2</u> | <u>Consent of McCarthy Tétrault LLP (included in Exhibit 5.1)</u> |
| <u>24.1</u> | <u>Powers of Attorney (included on signature page to the registration statement)</u> |

* To be filed by amendment or as an exhibit to a report pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and incorporated herein by reference.

McCarthy Tétrault LLP
Box 48, Suite 5300
Toronto Dominion Bank Tower
Toronto, ON M5K 1E6
Canada

Tel: 416-382-1812
Fax: 416-868-0673



March 12, 2019

Aptose Biosciences Inc.
251 Consumers Road, Suite 1105
Toronto, Ontario M2J 4R3

Dear Sirs:

**Re: Aptose Biosciences Inc.
Registration Statement on Form S-3**

We have acted as Canadian counsel to Aptose Biosciences Inc. (the “**Company**”) in connection with the preparation and filing with the United States Securities and Exchange Commission (the “**Commission**”) under the United States Securities Act of 1933, as amended (the “**Securities Act**”), of the Company’s Registration Statement on Form S-3 to be filed on the date hereof (the “**Registration Statement**”), relating to offers and sales from time to time of up to US\$100,000,000 of the Company’s common shares (the “**Common Shares**”), warrants to purchase Common Shares (the “**Warrants**”) and units that may be comprised of a combination of Common Shares and Warrants (the “**Units**”) and, collectively with the Common Shares and Warrants, the “**Offered Securities**”).

The Registration Statement includes a prospectus (the “**Prospectus**”), which provides that it will be supplemented in the future by one or more prospectus supplements (each a “**Prospectus Supplement**”). The Warrants may be issued pursuant to warrant agreements or warrant indentures (each a “**Warrant Indenture**”) to be entered into between the Company and one or more banks or trust companies acting as warrant agent and the Warrants may be represented by certificates (each a “**Warrant Certificate**”) and together with the Warrant Indenture, the “**Governing Warrant Documents**”). The Units may be issued pursuant to unit agreements (each a “**Unit Agreement**”).

In connection with this opinion, we have examined and relied upon originals or copies, certified or otherwise identified to our satisfaction, of:

- (a) the Registration Statement;
 - (b) the Company’s articles (the “**Articles**”), as in effect on the date hereof;
 - (c) the Company’s bylaws (together with the Articles, the “**Constituting Documents**”), as in effect on the date hereof; and
 - (d) a copy of the resolutions of the Company’s Board of Directors relating to the Registration Statement and other matters.
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We have also examined originals or copies, certified or otherwise identified to our satisfaction, of such records of the Company and such agreements, certificates of public officials, certificates of officers, or other representatives of the Company, and such other documents as we have deemed necessary or appropriate as a basis for the opinion set forth herein.

In our examination, we have assumed the legal capacity of all natural persons, the genuineness of all signatures, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as certified, conformed, photostatic, electronic, or facsimile copies and the authenticity of the originals of such documents. In making our examination of executed documents or documents which may be executed, we have assumed that the parties thereto, other than the Company, had or will have the power, corporate or other, to enter into and perform all obligations thereunder and have also assumed the due authorization by all requisite action, corporate or other, and execution and delivery by such parties, of such documents and that (except to the extent we have opined on such matters below) such documents constitute or will constitute valid and binding obligations of the parties thereto.

As to any facts material to the opinion expressed herein which we have not independently established or verified, we have relied upon statements and representations of officers and other representatives of the Company and others. We have also assumed that, at the time of issuance of any Offered Securities:

- (a) the Constatting Documents, and the Applicable Law (defined below) shall not have been amended so as to affect the validity of such issuance,
 - (b) the Registration Statement, as finally amended (including all necessary post-effective amendments), has become and remains effective under the Securities Act,
 - (c) an appropriate amended Prospectus or Prospectus Supplement with respect to the applicable Offered Securities has been prepared, delivered, and filed in compliance with the Securities Act and the applicable rules and regulations thereunder;
 - (d) all Offered Securities will be offered, issued and sold in compliance with applicable United States federal and state securities laws and in the manner stated in the Registration Statement, the Prospectus and the appropriate Prospectus Supplement;
 - (e) the Offered Securities are issued in accordance with the terms of their governing instruments;
 - (f) any applicable Governing Warrant Document or Unit Agreement will have been duly authorized, executed and delivered by the Company and the other parties thereto, as applicable, and constitutes legally valid and binding obligations of the parties thereto, enforceable against each of them in accordance with its terms;
 - (g) any Governing Warrant Document or any Unit Agreement is governed by Ontario law; and
 - (h) if the Offered Securities are to be sold pursuant to a brokered offering, the underwriting, purchase or agency agreement with respect to the applicable Offered Securities will have been duly authorized, executed and delivered by the Company and the other parties thereto, and is a legally valid and binding obligation of the parties thereto.
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The opinions expressed herein are limited to the laws of the Province of Ontario and the federal laws of Canada applicable therein (the “**Applicable Law**”).

Based and relying upon and subject to the foregoing, we are of the opinion that:

1. With respect to any Common Shares which may be offered pursuant to the Registration Statement or any Common Shares issuable upon the exercise of Warrants which may be offered or otherwise issued pursuant to the Registration Statement (the “**Offered Common Shares**”), when
 - (a) the issuance and sale of the Offered Common Shares have been duly authorized by all necessary corporate action in conformity with the Constatting Documents (as then in effect), and the *Canada Business Corporations Act* (the “**CBCA**”) (as then in effect), and do not violate any Applicable Law or result in a default under or breach of any agreement or instrument binding upon the Company or any of its subsidiaries and comply with any requirement or restriction imposed by any court or governmental body of Canada or Ontario having jurisdiction over the Company or any of its subsidiaries;
 - (b) the full consideration, determined to be adequate by the Company’s Board of Directors (or a duly authorized committee thereto), or as provided pursuant to Governing Warrant Documents, as the case may be, has been received by the Company; and
 - (c) if certificated, the certificates representing the Offered Common Shares have been duly executed and delivered by the proper officers of the Company to the purchasers thereof against payment of the agreed-upon consideration therefor in the manner contemplated in the Registration Statement or any Prospectus Supplement relating thereto,the Offered Common Shares will be validly issued, fully paid, and non-assessable.
 2. With respect to any Warrants which may be offered pursuant to the Registration Statement or any Warrants issuable upon exercise or conversion of Units which may be offered pursuant to the Registration Statement (the “**Offered Warrants**”), when
 - (a) the terms, issuance, and sale of the Offered Warrants and the performance under the Governing Warrant Documents, the issuance of the Common Shares upon the exercise of the Offered Warrants, and the Governing Warrant Documents have been duly authorized by all necessary corporate action, including the authorization of the issuance and reservation (if appropriate) of the Common Shares to be issued pursuant to the Offered Warrants, in conformity with the Constatting Documents (as then in effect), and the CBCA (as then in effect), and provided the issuance and sale does not violate any Applicable Law or result in a default under or breach of any agreement or instrument binding upon the Corporation or any of its subsidiaries and comply with any requirement or restriction imposed by any court or governmental body of Canada or Ontario having jurisdiction over the Company or any of its subsidiaries;
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- (b) the full consideration, determined to be adequate by the Company's Board of Directors (or a duly authorized committee thereto), for the Offered Warrants has been received by the Company;
- (c) if certificated, the Warrant Certificates representing the Offered Warrants have been duly executed, countersigned (if required), issued, and delivered in accordance with the terms of the Warrant Indenture, if any, to the purchasers thereof against payment of the agreed-upon consideration therefor in the manner contemplated in the Registration Statement or any Prospectus Supplement relating thereto; and
- (d) the Warrant Indenture, if any, relating to the Offered Warrants and the underlying Common Shares have been duly authorized, executed, and delivered by the Company,

the Offered Warrants will be validly issued, and the Offered Warrants, Warrant Indenture, if any, and the Warrant Certificates, if any, will be valid and binding obligations of the Company, enforceable against the Company in accordance with their terms.

3. With respect to any Units which may be offered pursuant to the Registration Statement (the "**Offered Units**"), when

- (a) the terms, issuance and sale of the Offered Units, and performance under the Unit Agreement, if any, have been duly authorized by all necessary corporate action, including the authorization of the issuance and reservation (if appropriate) of the Common Shares or Warrants to be issued pursuant to the Offered Units, as well as the Common Shares which may be issuable upon exercise of such Warrants, in conformity with the Constatting Documents (as then in effect), and the CBCA (as then in effect), and provided the issuance and sale does not violate any Applicable Law or result in a default under or breach of any agreement or instrument binding upon the Company or any of its subsidiaries and comply with any requirement or restriction imposed by any court or governmental body of Canada or Ontario having jurisdiction over the Company or any of its subsidiaries;
 - (b) if certificated, the Warrant Certificates representing the Warrants to be issued as part of the Offered Units and, if certificated, the certificates representing the Common Shares to be issued as part of the Offered Units, have been duly executed, countersigned (if required) and delivered in accordance with the terms of the Unit Agreement, if any, to the purchasers thereof against payment of the agreed-upon consideration therefor in the manner contemplated in the Registration Statement or any Prospectus Supplement relating thereto;
 - (c) the full consideration, determined to be adequate by the Company's Board of Directors (or a duly authorized committee thereto), for the Offered Units has been received by the Company; and
 - (d) the Unit Agreement relating to the Offered Units, if any, has been duly authorized, executed, and delivered by the Company,
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the Offered Units will be validly issued and the Offered Units, Unit Agreement, if any, and the certificates representing Common Shares or Warrants, if any, will be valid and binding obligations of the Company; enforceable against the Company in accordance with their terms.

Insofar as our opinion in paragraphs 2 and 3 above relates to the legality, validity, binding nature or enforceability of the Warrant Certificate, Warrant Indenture, Offered Units and Unit Agreement, such opinion is subject to:

- (a) any applicable bankruptcy, insolvency, moratorium, arrangement, winding up laws or similar laws affecting the enforcement of creditors' rights generally including laws regarding limitations of action;
 - (b) general principles of equity, including the principle that the granting of equitable remedies such as specific performance and injunctive relief is within the discretion of a court of competent jurisdiction;
 - (c) the powers of a court of competent jurisdiction to grant relief from forfeiture, to stay proceedings before it and to stay execution on judgments;
 - (d) the qualification that the costs of and incidental to all proceedings authorized to be taken in court are in the discretion of the court and the court has full power to determine by whom and to what extent such costs shall be paid;
 - (e) the qualification that rights to indemnity and contribution may be limited by applicable law;
 - (f) the qualification that a court may require the discretionary powers expressed to be conferred on any party to such agreement or certificate to be exercised reasonably and in good faith notwithstanding any provisions to the contrary and may decline to accept as conclusive factual or legal determinations described as conclusive therein;
 - (g) the qualification that any provision in such agreement or certificate which purports to sever from such agreement or certificate, as the case may be, any provision therein which is prohibited or unenforceable under applicable law without affecting the validity of the remainder of the agreement or certificate, as the case may be, would be enforced only to the extent that the court determined that such prohibited or unenforceable provision could be severed without impairing the interpretation and application of the remainder of the agreement or certificate, as the case may be;
 - (h) the qualification that any provision in such agreement or certificate which purports to exculpate a party from liability or duty otherwise owed by it to another and certain remedial terms and waivers of equitable defences provided for in such agreement or certificate are limited by law; and
 - (i) the qualification as to the enforceability of any provision in such agreement or certificate which purports to contract out of, vary or exclude the provisions of the *Limitations Act, 2002* (Ontario).
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This opinion has been prepared for your use in connection with the Registration Statement and is expressed as of the date hereof. Our opinion is expressly limited to the matters set forth above and we render no opinion, whether by implication or otherwise, as to any other matters relating to the Company, the Prospectus, the Registration Statement or the Offered Securities.

We hereby consent to the filing of this opinion with the Commission as an exhibit to the Registration Statement. We also consent to the reference to our firm under the heading "Legal Matters" in the Registration Statement. In giving this consent, we do not thereby admit that we are in the category of persons whose consent is required under the Securities Act or the rules and regulations promulgated thereunder. This opinion is expressed as of the date hereof unless otherwise expressly stated, and we disclaim any undertaking to advise you of any subsequent changes of the facts stated or assumed herein or any subsequent changes in Applicable Law.

Yours very truly

/s/ McCarthy Tétrault LLP
McCarthy Tétrault LLP



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Consent of Independent Registered Public Accounting Firm

The Board of Directors

Aptose Biosciences Inc.

We, KPMG LLP, consent to the incorporation by reference in the registration statement on Form S-3 of Aptose Biosciences Inc. (the "Company") of our report dated March 12, 2019, with respect to the consolidated financial statements of Aptose Biosciences Inc. (the "Company"), which comprise the consolidated statements of financial position as at December 31, 2018 and December 31, 2017, the related consolidated statements of comprehensive loss and comprehensive loss, changes in shareholders' equity and cash flows for each of the years in the two-year period ended December 31, 2018, and the related notes (collectively, the "consolidated financial statements").

Our report dated March 12, 2019, contains an explanatory paragraph that states, without qualifying our opinion, that we draw attention to Note 2(a) and 15 to the consolidated financial statements, which indicates that the Company has retrospectively adopted United States generally accepted accounting principles (U.S. GAAP).

A handwritten signature in black ink that reads 'KPMG LLP' with a horizontal line underneath.

Chartered Professional Accountants, Licensed Public Accountants
March 12, 2019
Vaughan, Canada

KPMG LLP is a Canadian limited liability partnership and a member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity. KPMG Canada provides services to KPMG LLP.
