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

FORM 10-Q

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the Quarterly Period Ended March 31, 2019

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the Transition Period from to

Commission File Number: 1-35447

APTOSE BIOSCIENCES INC.

(Exact Name of Registrant as Specified in Its Charter)

Canada	**98-1136802**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)

251 Consumers Road, Suite 1105
Toronto, Ontario, Canada M2J 4R3
(Address of Principal Executive Offices)

647-479-9828
(Registrant's Telephone Number, Including Area Code)

Not applicable
(Former Name, Former Address and Former Fiscal Year, if Changed Since Last Report)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

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

Large accelerated filer ☐	Accelerated filer ☐	Non-accelerated filer ☒	Smaller reporting company ☒	Emerging growth company ☒

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.. ☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Shares, no par value	APTO	Nasdaq Capital Market

As of May 7, 2019, the registrant had 43,764,509 shares of common stock outstanding.

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PART I—FINANCIAL INFORMATION

ITEM 1 – FINANCIAL STATEMENTS

Condensed Consolidated Interim Financial Statements

(Unaudited)

APTOSE BIOSCIENCES INC.

For the three months ended March 31, 2019 and 2018

APTOSE BIOSCIENCES INC.

Condensed Consolidated Interim Statements of Financial Position (Expressed in thousands of US dollars) (unaudited)

		March 31, 2019		December 31, 2018
Assets				
Current assets:				
Cash and cash equivalents	$	16,581	$	15,299
Investments		449		440
Prepaid expenses		539		646
Other current assets		95		101
Total current assets		17,664		16,486
Non-current assets:				
Property and equipment		379		384
Right-of-use assets, operating leases		1,680		–
Total non-current assets		2,059		384
Total assets	$	19,723	$	16,870
Liabilities and Shareholders' Equity				
Current liabilities:				
Accounts payable	$	1,170	$	1,315
Accrued liabilities		1,322		1,474
Current portion of lease liability, operating leases		485		–
Total current liabilities		2,977		2,789
Non-current liabilities:				
Lease liability, operating leases		1,322		–
Total liabilities		4,299		2,789
Shareholders' equity:				
Share capital:				
Common shares, no par value, unlimited authorized shares, 41,499,112 and 38,161,808 shares issued and outstanding at March 31, 2019 and December 31, 2018, respectively		267,250		261,072
Additional paid-in capital		33,625		32,963
Accumulated other comprehensive loss		(4,307)		(4,316)
Deficit		(281,144)		(275,638)
Total shareholders' equity		15,424		14,081
Total liabilities and shareholders' equity	$	19,723	$	16,870

See accompanying notes to condensed consolidated interim financial statements (unaudited).

Subsequent events (note 12)

APTOSE BIOSCIENCES INC.
Condensed Consolidated Interim Statement of Loss and Comprehensive Loss
(Expressed in thousands of US dollars, except for per common share data)
(unaudited)

	Three months ended March 31, 2019	Three months ended March 31, 2018
Revenue	$ –	$ –
Expenses:		
Research and development	3,340	3,140
General and administrative	2,260	3,702
Operating Expenses	5,600	6,842
Other income (expense):		
Interest income	92	44
Foreign exchange gains/(losses)	2	(16)
Total other income	94	28
Net loss	(5,506)	(6,814)
Other comprehensive loss:		
Unrealized gain/(losses) on securities available-for-sale	9	(2)
Total comprehensive loss	$ (5,497)	$ (6,816)
Basic and diluted loss per common share	$ (0.14)	$ (0.23)
Weighted average number of common shares outstanding used in the calculation of (in thousands) Basic and diluted loss per common share	39,846	29,042

See accompanying notes to condensed consolidated interim financial statements (unaudited)

APTOSE BIOSCIENCES INC.
Condensed Consolidated Interim Statements of Changes in Shareholders' Equity
(Expressed in thousands of US dollars)
(unaudited)

	Common Shares		Additional paid-in capital	Accumulated other comprehensive loss	Deficit	Total
	Shares (thousands)	Amount				
Balance, December 31, 2018	38,162	$ 261,072	$ 32,963	$ (4,316)	$ (275,638)	$ 14,081
Common shares issued under the 2018 ATM	77	178				178
Common shares issued pursuant to 2018 share purchase agreement	3,260	6,000	–	–	–	6,000
Stock-based compensation	–	–	662	–	–	662
Other comprehensive loss	–	–	–	9	–	9
Net loss	–	–	–	–	(5,506)	(5,506)
Balance, March 31, 2019	41,499	267,250	33,625	(4,307)	(281,144)	15,424
Balance, December 31, 2017	27,502	$ 231,923	$ 29,365	$ (4,316)	$ (246,770)	$ 10,202
Common shares issued pursuant to 2017 share purchase agreement	3,200	8,855	–	–	–	8,855
Stock-based compensation	–	–	2,228	–	–	2,228
Other comprehensive loss	–	–	–	(2)	–	(2)
Net loss	–	–	–	–	(6,814)	(6,814)
Balance, March 31, 2018	30,702	$ 240,778	$ 31,593	$ (4,318)	$ (253,584)	$ 14,469

See accompanying notes to condensed consolidated interim financial statements (unaudited)

APTOSE BIOSCIENCES INC.
Condensed Consolidated Interim Statements of Cash Flows
(Expressed in thousands of US dollars)
(unaudited)

	Three months ended March 31, 2019	Three months ended March 31, 2018
Cash flows from operating activities:		
Net loss for the period	$ (5,506)	$ (6,814)
Items not involving cash:		
Stock-based compensation	662	2,228
Depreciation and amortization	29	16
Amortization of right-of-use assets	124	–
Interest on lease liabilities	24	–
Operating lease payments amortized to lease liabilities	(99)	–
Unrealized foreign exchange (gain)/loss	(2)	26
Change in non-cash operating working capital:		
Prepaid expenses	107	73
Other assets	6	(23)
Accounts payable	(145)	(227)
Accrued liabilities	(74)	667
Cash used in operating activities	(4,874)	(4,054)
Cash flows from financing activities:		
Issuance of common shares under 2017 share purchase agreement	–	8,860
Issuance of common shares under 2018 share purchase agreement	6,000	–
Issuance of common shares under the ATM, net of broker commission	178	–
Cost of offerings	–	(5)
Cash provided by financing activities	6,178	8,855
Cash flows from (used in) investing activities:		
Purchase of property and equipment	(24)	(24)
Cash provided by (used in) investing activities	(24)	(24)
Effect of exchange rate fluctuations on cash and cash equivalents held	2	–
Increase in cash and cash equivalents	1,282	4,777
Cash and cash equivalents, beginning of period	15,299	10,631
Cash and cash equivalents, end of period	$ 16,581	$ 15,408

See accompanying notes to condensed consolidated interim financial statements (unaudited)

1. Reporting entity:

Aptose Biosciences Inc. ("Aptose" or the "Company") is a clinical-stage biotechnology company committed to discovering and developing personalized therapies addressing unmet medical needs in oncology. The Company's executive offices are located in San Diego, California and its head office is located in Toronto, Canada.

Aptose has two clinical-stage programs and a second program that is discovery-stage and partnered with another company. CG026806 ("CG-806"), Aptose's pan-FMS-like tyrosine kinase 3 / pan-Bruton's tyrosine kinase inhibitor, was recently approved by the U.S. Food and Drug Administration (FDA) for a phase 1 safety trial for the treatment of patients with relapsed / refractory Acute Myeloid Leukemia (R/R AML) and patients having certain B-cell malignancies. APTO-253, Aptose's second program, is a small molecule MYC inhibitor and is currently enrolling patients in a Phase 1b clinical trial for the treatment of patients with R/R blood cancers, including AML and high-risk Myelodysplastic Syndrome.

2. Significant accounting policies

(a) Basis of consolidation:

These condensed consolidated interim financial statements include the accounts of its subsidiaries. All intercompany transactions, balances, revenue and expenses are eliminated on consolidation.

(b) Basis of presentation:

The accompanying unaudited condensed consolidated interim financial statements have been prepared in conformity with generally accepted accounting principles in the United States, or GAAP, for the interim financial information and the rules and regulations of the Securities and Exchange Commission, or SEC, related to quarterly reports on Form 10-Q. Accordingly, they do not include all of the information and disclosures required by GAAP for annual audited financial statements and should be read in conjunction with the Company's audited consolidated financial statements and notes thereto included in the Company's Annual Report on Form 10-K, or Annual Report, filed with the SEC on March 12, 2019. In the opinion of management, these condensed consolidated interim financial statements include all adjustments (consisting of normal recurring adjustments) necessary for a fair statement of the financial position, results of operations and cash flows for the periods presented. The results of operations for the interim periods shown in this report are not necessarily indicative of the results that may be expected for any future period, including the full year.

(c) Significant accounting policies, estimates and judgments:

During the three months ended March 31, 2019, there have been no changes to our significant accounting policies as described in our Annual Report on Form 10-K for the fiscal year ended December 31, 2018, except as described below for Lease accounting.

The preparation of the condensed consolidated interim financial statements requires management to make judgments, estimates and assumptions that affect the application of accounting policies and reported amounts of assets and liabilities at the date of the consolidated financial statements and reported amounts of revenue and expenses during the reporting period. Actual outcomes could differ from those estimates. The condensed consolidated interim financial statements include estimates, which, by their nature, are uncertain.

The impacts of such estimates are pervasive throughout the condensed consolidated interim financial statements and may require accounting adjustments based on future occurrences.

The estimates and underlying assumptions are reviewed on a regular basis. Revisions to accounting estimates are recognized in the period in which the estimate is revised and in any future periods affected.

(d) Foreign currency:

The functional and presentation currency of the Company is the US dollar.

(Tabular amounts in thousands of United States dollars, except per share amounts)

(e) Leases

Effective January 1, 2019, the Company adopted Financial Accounting Standards Board, or FASB, standard ASU No. 2016-02, "Leases (Topic 842)". The Company's operating leases of tangible property with terms greater than twelve months are recognized as right of use assets, which represents the lessee's right to use, or control the use of, a specified asset for the lease term, and a corresponding lease liability, which represents the lessee's obligation to make lease payments under a lease, measured on a discounted basis. The Company adopted the new standard using the alternative transition method, which permits a company to use its effective date as the date of initial application without restating comparative period financial statements. Landlord inducements in the form of free rent periods are netted against lease payments to the landlord in measuring right-of-use assets and lease liabilities.

Impact of adoption:

As a result of adopting Topic 842, we recorded as of January 1, 2019, a right of use asset of approximately $1.570 million, and a lease liability of approximately $1.647 million. Upon adoption, landlord inducements of approximately $78 thousand were de-recognized, and a corresponding adjustment was made to right-of-use assets.

(f) Concentration of risk:

The Company is subject to credit risk from the Company's cash and cash equivalents and investments. The carrying amount of the financial assets represents the maximum credit exposure. The Company manages credit risk associated with its cash and cash equivalents and investments by maintaining minimum standards of R1-low or A-low investments and the Company invests only in highly rated Canadian corporations which are capable of prompt liquidation.

3. Cash and cash equivalents:

Cash and cash equivalents consists of cash of $1.233 million (December 31, 2018 - $621 thousand), deposits in high interest savings accounts and other term deposits with maturities less than 90 days totaling of $15.348 million (December 31, 2018 - $14.678 million).

4. Right-of-use assets:

	Three months ended March 31, 2019	Year ended December 31, 2018
Right-of-use assets, January 1, 2019	1,570	–
Additions to right-of-use assets	234	–
Right-of-use assets, March 31, 2019	1,804	–
Accumulated amortization	(124)	–
Right-of use assets, NBV	1,680	–

(Tabular amounts in thousands of United States dollars, except per share amounts)

5. Investments:

Investments consisted of the following as of March 31, 2019 and December 31, 2018:

	March 31, 2019		
	Cost	Unrealized gain	Market value
Guaranteed investment certificate	$ 440	9	449

	December 31, 2018		
	Cost	Unrealized loss	Market value
Guaranteed investment certificate	$ 458	(18)	440

6. Fair value measurements and financial instruments:

The fair value hierarchy establishes three levels to classify the inputs to valuation techniques used to measure fair value.

Level 1 - inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities;

Level 2 - inputs are quoted prices in markets that are not active, quoted prices for similar assets or liabilities in active markets, inputs other than quoted prices that are observable for the asset or liability, or inputs that are derived principally from or corroborated by observable market data or other means; and

Level 3 - inputs are unobservable (supported by little or no market activity).

The fair value hierarchy gives the highest priority to Level 1 inputs and the lowest priority to Level 3 inputs.

The following table presents the Company's assets that are measured at fair value on a recurring basis for the periods presented:

	March 31, 2019	Level 1	Level 2	Level 3
Assets				
High interest savings account	$ 1,164	$ –	$ 1,164	$ –
United States treasury bills	4,486	–	4,486	–
Government of Canada promissory notes	4,986	–	4,986	–
Guaranteed investment certificates, Royal Bank of Canada	5,161	–	5,161	–
	$ 15,797	$ –	$ 15,797	$ –

(Tabular amounts in thousands of United States dollars, except per share amounts)

	December 31, 2018	Level 1	Level 2	Level 3
Assets				
High interest savings account	$ 496	$ –	$ 496	$ –
United States treasury bills	3,989	–	3,989	–
Canadian provincial promissory notes	5,991	–	5,991	–
Guaranteed investment certificates, Royal Bank of Canada	4,642	–	4,642	–
	$ 15,118	$ –	$ 15,118	$ –

7. Accrued liabilities:

Accrued liabilities as of March 31, 2019 and December 31, 2018 consisted of the following:

	March 31, 2019	December 31, 2018
Accrued personnel related costs	$ 907	$ 955
Accrued research and development expenses	198	257
Other accrued expenses	217	262
	$ 1,322	$ 1,474

8. Lease liability

Aptose leases office space and lab space in San Diego, California. The lease for the office space expires on March 31, 2023 and can be extended for an additional 5 year period. The lease for our lab space expired on February 29, 2019, and on February 18, 2019 was renewed until February 28, 2022. We lease office space in Toronto, Ontario, Canada. The lease for this location expires on June 30, 2023 with an option to renew for another 5-year period. The Company has not included any extension periods in calculating its right-to-use assets and lease liabilities. The Company also enters into leases for small office equipment.

Minimum payments, undiscounted, under our operating leases are as follows:

Years ending December 31,	
2019	$ 369
2020	521
2021	532
2022	460
2023	119
Thereafter	–
	$ 2,001

(Tabular amounts in thousands of United States dollars, except per share amounts)

To calculate the lease liability, the lease payments in the table above were discounted over the remaining term of the leases using the Company's incremental borrowing rate as at January 1, 2019 for existing leases at the time of adopting the Topic 842, and for new leases after the date adoption, as at the date of the execution date of the new lease. The following table presents the weighted average remaining term of the leases and the weighted average discount rate:

	Three months ended March 31, 2019
Weighted-average remaining term – operating leases (in years)	3.8
Weighted-average discount rate – operating leases	5.42%
Lease liability, current portion	485
Lease liability, long term portion	1,322
Lease liability, total	1,807

Right-of-use assets obtained in exchange for new operating lease liabilities are as follows:

		Three months ended March 31, 2019
Right-of-use assets recorded upon adoption of Topic 842, January 1, 2019	$	1,570
Right-of-use assets obtained in exchange for new operating lease liabilities in the period	$	234

Operating lease costs and operating cash flows from our operating leases are as follows:

		Three months ended March 31, 2019
Operating lease cost	$	148
Operating cash flows from operating leases	$	99

Comparable figures are not presented as the Company adopted the new standard using the alternative transition method, which permits a company to use its effective date as the date of initial application without restating comparative period financial statements.

9. Share capital:

The Company has authorized share capital of an unlimited number of common voting shares.

(a) Equity issuances:

(i) 2018 Share Purchase agreement

On May 30, 2018, the Company entered into the 2018 Aspire Purchase Agreement, which provides that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital is committed to purchase up to an aggregate of $20 million of Common Shares over approximately 30 months. Pursuant to the terms of this agreement, on June 8, 2018, the Company issued 170,261 Common Shares ("Commitment Shares") to Aspire Capital in consideration for entering into the 2018 Aspire Purchase Agreement. The Company recorded $600 thousand in general and administrative expenses related to the issuance of the Commitment Shares. During the three months ended March 31, 2019, the Company issued 3,259,955 common shares under the 2018 Aspire Purchase Agreement at an average price of $1.84 per share for gross and net proceeds of $6 million. On a cumulative basis to March 31, 2019, the Company has raised a total of approximately $7.9 million gross and net proceeds under the Aspire Purchase Agreement.

(Tabular amounts in thousands of United States dollars, except per share amounts)

(ii) 2017 Share purchase agreement

On October 27, 2017, we entered into the 2017 Aspire Purchase Agreement, which provided that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital is committed to purchase up to an aggregate of $15,500,000 of Common Shares over approximately 30 months. During the year ended December 31, 2017, and pursuant to the terms of the Aspire Purchase Agreement, Aspire Capital purchased 357,143 Common Shares for gross proceeds of $500 thousand ($324 thousand net of cash share issue costs) and we also issued 321,429 Common Shares to Aspire Capital in consideration for entering into the Aspire Purchase Agreement. On a cumulative basis to March 31, 2018, the Company has raised a total of $9.4 million gross proceeds under the Aspire Purchase Agreement, the total amount that was available under the Agreement. On a cumulative basis to December 31, 2018, the Company has raised a total of $15.5 million gross proceeds under the Aspire Purchase Agreement, the total amount that was available under the Agreement.

(iii) 2018 At-The-Market ("ATM") Facility

On March 28, 2018, the Company entered into an "At-The-Market" Facility ("ATM") equity distribution agreement with Cantor Fitzgerald acting as sole agent. Under the terms of this facility, the Company may, from time to time, sell shares of our common stock having an aggregate offering value of up to $30 million through Cantor Fitzgerald on the Nasdaq Capital Market. During the three months ended March 31, 2019, the Company issued 77,349 shares under this ATM equity facility at an average price of $2.37 for gross proceeds of $183 thousand ($178 thousand net of share issue costs). Costs associated with the proceeds consisted of a 3% cash commission. On a cumulative basis to March 31, 2019, the Company has raised a total of $11.2 million gross proceeds ($10.9 million net of share issue costs) under the ATM Facility.

(b) Loss per share:

Loss per common share is calculated using the weighted average number of common shares outstanding and is presented in the table below:

	Three months ended March 31, 2019	Three months ended March 31, 2018
Net loss	$ (5,506)	$ (6,814)
Weighted-average common shares – basic and diluted	39,846	29,042
Net loss per share – basic and diluted	$ (0.14)	$ (0.23)

The effect of any potential exercise of the Company's stock options outstanding during the three month periods ended March 31, 2019 and March 31, 2018 has been excluded from the calculation of diluted loss per common share as it would be anti-dilutive.

10. Stock-based compensation:

(a) Stock options

Under the Company's stock option plan, options, rights and other entitlements may be granted to directors, officers, employees and consultants of the Company to purchase up to a maximum of 17.5% of the total number of outstanding common shares, estimated at 7.3 million options, rights and other entitlements as at March 31, 2019. Options are granted at the fair market value of the common shares on the closing trading price of the Company's stock on the day prior to the grant if the grant is made during the trading day or the closing trading price on the day of grant if the grant is issued after markets have closed. Options vest at various rates (immediate to four years) and have a term of 10 years.

(Tabular amounts in thousands of United States dollars, except per share amounts)

Stock option transactions for the three months ended March 31, 2019, are summarized as follows:

Option numbers are in (000's)

	Options	Three months ended March 31, 2019 Weighted average exercise price	Weighted average remaining contractual life (years)
Outstanding, beginning of period	4,489	$ 3.11	
Granted	1,414	1.91	
Forfeited	(119)	2.67	
Outstanding, end of the period	5,784	2.86	8.1
Exercisable, end of the period	3,237	3.33	7.2
Vested and expected to vest, end of period	5,400	2.90	8.0

As of March 31, 2019, there was $2.19 million of total unrecognized compensation cost related to non-vested stock options, which is expected to be recognized over an estimated weighted-average period of 1.71 years.

The following table presents the weighted average assumptions that were used in the Black-Scholes option pricing model to determine the fair value of stock options granted during the period, and the resultant weighted average fair values:

	Three months ended March 31, 2019	Three months ended March 31, 2018
Risk-free interest rate	2.41%	2.39%
Expected dividend yield	–	–
Expected volatility	84.0%	93.9%
Expected life of options (in years)	5	5
Grant date fair value	$ 1.29	$ 2.14

The Company uses historical data to estimate the expected dividend yield and expected volatility of its common shares in determining the fair value of stock options. The expected life of the options represents the estimated length of time the options are expected to remain outstanding.

Stock options granted by the Company during the three months ended March 31, 2019, vest 50% after one year and 16.67% on each of the next three anniversaries, except for 335,000 options which vest 100% after one year.

Stock options granted by the Company during the three months ended March 31, 2018, vest 50% after one year and 16.67% on each of the next three anniversaries, except for 91,000 options which vest 50% after one year and 25% on each of the next two anniversaries and 850,000 options which vested immediately on the grant date.

The Company recorded share-based payment expense related to stock options as follows:

	Three months ended March 31, 2019	Three months ended March 31, 2018
Research and development	$ 118	$ 367
General and administrative	544	1,861
Total	$ 662	$ 2,228

11. Related party transactions:

The Company uses Moores Cancer Center at the University of California San Diego (UCSD) to provide pharmacology lab services to the Company. Dr. Stephen Howell is the Acting Chief Medical Officer of Aptose and is also a Professor of Medicine at UCSD and oversees the laboratory work. The work is completed under the terms of research services agreements executed in March 2015 and has been extended annually. In March 2019, the Board approved an extension of this agreement for twelve months for services up to $300,000. These transactions are in the normal course of business and are measured at the amount of consideration established and agreed to by the related parties.

During the three months ended March 31, 2019, the Company recorded $62 thousand (2018 – $61 thousand) in research and development expenses related to the agreement.

12. Subsequent events

Subsequent to the quarter end, the Company issued 2,242,478 shares under the 2018 Aspire Purchase Agreement at an average price of $1.7837 per share for gross and net proceeds of $4 million.

ITEM 2 - MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

This discussion contains forward-looking statements that involve risks and uncertainties. When reviewing the discussion below, you should keep in mind the substantial risks and uncertainties that impact our business. In particular, we encourage you to review the risks and uncertainties described in "Risk Factors" in Part II, Item 1A in this Quarterly Report on Form 10-Q. These risks and uncertainties could cause actual results to differ materially from those projected or implied by our forward-looking statements contained in this report. These forward-looking statements are made as of the date of this management's discussion and analysis, and we do not intend, and do not assume any obligation, to update these forward-looking statements, except as required by law.

The following discussion should be read in conjunction with our condensed consolidated interim financial statements and accompanying notes contained in this Quarterly Report on Form 10-Q and our audited financial statements and related notes included in our Annual Report on Form 10-K for the year ended December 31, 2018.

All amounts are expressed in United States dollars unless otherwise stated.

OVERVIEW

Aptose Biosciences is a science-driven biotechnology company advancing first-in-class targeted agents to treat life-threatening cancers, such as acute myeloid leukemia ("AML"), high-risk myelodysplastic syndromes ("MDS"), chronic lymphocytic leukemia ("CLL") and other hematologic malignancies. Based on insights into the genetic and epigenetic profiles of certain cancers and patient populations, Aptose is building a pipeline of novel oncology therapies directed at dysregulated processes and signaling pathways. Aptose is developing targeted medicines for precision treatment of these diseases, based on the specific gene expression signature of a patient's malignancy. In the treatment of cancer, this strategy is intended to optimize efficacy and quality of life by minimizing the cytotoxic side effects associated with conventional therapies. We currently have in development two molecules: CG026806 ("CG-806") and APTO-253, both being evaluated for safety, tolerance, pharmacokinetics and signals of efficacy in Phase 1 clinical trials. Each molecule is described below:

CG-806 is an orally administered, highly potent first-in-class pan-FLT3/pan-BTK inhibitor. Development of CG-806 is intended for the treatment of patients having B-cell malignancies including CLL, small lymphocytic lymphoma ("SLL") and certain non-Hodgkin's lymphomas ("NHL") that are resistant/refractory/intolerant to other therapies, as well as for patients with relapsed/refractory Acute Myeloid Leukemia ("R/R AML"), including the emerging populations resistant to FMS-like tyrosine kinase 3 ("FLT3") inhibitors. CG-806 is a highly potent, reversible, non-covalent inhibitor of the wild type and mutant forms of the Bruton's tyrosine kinase ("BTK") enzyme. Overexpression of BTK drives certain B cell malignancies, and treatment of such B cell malignancies with covalent BTK inhibitors that target the cysteine residue in the active site of BTK have heralded dramatic responses in many patients, but also can lead to drug resistance via mutation of the cysteine amino acid residue to a serine residue ("BTK-C481S mutant") thus rendering such covalent inhibitors less effective. CG-806 targets the ATP-binding pocket of BTK through a reversible, non-covalent mechanism, thereby allowing CG-806 to retain low nanomolar potency against the BTK-C481S mutant enzyme. Simultaneously, CG-806 inhibits aberrant intracellular BTK signaling and a handful of other oncogenic signaling pathways, thereby allowing CG-806 to exert potent and direct killing of the cancer cells without targeting pathways often associated with toxicities. Thus, CG-806 may serve as a novel therapeutic agent to treat B cell malignancy patients that are refractory, resistant or intolerant to covalent BTK inhibitors and other non-covalent BTK inhibitors currently in development. In addition to potent inhibition of wild type and mutant forms of the BTK enzyme, CG-806 exhibits high potency (picomolar to low nanomolar IC_{50} values) for inhibition of the FLT3 cell surface receptor with the Internal Tandem Duplication ("FLT3-ITD") and significant potency against all other mutant forms of FLT3. Because of the potency of CG-806 against the FLT3 receptor, it may become an effective therapy for AML patients, including the subset of patients having the FLT3-ITD, which occurs in approximately 30% of patients with AML and is associated with poor prognosis. As noted above, CG-806 also suppresses the initiation and intracellular transmission of other oncogenic signaling pathways which are operative in AML, thereby potentially allowing the agent to become a broadly active and important therapeutic option for the difficult-to-treat AML patient population and hopefully slowing the pace of drug resistance in patients.

APTO-253 is our Phase 1-stage small molecule therapeutic agent that inhibits expression of the MYC oncogene without causing general myelosuppression of the bone marrow. The MYC oncogene is overexpressed in hematologic cancers, including AML and certain B cell malignancies. MYC is a transcription factor that regulates cell growth, proliferation, differentiation and apoptosis, and overexpression amplifies new sets of genes to promote survival of cancer cells. APTO-253 down regulates expression of the MYC oncogene in AML cells and depletes those cells of the MYC oncoprotein, leading to apoptotic cell death in AML cells. Indeed, the first AML patient administered the lowest dose level (20 mg/m2) of APTO-253 experienced a significant reduction in the expression of MYC in blood cells ("PBMCs") during the 28-day cycle of therapy, and no drug-related adverse events were noted. Thus, APTO-253 may serve as a safe and effective MYC inhibitor for AML that combines well with other agents and does not significantly impact the normal bone marrow.

PROGRAM UPDATES

CG-806

On March 25, 2019, we announced that the U.S Food and Drug Administration ("FDA") granted Aptose Investigational New Drug ("IND") allowance to initiate its Phase 1 clinical trial for CG-806. The Phase 1 clinical trial is a multicenter, open label, dose-escalation study with expansions to assess the safety, tolerability, PK, and preliminary efficacy of CG-806 in patients with CLL, SLL or NHL. The initial goal of the trial is to evaluate safety, tolerability and pharmacokinetics of CG-806 in these patient populations and to observe for signals of efficacy. CG-806 in gelatin capsules will be dosed every 12 hours during a 28-day cycle, and the starting dose will be 150mg. Pending the collection of predictive pharmacokinetic data in humans, Aptose plans to seek allowance from the FDA to move CG-806 into the AML/MDS patient population in a separate Phase I trial.

In May 2018, we paid $2.0 million in cash and obtained the rights to CG-806, for all fields of use, in all territories outside of the Republic of Korea and China, by exercising an option we obtained through a June 2016 option-license agreement with South Korean company CrystalGenomics, Inc. ("CG"), granting us an exclusive option to research, develop and commercialize (collectively the "Rights") CG-806.

In June 2018, we entered into a separate license agreement with CG for Aptose to gain a license for Rights to CG-806 in the People's Republic of China, Hong Kong and Macau (the "China Rights"). Under the license agreement, Aptose made an upfront payment to CG of $3.0 million for the China Rights. CG is eligible for payments upon the achievement of developmental, regulatory and commercial-based milestones, as well as single-digit royalties on product sales in China. Aptose now owns worldwide Rights to CG-806, including an issued patent in China but excluding any Rights in Korea.

We created a scalable chemical synthetic route for the manufacture of CG-806 drug substance and have scaled the manufacture of API (active pharmaceutical ingredient, or drug substance) to kg levels. We manufactured and delivered a batch of API which was used for Dose Range Finding Studies that were performed and completed in early January 2018. We completed in March 2018 the manufacture of a multi-kg batch of Good Laboratory Practice ("GLP") grade API and then formulated that API into a drug product for use in IND-enabling GLP toxicology studies. We also completed the manufacture of a multi-kg batch of API under Good Manufacturing Product ("GMP") conditions as our API supply for our first-in-human clinical trials, and we manufactured under GMP conditions two dosage strengths of capsules to serve as our clinical supply in those human studies. Although we have been able to manufacture API and capsules to support clinical supplies under GMP conditions, research and development funds are being utilized to support further exploratory formulation studies in an ongoing effort to craft a superior formulation for CG-806. During the year ended December 31, 2018, we completed the in-life dosing phase of the IND-enabling GLP toxicology studies and received audited reports for such studies early in fiscal 2019.

We have continued to augment our patent protection on CG-806. On September 12, 2017, we announced that we received a notice from the United States Patent and Trademark Office ("USPTO") stating that our U.S. Patent Application had been issued as a patent. The patent claims numerous compounds, including the CG-806 compound, pharmaceutical compositions comprising the CG-806 compound, and methods of treating various diseases caused by abnormal or uncontrolled activation of protein kinases. On July 9, 2018, we received a notice from the Japan Patent Office stating that our Japan Patent Application has been issued as a patent. The patent claims the CG-806 compound, pharmaceutical compositions comprising the CG-806 compound, and uses for treating various diseases caused by abnormal or uncontrolled activation of protein kinases. On September 27, 2018, we announced that the European Patent Office had issued a patent. The granted patent claims the CG-806 compound, pharmaceutical compositions comprising the CG-806 compound, and uses for treating diseases caused by abnormal or uncontrolled activation of protein kinases, such as cancer. This European patent will be nationalized in, and cover, approximately forty European countries including the United Kingdom, France, Germany, Italy, the Netherlands and Spain. The patent is expected to provide protection until the end of 2033. Finally, on March 4, 2019, we announced that the Australian Patent Office had issued a patent that claims various compounds, including the CG-806 compound, pharmaceutical compositions comprising the CG-806 compound, and uses for the treatment of various diseases, such as lymphoma or leukemia. The patent is expected to provide protection until December 2033.

We have completed several studies that demonstrate the highly differentiated profile of CG-806. Key studies that have been presented at scientific forums are as follows:

On April 15, 2018, at the 2018 Annual Meeting of the American Association for Cancer Research (AACR), we presented with the OHSU Knight Cancer Institute preclinical data demonstrating that CG-806, a pan-FLT3/pan-BTK inhibitor, demonstrates broader activity and superior potency to other FLT3 and BTK inhibitors against primary bone marrow samples from patients with hematologic malignancies. We also presented preclinical data demonstrating CG-806 targets multiple pathways to kill diverse subtypes of AML and B-cell malignancies in vitro.

On June 15, 2018, at the 23rd Congress of the European Hematology Association (EHA), we presented, during a poster presentation, preclinical data demonstrating CG-806 unique binding to wild type and C481S mutant BTK. Further, we presented that CG-806 suppresses the BCR, AKT/PI3K, ERK and NFkB signaling pathways and exerts broader and far greater potency of direct cancer cell killing that Ibrutinib against malignant bone marrow cells from patients with CLL, ALL and a host of other hematologic malignancies.

On December 3, 2018, we announced two separate poster presentations at the American Society of Hematology (ASH) Annual Meeting being held on December 1-4, 2018. The OHSU Knight Cancer Institute and Aptose presented data in one poster and the team at The University of Texas MD Anderson Cancer Center ("MDACC") presented data in a separate poster. These presentations highlighted several key findings. First, in collaboration with the MDACC, orally administered CG-806 demonstrated efficacy in a patient derived xenograft ("PDX") study in which the bone marrow cells from a patient with AML having dual ITD and D835 mutations in FLT3 were implanted into a mouse. The dual FLT3 mutant form of AML represents a very difficult to treat population that has shown resistance to other FLT3 inhibitors, and data from the PDX model suggest that CG-806 may be useful in treating such patients. Secondly, Aptose presented high level data from preclinical GLP toxicology studies that demonstrate orally administered CG806 is a well-tolerated targeted molecule. Finally, in collaboration with the OHSU Knight Cancer Center, studies of CG-806 on 124 samples of freshly isolated bone marrow from CLL patients demonstrated both broader and greater cell killing potency for CG-806 than Ibrutinib.

On April 1, 2019, at the 2019 Annual Meeting of the American Association for Cancer Research (AACR), Aptose, along with our collaborators at OHSU Knight Cancer Institute, presented data highlighting CG-806 was more potent than other FLT3 inhibitors including midostaurin, sorafenib, sunitinib, dovitinib, quizartinib, crenolanib and gilteritinib. CG-806 was equally potent against cells from patients in the adverse, intermediate and favorable risk groups (2017 ELN risk stratification), and cells from patients with relapsed or transformed AML (World Health Organization classification) were as sensitive as those from patients with de novo AML. The data demonstrated potency in primary AML patient samples across all AML subgroups including relapsed/refractory/transformed AML and those with genetic abnormalities related to poor prognosis. While patient samples with FLT3-ITD mutations were expected to have greater sensitivity to CG-806, the most surprising correlation was the sensitivity of patient samples with IDH1 R132 mutations. The enhanced sensitivity of IDH-1 mutant AML to CG-806 warrants investigation in the clinical setting. Moreover, in studies of CG-806 on AML patient bone marrow samples, we demonstrated that mutations in p53, ASXL1 and NPM1 do not hinder the potency of CG-806.

CG-806 is being developed with the intent to deliver the agent as an oral therapeutic and to develop it for relapsed and refractory (R/R) AML/ MDS and for appropriate B cell malignancies (including CLL, SLL and NHL). In collaboration with the FDA, we were granted IND allowance to evaluate CG-806 as part of a Phase 1 program in patients with B cell malignancies, and we now are finalizing our strategy to perform the clinical studies in patients with AML/MDS. As clinical trials are lengthy, complex, costly, and uncertain processes, an estimate of the future costs is not reasonable at this time.

On December 26, 2017, we announced that the FDA granted orphan drug designation to CG-806 for the treatment of patients with AML. Orphan drug designation is granted by the FDA to encourage companies to develop therapies for the treatment of diseases that affect fewer than 200,000 individuals in the United States. Orphan drug status provides research and development tax credits, an opportunity to obtain grant funding, exemption from FDA application fees and other benefits. If CG-806 is approved to treat AML, the orphan drug designation provides us with seven years of marketing exclusivity.

APTO-253

Phase IB Trial

APTO-253, a small molecule inhibitor of MYC gene expression, is being evaluated by Aptose in a Phase Ib clinical trial in patients with relapsed / refractory ("R/R") hematologic malignancies, particularly R/R-AML and high-risk MDS. The Phase Ib, multicenter, open-label, dose-escalation clinical trial of APTO-253 is designed to assess the safety, tolerability, pharmacokinetics and pharmacodynamic responses and efficacy of APTO-253 as a single agent and determine the recommended Phase II dose. APTO-253 will be administered once weekly, over a 28-day cycle. The dose escalation stage of the study could potentially enroll up to 20 patients with R/R-AML or high-risk MDS. The study is designed to then transition, as appropriate, to single-agent expansion cohorts in R/R-AML and/or high-risk MDS.

We initiated our first site in September 2018 and it is important to note 1) only one patient is required for each of the two lowest dose cohorts in this study, 2) that R/R-AML patients are acutely ill, and 3) that a DLT in the first or second cohort could require expansion of the cohort to six patients. For these reasons, Aptose is exercising a highly judicious selection process for patients in the lowest two dose cohorts. On November 28, 2018 we announced that we dosed the first patient in the re-initiation of the Phase 1b Clinical Study of APTO-253. In January 2019, we provided data on the Aptose website that we observed meaningful reductions in MYC expression in the PBMC from the first patient dosed with the new formulation of APTO-253. Efforts continue to activate additional clinical sites and recruit AML/MDS patients with high performance status.

We are continuing to manufacture additional drug substance and drug product for use in the ongoing trial. We have completed a second 2kg GMP batch of drug substance and plan shortly to manufacture an additional batch of GMP drug product.

We expect to initiate studies to investigate additional drug delivery methods for APTO-253 and to initiate additional non-clinical studies for solid tumor and hematologic cancer development. As preparing, submitting, and advancing applications for regulatory approval, developing drugs and drug product and clinical trials are sometimes complex, costly, and time-consuming processes, an estimate of the future costs is not reasonable at this time.

Clinical Hold – 2015, Resolved

APTO-253, a small molecule MYC inhibitor, was being evaluated by Aptose in a Phase Ib clinical trial in patients with R/R hematologic malignancies, particularly R/R-AML and high-risk MDS before being placed on clinical hold by the FDA in November 2015. The Phase Ib trial of APTO-253 was placed on clinical hold as a consequence of an event that occurred at a clinical site with the infusion procedure. Ultimately, a root cause investigation determined that the event resulted from chemistry and manufacturing based issues, all of which were incorporated into a Chemistry, Manufacturing and Control amendment to the IND application. Effective June 29, 2018, the clinical hold was lifted and the APTO-253 clinical trial was re-initiated.

The Phase Ib trial was placed on clinical hold in order to solve a chemistry-based formulation issue, and the chemistry of the API and the formulation had undergone minor modifications to deliver a stable and soluble drug product for return to the clinical setting. In December 2016, we had successfully manufactured multiple non-GMP batches of a new drug product formulation for APTO-253; however, a batch that was the intended clinical supply encountered an unanticipated mishap during the filling process that compromised the stability of that batch of drug product. We conducted formal root cause analyses studies, identified the reason for the drug product stability failure, and established a corrective and prevention action plan for the manufacture of future batches of drug product. During the first quarter of 2018, we manufactured a new GMP clinical supply of drug product and performed studies required to demonstrate the fitness of the drug product for clinical usage. The release specifications for the new clinical supply were met, and we presented the findings to the FDA in the second quarter of 2018. On June 28, 2018, the FDA notified us that it had lifted the clinical hold on APTO-253.

We then completed all tasks required to return APTO-253 to the Phase Ib clinical trial.

Preclinical data presented at scientific forums are as follows:

- On April 17, 2018, at the 2018 Annual Meeting of the American Association for Cancer Research (AACR), we presented preclinical data demonstrating that APTO-253 is a new addition to the repertoire of drugs that can exploit DNA BRCA1/2 deficiency, broadening the potential applicability of APTO-253 towards solid cancer indications.

- On June 4, 2018, we announced that preclinical data elucidating the mechanism of action of APTO-253 were published in two separate articles in the June 2018 issue (Volume 17, Number 6) of Molecular Cancer Therapeutics, a peer-reviewed journal of the American Associate for Cancer Research. The most important finding disclosed in the published articles is the ability of the APTO-253 small molecule to bind to and stabilize a G-quadruplex DNA motif found in the promoter regulatory region of the MYC oncogene and to inhibit expression of the MYC gene, thereby depleting the cells of the MYC oncoprotein and leading to cancer cell death. These findings make APTO-253 the only clinical stage molecule that can directly target the MYC gene and inhibit its expression.

- On April 1, 2019, at the 2019 Annual Meeting of the American Association for Cancer Research (AACR), Aptose, we presented in vitro studies that further define the mechanism of action of APTO-253. Researchers found that APTO-253 targets a G-quadruplex motif in the P1/P2 promoter region of the MYC gene and inhibits MYC gene expression to induce apoptosis, resulting in its ability to potently kill hematologic malignant cell lines and primary samples from AML and CLL patients. In this study, researchers performed long-term in vitro studies to determine if and how cells might develop resistance to APTO-253. MYC driven Raji cells required three years in increasing concentrations of APTO-253 in order to adopt multiple modifications and develop high level resistance to APTO-253. These modifications include up-regulation of the ABCG2 transporter, acquisition of a more stable MYC protein lacking the conserved core sequence of MYC Box III generated by deletion of an internal region of the MYC gene exon 2, and utilization of alternate P3 promoter not inhibited by G4 binding and stabilization.

Multi-Targeting Epigenetic Program

In November 2015, we announced an exclusive drug discovery partnership with Laxai Avanti Life Sciences ("LALS") for the development of next generation epigenetic-based therapies. Under the agreement, LALS was responsible for optimizing candidates derived from our collaboration with the Moffitt Cancer Center, which was terminated in January 2017, for the development of dual-targeting single agent inhibitors for the treatment of hematologic and solid tumor cancers and we would own global rights to all newly discovered candidates characterized and optimized under the collaboration, including all generated intellectual property. As of November 2016, LALS and we had generated novel compounds that inhibit both the bromodomain proteins and oncogenic kinases, while improving pharmaceutical properties that could serve as a basis for further optimization towards a lead preclinical candidate. However, due to a prioritization of development efforts, LALS and we suspended work on the program in January 2017, and the collaboration with LALS was terminated. However, the program delivered novel intellectual property and compelling hit molecules for further optimization.

On March 7, 2018, we entered into an exclusive global license agreement with Ohm Oncology ("OHM"), an affiliate of LALS that was formed in 2016 to advance the clinical development of compelling molecules derived from the LALS initiative, for the development, manufacture and commercialization of APL-581, as well as related molecules from our dual bromodomain and extra-terminal domain motif protein and kinase inhibitor program. Under the agreement, we will retain reacquisition rights to certain molecules, while OHM/LALS will have the rights to develop and sublicense all other molecules. We have received two separate upfront cash payments and are eligible to receive up to $125 million of additional payments based on the achievement of certain development, regulatory and sales milestones, as well as significant royalties on future sales generated from the program, if any.

LIQUIDITY AND CAPITAL RESOURCES

Since our inception, we have financed our operations and technology acquisitions primarily from equity financing, proceeds from the exercise of warrants and stock options, and interest income on funds held for future investment.

The following table presents our cash and cash equivalents, investments and working capital as at March 31, 2019 and December 31, 2018.

(in thousands)	Balances at March 31, 2019	Balances at December 31, 2018
Cash and cash equivalents	$ 16,581	$ 15,299
Investments	449	440
Total	$ 17,030	$ 15,739
Working capital	$ 14,687	$ 13,697

Working capital reflects cash, cash equivalents, investments and prepaid expenses and other current assets less current liabilities. Current liabilities of $2.977 million as at March 31, 2019 include approximately $485 thousand related to the current portion of the Company's lease liability. There is no comparable amount in current liabilities of $2.789 million as at December 31, 2018. See "Critical Accounting Policies" below.

We do not expect to generate positive cash flow from operations for the foreseeable future due to additional research and development costs, including costs related to drug discovery, preclinical testing, clinical trials, and manufacturing, as well as operating expenses associated with supporting these activities. It is expected that negative cash flow will continue until such time, if ever, that we receive regulatory approval to commercialize any of our products under development and/or royalty or milestone revenue from any such products exceeds expenses.

Cash flows:

The following table presents a summary of our cash flows for the three months ended March 31, 2019 and 2018:

(in thousands)	For the Three Months Ended, March 31, 2019	March 31, 2018
Net cash provided by (used in):		
Operating activities	$ (4,874)	$ (4,054)
Investing activities	(24)	(24)
Financing activities	6,178	8,855
Effect of exchange rates changes on cash and cash equivalents	2	-
Net increase in cash and cash equivalents	$ 1,282	$ 4,777

We are an early stage development company and we currently do not earn any significant revenues from our drug candidates. The continuation of our research and development activities and the commercialization of the targeted therapeutic products are dependent upon our ability to successfully finance and complete our research and development programs through a combination of equity financing and payments from strategic partners. We have no current sources of significant payments from strategic partners.

In managing our liquidity risk, we have considered our available cash and cash equivalents and investments as at March 31, 2019. We have also considered our ability to continue to raise funds in 2019 through the ATM Facility with Cantor Fitzgerald and through the 2018 Purchase Agreement with Aspire Capital, each of which is described further below, in assessing whether we will have sufficient resources to fund research and development operations through to at least the twelve-month period ending from the date of this report.

At-The-Market Facility

On March 27, 2018, we entered into an at-the-market equity facility ("ATM Facility") with Cantor Fitzgerald & Co ("Cantor Fitzgerald"), acting as sole agent. Under the terms of this facility, we may, from time to time, sell our Common Shares having an aggregate offering value of up to $30 million through Cantor Fitzgerald. We determine, at our sole discretion, the timing and number of shares to be sold under the ATM Facility.

During the year ended December 31, 2018, we issued 4,085,615 Common Shares under the ATM Facility at an average price of $2.71 for gross proceeds of approximately $11.1 million ($10.7 million net of share issue costs). In the three-month period ended March 31, 2019, we issued an additional 77,349 Common Shares under this facility at an average price of $2.37 for gross proceeds of approximately $183.0 thousand. As at the filing date of this Quarterly Report on Form 10-Q , there is approximately $18.7 million available on this facility.

Common Shares Purchase Agreements

In October 2017, we entered into a Common Shares Purchase Agreement (the "Purchase Agreement") with Aspire Capital Fund, LLC ("Aspire Capital") to sell up to $15.5 million of Common Shares to Aspire Capital. Under the terms of the Purchase Agreement, in October 2017, Aspire Capital made an initial purchase of 357,143 Common Shares at a price of $1.40 per share, representing gross proceeds of approximately $500.0 thousand ($324.0 thousand net of share issue costs). We also issued 321,429 Common Shares at a value of $1.40 per share to Aspire Capital as consideration for Aspire Capital entering into the Purchase Agreement. During the year ended December 31, 2018, we issued 5,231,953 Common Shares under the Purchase Agreement at an average price of $2.77 for gross proceeds of approximately $15 million.

On a cumulative basis, we raised a total of $15.5 million under the Purchase Agreement, the total amount that was available under the Purchase Agreement.

In May 2018, we entered into a second Common Share Purchase Agreement (the "2018 Purchase Agreement") with Aspire Capital to sell up to $20.0 million of Common Shares to Aspire Capital. Under the terms of the 2018 Purchase Agreement, Aspire Capital has committed to purchase up to an aggregate of $20.0 million of our Common Shares, at our request from time to time during a 30-month period beginning on the effective date of a registration statement related to the transaction and at prices based on the market price at the time of each sale. The registration statement was made effective on June 8, 2018. Under the terms of the 2018 Purchase Agreement, we issued 170,261 Common Shares at a value of $3.524 per share to Aspire Capital as consideration for Aspire Capital entering into the 2018 Purchase Agreement, and during the year ended December 31, 2018, we issued 907,547 Common Shares at an average price of $2.12 for gross proceeds of approximately $1.9 million. In the three months ended March 31, 2019, we issued 3,259,955 shares at an average price of $1.84 per share for gross proceeds of $6.0 million**.** Subsequent to March 31, 2019, we issued 2,242,478 Common Shares at a price of approximately $1.78 per share for gross and net proceeds of $4.0 million. As of May 2, 2019, the Company has issued 6,409,980, the maximum number of shares issuable under this facility without shareholder approval and on May 7, 2019 the agreement was terminated.

On May 7, 2018 we entered into a new Common Share Purchase Agreement (the "Agreement") with Aspire Capital Fund, LLC ("Aspire Capital") where Aspire Capital has committed to purchase up to $20MM of common shares of Aptose, at Aptose's request from time to time, for up to 30 months. The Agreement is subject to approval by the Toronto Stock Exchange ("TSX") and NASDAQ, limits the amount of Aptose's common shares that Aspire can own at one time to 9.99% of the issued and outstanding common shares of the Company, and limits the maximum number of common shares that can be issued under the Agreement to 19.99% of the Company's outstanding common shares on the date of the Agreement unless shareholder approval is obtained or the shares issued to date once the 19.99% threshold is reached have an average purchase price equal to or exceeding $2.10.

Upon receipt of the TSX and NASDAQ approval, as consideration for Aspire Capital's obligation under the Agreement Aptose will issue 171,428 common shares to Aspire Capital as a commitment fee.

We will need additional cash in order to execute our research and development plans for our CG-806 and APTO-253 programs and associated general and administrative overhead costs. The Company will use the most efficient source of capital available to it which may include funds available from the ATM Facility.

Contractual Obligations

During the three-month period ended March 31, 2019, we entered into an operating lease agreement to renew our existing laboratory space for a three-year period. Minimum lease payments are as follows: $61 thousand for the remaining 9 months of 2019, $84 thousand for the year ended December 31, 2020; $86 thousand for the year ended December 31, 2021 and $14 thousand for the year ended December 31, 2022. These lease payments, along with our lease payments for our other operating leases, have been recorded as a right-of-use asset and lease liability on the statement of financial position. See "Critical Accounting Policies" below.

Other than the above, there were no material changes to our contractual obligations and commitments described under Item 7 – Management's Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the fiscal year ended December 31, 2018, which can be found on EDGAR at www.sec.gov/edgar.shtml and on SEDAR at www.sedar.com.

RESULTS OF OPERATIONS

A summary of the results of operations for the three month period ended March 31, 2019 and 2018 is presented below:

(in thousands)	Three months ended March 31, 2019	2018
Revenues	$ -	$ -
Research and development expenses	3,340	3,140
General and administrative expenses	2,260	3,702
Total other income	94	28
Net loss	(5,506)	(6,814)
Other comprehensive gain/(loss)	9	(2)
Total comprehensive loss	(5,497)	(6,816)
Basic and diluted loss per common share	(0.14)	$ (0.23)

The net loss for the three-month period ended March 31, 2019 decreased by $1.3 million to $5.5 million as compared with $6.8 million for the comparable period primarily as a result of a decrease of $1.6 million lower stock-based compensation in the current period, higher professional fees related to regulatory filings in the comparable period in support of financing activities and offset by higher operational costs (such as rent, salaries and travel) associated with having two molecules in clinical development.

Research and Development

The research and development expenses for the three-month period ended March 31, 2019 and 2018 are as follows:

(in thousands)	Three months ended March 31, 2019	2018
Program costs – CG-806	$ 1,386	$ 1,354
Program costs – APTO-253	1,128	921
Personnel expenses	699	489
Stock-based compensation	118	367
Depreciation of equipment	9	9
	3,340	3,140

Research and development expenses of $3.3 million for the three-month period ended March 31, 2019 were comparable with $3.1 million for the comparative period. Changes to the components of our research and development expenses presented in the table above are primarily as a result of the following events:

- In the three-month period ended March 31, 2019, program costs for our CG-806 consisted mostly of costs to complete the preclinical studies and prepare regulatory filings in support of an IND filing, and the manufacturing of drug product for the Phase 1clinical trial. In the comparative period, expenses reflected the completion of two dose range finding studies and the manufacturing of a batch of the drug substance to be used in toxicity studies.
- In the three-month period ended March 31, 2019, program costs for our APTO-253 program consisted mostly of costs related to the Phase 1b clinical trial, and manufacturing costs for a second GMP batch of APTO-253. In the comparative period, the Company completed production of a GMP batch of drug product, and initiated necessary studies to present to the FDA in support of removing the clinical hold.
- An increase in personnel expenses mostly related to additional clinical research staff to support two Phase 1 clinical trials.
- A decrease in stock option compensation related mostly to stock options granted in the three-month period ended March 31, 2018, of which 100,000 with a grant date fair value of $2.03 vested immediately, contributing to higher expenses in that period.

General and Administrative

The general and administrative expenses for the three-month periods ending March 31, 2019 and 2018 are as follows:

(in thousands)	Three months ended March 31, 2019	2018
General and administrative, excluding non-cash items	$ 1,696	$ 1,834
Stock-based compensation	544	1,861
Depreciation of equipment	20	7
	$ 2,260	$ 3,702

General and administrative expenses of $2.3 million for the three-month period ended March 31, 2019 decreased by approximately $1.4 million compared with $3.7 million for the comparative period, primarily as a result of the following:

- General and administrative expenses, excluding non-cash items, decreased by approximately $138.0 thousand, primarily as a result of higher professional and regulatory fees in support of financing activities in the three months ended March 31, 2018, and offset by higher travel, rent and salaries expense in the current period, in support of increased activities in the business.
- Stock-based compensation decreased by approximately $1.3 million in the three months ended March 31, 2019, compared with the three months ended March 31, 2018 mostly related to approximately 1,059,000 stock options granted to directors, executive officers and general and administrative employees in the three-month period ended March 31, 2018, of which 750,000 with a grant date fair value of $2.03 vested immediately. In the current period, 1,024,000 stock options were granted to directors, executive officers and general and administrative employees with a grant date fair value of $1.29. Stock options granted by the Company during the three months ended March 31, 2019, vest over four years, except for 335,000 options which vest after one year.

OFF-BALANCE SHEET ARRANGEMENTS

As at March 31, 2019, we are not party to any off-balance sheet arrangements.

CRITICAL ACCOUNTING POLICIES

Critical Accounting Policies and Estimates

We periodically review our financial reporting and disclosure practices and accounting policies to ensure that they provide accurate and transparent information relative to the current economic and business environment. As part of this process, we have reviewed our selection, application and communication of critical accounting policies and financial disclosures. Management has discussed the development and selection of the critical accounting policies with the Audit Committee of the Board of Directors and the Audit Committee has reviewed the disclosure relating to critical accounting policies in this Management's Discussion and Analysis.

Significant accounting judgments and estimates

A "critical accounting policy" is one which is both important to the portrayal of our financial condition and results and requires management's most difficult, subjective or complex judgments, often as a result of the need to make estimates about the effect of matters that are inherently uncertain. For additional information, please see the discussion of our significant accounting policies in Note 2 to the Financial Statements included in our Annual Report for the fiscal year ended December 31, 2018 on Form 10-K filed with the United States Securities Exchange Commission (the "SEC") on March 12, 2019. With the exception of the change to our accounting policy noted below as a result of the adoption of Accounting Standards Update, or ASU, No. 2016-02, Leases (Topic 842) there were no material changes to our critical accounting policies and estimates during the three months ended March 31, 2019.

Effective January 1, 2019, the Company adopted Financial Accounting Standards Board, or FASB, standard ASU No. 2016-02, "Leases (Topic 842)". The Company's operating leases of tangible property with terms greater than twelve months are recognized as right-of-use assets, which represents the lessee's right to use, or control the use of, a specified asset for the lease term, and a corresponding lease liability, which represents the lessee's obligation to make lease payments under a lease, measured on a discounted basis. The Company adopted the new standard using the alternative transition method, which permits a company to use its effective date as the date of initial application without restating comparative period financial statements. Landlord inducements in the form of free rent periods are netted against lease payments to the landlord in measuring right-of-use assets.

As a result of adopting Topic 842, we recorded as of January 1, 2019, a right-of-use asset of approximately $1.680 million, and a lease liability of approximately $1.757 million. Upon adoption, landlord inducements of approximately $78 thousand were de-recognized and a corresponding adjustment was made to right-of-use assets. The impact of the adopting Topic 842 on the Statement of Loss and Comprehensive Loss was nominal.

Management's assessment of our ability to continue as a going concern involves making a judgment, at a particular point in time, about inherently uncertain future outcomes and events or conditions. Please see the "Liquidity and Capital Resources" section in this Quarterly Report on Form 10-Q for a discussion of the factors considered by management in arriving at its assessment.

Other important accounting policies and estimates made by management are the valuation of contingent liabilities, the valuation of tax accounts, and the assumptions used in determining the valuation of share-based compensation.

Updated share information

As at May 7, 2019, we had 43,764,509 Common Shares issued and outstanding. In addition, there were 5,778,488 Common Shares issuable upon the exercise of outstanding stock options and upon the vesting of restricted share units.

ITEM 3. QUALITATIVE AND QUANTITATIVE DISCLOSURES ABOUT MARKET RISK

Under SEC rules and regulations, as a smaller reporting company, we are not required to provide this information.

ITEM 4. CONTROLS AND PROCEDURES

As of the end of our fiscal quarter ended March 31, 2019, an evaluation of the effectiveness of our "disclosure controls and procedures" (as such term is defined in Rules 13a-15(e) and 15d-15(e) under the United States Securities Exchange Act of 1934 (the "Exchange Act")) was carried out by our management, with the participation of our principal executive officer and principal financial officer. Based upon that evaluation, our principal executive officer and principal financial officer have concluded that as of the end of our fiscal quarter ended March 31, 2019, our disclosure controls and procedures are effective to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act is (i) recorded, processed, summarized and reported within the time periods specified in Securities and Exchange Commission rules and forms and (ii) accumulated and communicated to our management, including our principal executive officer and principal financial officers, to allow timely decisions regarding required disclosure.

It should be noted that while our principal executive officer and principal financial officer believe that our disclosure controls and procedures provide a reasonable level of assurance that they are effective, they do not expect that our disclosure controls and procedures or internal control over financial reporting will prevent all errors or fraud. A control system, no matter how well conceived or operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as such term is defined in Exchange Act Rule 13a-15(f). Internal control over financial reporting is a process designed under the supervision and with the participation of our management, including our principal executive and financial officer, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America.

As of March 31, 2019, our management assessed the effectiveness of our internal control over financial reporting using the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control-Integrated Framework (2013 Framework). Based on this assessment, our management concluded that, as of March 31, 2019, our internal control over financial reporting was effective based on those criteria. We are an "emerging growth company," as defined in the JOBS Act. For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies, including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act.

CHANGES IN INTERNAL CONTROL OVER FINANCIAL REPORTING

There were no changes in our internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act) during our fiscal quarter ended March 31, 2019 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II—OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

We are not currently party to any material legal proceedings.

ITEM 1A. RISK FACTORS

Risk Factors and Uncertainties

Any of the risks and uncertainties described below could significantly and negatively affect our business, prospects, financial condition, operating results, or credit ratings, which could cause the trading price of our Common Shares to decline. Additional risks and uncertainties not presently known to us, or risks that we currently consider immaterial, could also impair our business operations or financial condition. The following discussion of risk factors contains "forward-looking" statements, as discussed above. *We have marked with an asterisk (*) those risk factors that reflect changes from the risk factors included in our Annual Report on Form 10-K filed with the SEC on March 12, 2019.*

Risks Related to our Business

We are an early stage development company with no significant revenues from product sales.(*)

We are at an early stage of development. In the past five years, none of our potential products has obtained regulatory approval for commercial use and sale in any country and as such, no significant revenues have resulted from product sales. Significant additional investment will be necessary to complete the development of any of our product candidates. Preclinical and clinical trial work must be completed before our potential products could be ready for use within the markets that we have identified. We may fail to develop any products, obtain regulatory approvals, enter clinical trials or commercialize any products. We do not know whether any of our potential product development efforts will prove to be effective, meet applicable regulatory standards, obtain the requisite regulatory approvals, be capable of being manufactured at a reasonable cost or be accepted in the marketplace. We also do not know whether sales, license fees or related royalties will allow us to recoup any investment we make in the commercialization of our products.

The product candidates we are currently developing are not expected to be commercially viable for at least the next several years and we may encounter unforeseen difficulties or delays in commercializing our product candidates. In addition, our potential products may not be effective or may cause undesirable side effects.

Our product candidates require significant funding to reach regulatory approval assuming positive clinical results. For example, our product candidate APTO-253 began enrollment in a Phase Ib clinical trial in patients with relapsed or refractory AML and high risk MDS and was placed on clinical hold by the FDA following a voluntary suspension of dosing by us. That hold has been lifted, but significant additional funding will be necessary to complete the restarted Phase Ib clinical and, if required, Phase II or Phase III clinical trials. Similarly, we have recently received FDA approval to initiate a Phase 1 clinical trial with our product candidate CG-806 for patients with B-Cell Malignancies. Significant additional capital will be necessary to complete the Phase 1 clinical trial, and if required, Phase II or Phase III clinical trials. Such funding for our product candidates may be difficult, or impossible to raise in the public or private markets or through partnerships. If funding or partnerships are not readily attainable, the development of our product candidates may be significantly delayed or stopped altogether. The announcement of a delay or discontinuation of development would likely have a negative impact on our share price.

We need to raise additional capital.

We have an ongoing need to raise additional capital. To obtain the necessary capital, we must rely on some or all of the following: additional share issues, debt issuances (including promissory notes), collaboration agreements or corporate partnerships and grants and tax credits to provide full or partial funding for our activities. Additional funding may not be available on terms that are acceptable to us or in amounts that will enable us to carry out our business plan.

Our need for capital may require us to:

- engage in equity financings that could result in significant dilution to existing investors;
- delay or reduce the scope of or eliminate one or more of our development programs;
- obtain funds through arrangements with collaborators or others that may require us to relinquish rights to technologies, product candidates or products that we would otherwise seek to develop or commercialize ourselves;
- license rights to technologies, product candidates or products on terms that are less favorable to us than might otherwise be available;
- considerably reduce operations; or
- cease our operations.

We have a history of operating losses. We expect to incur net losses and we may never achieve or maintain profitability.

We have not been profitable since our inception in 1986. We reported net losses of $28.8 million in the fiscal year ended December 31, 2018, and $11.7 million in the fiscal year ended December 31, 2017, and as of December 31, 2018, we had an accumulated deficit of $276.0 million.

We have not generated any significant revenue to date and it is possible that we will never have sufficient product sales revenue (if any) to achieve profitability. We expect to continue to incur losses for at least the next several years as we or our collaborators and licensees pursue clinical trials and research and development efforts. To become profitable, we, either alone or with our collaborators and licensees, must successfully develop, manufacture and market our current product candidates APTO-253 or CG-806 as well as continue to identify, develop, manufacture and market new product candidates. It is possible that we will never have significant product sales revenue or receive royalties on our licensed product candidates. If funding is insufficient at any time in the future, we may not be able to develop or commercialize our products, take advantage of business opportunities or respond to competitive pressures.

We currently do not earn any revenues from our drug candidates and are therefore considered to be in the development stage. The continuation of our research and development activities and the commercialization of the targeted therapeutic products are dependent upon our ability to successfully finance and complete our research and development programs through a combination of equity financing and payments from strategic partners. We have no current sources of significant payments from strategic partners.

We heavily rely on the capabilities and experience of our key executives and scientists and the loss of any of them could affect our ability to develop our products.

The loss of our executive officers could harm our operations and our ability to achieve strategic objectives. While we have employment agreements with our Chief Executive Officer and our Chief Financial Officer, such employment agreements do not guarantee their retention. We also depend on our scientific and clinical collaborators and advisors, all of whom have outside commitments that may limit their availability to us. In addition, we believe that our future success will depend in large part upon our ability to attract and retain highly skilled scientific, managerial, medical, clinical and regulatory personnel, particularly as we expand our activities and seek regulatory approvals for clinical trials. We routinely enter into consulting agreements with our scientific and clinical collaborators and advisors, key opinion leaders and academic partners in the ordinary course of our business. We also enter into contractual agreements with physicians and institutions who will recruit patients into our clinical trials on our behalf in the ordinary course of our business. Notwithstanding these arrangements, we face significant competition for these types of personnel from other companies, research and academic institutions, government entities and other organizations. We cannot predict our success in hiring or retaining the personnel we require for continued growth. The loss of the services of any of our executive officers or other key personnel could potentially harm our business, operating results or financial condition.

Our employees may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements, which could have a material adverse effect on our business.

We are exposed to the risk of employee fraud or other misconduct. Misconduct by employees could include failures to comply with FDA/Health Canada regulations, provide accurate information to the FDA/Health Canada, comply with manufacturing standards we have established, comply with federal, state and provincial health-care fraud and abuse laws and regulations, report financial information or data accurately or disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Employee misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a substantial impact on our business and results of operations, including the imposition of substantial fines or other sanctions.

We have no sales, marketing or distribution experience and would have to invest significant financial and management resources to establish these capabilities.

We have no sales, marketing or distribution experience. We currently expect to rely heavily on third parties to launch and market our products, if they are approved. However, if we elect to develop internal sales, distribution and marketing capabilities, we will need to invest significant financial and management resources. For products where we decide to perform sales, marketing and distribution functions ourselves, we could face a number of additional risks, including:

- our inability to attract and build a significant marketing or sales force;
- the revenues generated by any particular product not justifying the cost of establishing a marketing or sales force; and
- the failure of our direct sales and marketing efforts.

If we are unable to develop our own sales, marketing and distribution capabilities, we will not be able to successfully commercialize our products without reliance on third parties.

We may expand our business through the acquisition of companies or businesses or by entering into collaborations or by in-licensing product candidates, each of which could disrupt our business and harm our financial condition.

We may in the future seek to expand our pipeline and capabilities by acquiring one or more companies or businesses, entering into collaborations or in-licensing one or more product candidates. For example, in June 2016, we entered into a definitive agreement with CG, granting Aptose an exclusive option to research, develop and commercialize CG-806 in all countries of the world except Korea, for all fields of use.

Acquisitions, collaborations and in-licenses involve numerous risks, including, but not limited to:

- substantial cash expenditures;
- technology development risks;
- potentially dilutive issuances of equity securities;

- incurrence of debt and contingent liabilities, some of which may be difficult or impossible to identify at the time of acquisition;
- difficulties in assimilating the operations of the acquired companies;
- potential disputes regarding contingent consideration;
- diverting our management's attention away from other business concerns;
- entering markets in which we have limited or no direct experience;
- potential loss of our key employees or key employees of the acquired companies or businesses; and
- failure of the in-licenses agents or technologies to deliver the desired activities or functions.

We have experience in entering collaborations and in-licensing product candidates; however, we cannot provide assurance that any acquisition, collaboration or in-license will result in short-term or long-term benefits to us. We may incorrectly judge the value or worth of an acquired company or business or in-licensed product candidate. In addition, our future success would depend in part on our ability to manage the rapid growth associated with some of these acquisitions, collaborations and in-licenses. We cannot assure you that we would be able to successfully combine our business with that of acquired businesses, manage a collaboration or integrate in-licensed product candidates. Furthermore, the development or expansion of our business may require a substantial capital investment by us.

Fluctuations in exchange rates can cause us to incur losses.

We may be exposed to fluctuations of the United States dollar against certain other currencies because we hold most of our cash and cash equivalents in United States dollars, while we incur some of our expenses in foreign currencies, primarily the Canadian dollar. Fluctuations in the value of currencies could cause us to incur currency exchange losses, and we do not currently employ a hedging strategy against exchange rate risk. As a result, changes in the exchange rate between the Canadian dollar and the U.S. dollar could materially impact our reported results of operations and distort period to period comparisons. In particular, to the extent that foreign currency-denominated (i.e., non-U.S. dollar) monetary assets do not equal the amount of our foreign currency denominated monetary liabilities, foreign currency gains or losses could arise and materially impact our financial statements. As a result of such foreign currency fluctuations, it could be more difficult to detect underlying trends in our business and results of operations. In addition, to the extent that fluctuations in currency exchange rates cause our results of operations to differ from our expectations or the expectations of our investors, the trading price of our Common Shares could be adversely affected.

Risks Related to Development, Clinical Testing and Regulatory Approval of Our Product Candidates (*)

Clinical trials are long, expensive and uncertain processes and the FDA or Health Canada may ultimately not approve any of our product candidates. We may never develop any commercial drugs or other products that generate revenues.

In the past five years, none of our product candidates has received regulatory approval for commercial use and sale in North America. We cannot market a pharmaceutical product in any jurisdiction until it has completed thorough preclinical testing and clinical trials in addition to that jurisdiction's extensive regulatory approval process. Approval in one country does not assure approval in another country. In general, significant research and development and clinical studies are required to demonstrate the safety and effectiveness of our product candidates before we can submit any regulatory applications.

Clinical trials are long, expensive and uncertain processes. Clinical trials may not be commenced or completed on schedule and the FDA or Health Canada or any other regulatory body may not ultimately approve our product candidates for commercial sale. The clinical trials of any of our drug candidates could be unsuccessful, which would prevent us from advancing, commercializing or partnering the drug.

Even if the results of our preclinical studies or clinical trials are initially positive, it is possible that we will obtain different results in the later stages of drug development or that results seen in clinical trials will not continue with longer term treatment. Positive results in Phase I clinical trials may not be repeated in larger Phase II or Phase III clinical trials.

Our preclinical studies and clinical trials may not generate positive results that will allow us to move towards the commercial use and sale of our product candidates. Furthermore, negative preclinical or clinical trial results may cause our business, financial condition, or results of operations to be materially adversely affected. For example, our Phase Ib clinical trial of APTO-253 in patients with relapsed or refractory AML and high risk MDS was placed on clinical hold by the FDA in November 2015 and since that time we have encountered manufacturing setbacks which further delayed the return of APTO-253 to the clinic. There can be no assurance that we will have the resources, or that we will decide, to continue the development of APTO-253. Even though the Phase Ib of APTO-253 has restarted , there is a long development path ahead that will take many years to complete and is prone to the risks of failure or delays inherent in drug development. Likewise, our CG-806 product candidate was recently approved for a Phase 1 clinical trial in patients with B-Cell malignancies, and it is expected to undergo many years of testing and regulatory examinations prior to any potential regulatory approvals.

Preparing, submitting and advancing applications for regulatory approval is complex, expensive and time intensive and entails significant uncertainty. A commitment of substantial resources to conduct time-consuming research, preclinical studies and clinical trials is required if we are to complete development of our products.

Clinical trials of our products require that we identify and enroll a large number of patients with the illness under investigation. We may not be able to enroll a sufficient number of appropriate patients to complete our clinical trials in a timely manner, particularly in smaller indications and indications where there is significant competition for patients. If we experience difficulty in enrolling a sufficient number of patients to conduct our clinical trials, we may need to delay or terminate ongoing clinical trials and will not accomplish objectives material to our success. Delays in planned patient enrollment or lower than anticipated event rates in our current clinical trials or future clinical trials also may result in increased costs, program delays, or both.

In addition, unacceptable toxicities or adverse side effects may occur at any time in the course of preclinical studies or human clinical trials or, if any product candidates are successfully developed and approved for marketing, during commercial use of any approved products. The appearance of any unacceptable toxicities or adverse side effects could interrupt, limit, delay or abort the development of any of our product candidates or, if previously approved, necessitate their withdrawal from the market. Furthermore, disease resistance or other unforeseen factors may limit the effectiveness of our potential products.

Our failure to develop safe, commercially viable drugs would substantially impair our ability to generate revenues and sustain our operations and would materially harm our business and adversely affect our share price.

We may not achieve our projected development goals in the time frames we announce and expect.

We set goals for, and make public statements regarding, the expected timing of the accomplishment of objectives material to our success, such as the submission of an Investigational New Drug (“IND”) application, the commencement and completion of clinical trials and the expected costs to develop our product candidates. The actual timing and costs of these events can vary dramatically due to factors within and beyond our control, such as delays or failures in our IND submissions or clinical trials, issues related to the manufacturing of drug supply, uncertainties inherent in the regulatory approval process, market conditions and interest by partners in our product candidates, among other things. We may not make regulatory submissions or receive regulatory approvals as planned; our clinical trials may not be completed; or we may not secure partnerships for any of our product candidates. Any failure to achieve one or more of these milestones as planned would have a material adverse effect on our business, financial condition and results of operations.

Delays in clinical testing could result in delays in commercializing our product candidates and our business may be substantially harmed.

We cannot predict whether any clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Our product development costs will increase if we experience delays in clinical testing. Significant clinical trial delays could shorten any periods during which we may have the exclusive right to commercialize our product candidates or allow our competitors to bring products to market before us, which would impair our ability to successfully commercialize our product candidates and may harm our financial condition, results of operations and prospects. The recommencement and completion of clinical trials for our products, including the APTO-253 Phase I clinical trial and Phase I clinical trial for CG-806, may be delayed for a number of reasons, including delays related, but not limited, to:

- failure by regulatory authorities to grant permission to proceed or placing the clinical trial on hold;
- patients failing to enroll or remain in our trials at the rate we expect;
- suspension or termination of clinical trials by regulators for many reasons, including concerns about patient safety or failure of our contract manufacturers to comply with Current Good Manufacturing Practice ("cGMP") requirements;
- any changes to our manufacturing process that may be necessary or desired;
- delays or failure to obtain GMP-grade clinical supply from contract manufacturers of our products necessary to conduct clinical trials;
- product candidates demonstrating a lack of safety or efficacy during clinical trials;
- patients choosing an alternative treatment for the indications for which we are developing any of our product candidates or participating in competing clinical trials;
- patients failing to complete clinical trials due to dissatisfaction with the treatment, side effects or other reasons;
- reports of clinical testing on similar technologies and products raising safety and/or efficacy concerns;
- competing clinical trials and scheduling conflicts with participating clinicians;
- clinical investigators not performing our clinical trials on their anticipated schedule, dropping out of a trial, or employing methods not consistent with the clinical trial protocol, regulatory requirements or other third parties not performing data collection and analysis in a timely or accurate manner;
- failure of our contract research organizations to satisfy their contractual duties or meet expected deadlines;
- inspections of clinical trial sites by regulatory authorities or IRBs , or ethics committees finding regulatory violations that require us to undertake corrective action, resulting in suspension or termination of one or more sites or the imposition of a clinical hold on the entire study;
- one or more IRBs or ethics committees rejecting, suspending or terminating the study at an investigational site, precluding enrollment of additional subjects, or withdrawing its approval of the trial; or
- failure to reach agreement on acceptable terms with prospective clinical trial sites.

Our product development costs will increase if we experience delays in testing or approval or if we need to perform more or larger clinical trials than planned. Additionally, changes in regulatory requirements and policies may occur, and we may need to amend study protocols to reflect these changes. Amendments may require us to resubmit our study protocols to regulatory authorities or IRBs or ethics committees for re-examination, which may impact the cost, timing or successful completion of that trial. Delays or increased product development costs may have a material adverse effect on our business, financial condition and prospects.

We rely on contract manufacturers over whom we have limited control. 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.

We rely on contract manufacturing organizations ("CMOs"), to manufacture our product candidates for some preclinical studies and clinical trials. We rely on CMOs for manufacturing, filling, packaging, storing and shipping of drug product in compliance with cGMP regulations applicable to our products. The FDA ensures the quality of drug products by carefully monitoring drug manufacturers' compliance with cGMP regulations. The cGMP regulations for drugs contain minimum requirements for the methods, facilities and controls used in manufacturing, processing and packing of a drug product.

We contracted with multiple CMOs for the manufacture of APTO-253 and CG-806 to supply drug supply and then drug product for our clinical trials. The synthesis of CG-806 drug supply is challenging from a scale-up synthetic chemistry perspective. The formulation and manufacture of APTO-253 is a complex process with many variables involved. We pre-qualified CMOs to have the capacity, the systems and the experience to supply CG-806 and APTO-253 for our clinical trials. We have qualified the manufacturing facilities and the FDA has also performed site audits for our selected CMOs. In spite of the efforts to prequalify CMOs, delays and errors may occur, and any such manufacturing failures, delays or compliance issues could cause delays in the completion of our clinical trial programs.

There can be no assurances that CMOs will be able to meet our timetable and requirements. We have contracted with alternate suppliers in the event our current CMOs are unable to scale up production, or if our current CMOs otherwise experience any other significant problems in the manufacture of CG-806 and APTO-253. However, it is possible that all third-party manufacturing sources may experience failure or delays and may demand commercially unreasonable terms, which may lead to further delays in the development of our product candidates. Further, contract manufacturers must operate in compliance with cGMP and failure to do so could result in, among other things, the disruption of product supplies. Our dependence upon third parties for the manufacture of our products may adversely affect our profit margins and our ability to develop and deliver products on a timely and competitive basis.

If we have difficulty enrolling patients in clinical trials, the completion of the trials may be delayed or cancelled.

As our product candidates advance from preclinical testing to clinical testing, and then through progressively larger and more complex clinical trials, we will need to enroll an increasing number of patients that meet our eligibility criteria. There is significant competition for recruiting cancer patients in clinical trials, and we may be unable to enroll the patients we need to complete clinical trials on a timely basis or at all. Certain factors that affect enrollment of patients onto our clinical trials are impacted by external forces that may be beyond our control. Such factors include, but are not limited to, the following:

- size and nature of the patient population;
- eligibility and exclusion criteria for the trial;
- design of the study protocol;
- competition with other companies for clinical sites or patients;
- the perceived risks and benefits of the product candidate under study;
- the patient referral practices of physicians; and
- the number, availability, location and accessibility of clinical trial sites.

If we are unable to successfully develop companion diagnostics for our therapeutic product candidates, or experience significant delays in doing so, we may not achieve marketing approval or realize the full commercial potential of our therapeutic product candidates.

We plan to develop companion diagnostics for our therapeutic product candidates. We expect that, at least in some cases, regulatory authorities may require the development and regulatory approval of a companion diagnostic as a condition to approving our therapeutic product candidates. We have limited experience and capabilities in developing or commercializing diagnostics and plan to rely in large part on third parties to perform these functions. We do not currently have any agreement in place with any third party to develop or commercialize companion diagnostics for any of our therapeutic product candidates.

Companion diagnostics are subject to regulation by the FDA, Health Canada and comparable foreign regulatory authorities as medical devices and may require separate regulatory approval or clearance prior to commercialization. If we, or any third parties that we engage to assist us, are unable to successfully develop companion diagnostics for our therapeutic product candidates, or experience delays in doing so, our business may be substantially harmed.

We rely and will continue to rely on third parties to conduct and monitor many of our preclinical studies and our clinical trials, and their failure to perform as required could cause substantial harm to our business.

We rely and will continue to rely on third parties to conduct a significant portion of our preclinical and clinical development activities. Preclinical activities include in vivo studies providing access to specific disease models, pharmacology and toxicology studies, and assay development. Clinical development activities include trial design, regulatory submissions, clinical patient recruitment, clinical trial monitoring, clinical data management and analysis, safety monitoring and project management, contract manufacturing and quality assurance. If there is any dispute or disruption in our relationship with third parties, or if they are unable to provide quality services in a timely manner and at a feasible cost, our active development programs will face delays. Further, if any of these third parties fails to perform as we expect or if their work fails to meet regulatory requirements, our testing could be delayed, cancelled or rendered ineffective.

Negative results from clinical trials or studies of others and adverse safety events involving the targets of our products may have an adverse impact on our future commercialization efforts.

From time to time, studies or clinical trials on various aspects of biopharmaceutical products are conducted by academic researchers, competitors or others. The results of these studies or trials, when published, may have a significant effect on the market for the biopharmaceutical product that is the subject of the study. The publication of negative results of studies or clinical trials or adverse safety events related to our product candidates, or the therapeutic areas in which our product candidates compete, could adversely affect our share price and our ability to finance future development of our product candidates, and our business and financial results could be materially and adversely affected.

The design or our execution of clinical trials may not support regulatory approval.

The design or execution of a clinical trial can determine whether its results will support regulatory approval and flaws in the design or execution of a clinical trial may not become apparent until the clinical trial is well advanced. In some instances, there can be significant variability in safety or efficacy results between different trials of the same product candidate due to numerous factors, including changes in trial protocols, differences in size and type of the patient populations, adherence to the dosing regimen and other trial protocols and the rate of dropout among clinical trial participants. We do not know whether any Phase II, Phase III or other clinical trials that we may conduct will demonstrate consistent or adequate efficacy and safety to obtain regulatory approval to market our product candidates.

Further, the FDA, Health Canada and comparable foreign regulatory authorities have substantial discretion in the approval process and in determining when or whether regulatory approval will be obtained for any of our product candidates. Our product candidates may not be approved even if they achieve their primary endpoints in future Phase III clinical trials or registration trials. The FDA, Health Canada or other regulatory authorities may disagree with our trial design and our interpretation of data from preclinical studies and clinical trials. In addition, any of these regulatory authorities may change requirements for the approval of a product candidate even after reviewing and providing comments or advice on a protocol for a pivotal Phase III clinical trial that has the potential to result in FDA, Health Canada or other agencies' approval. In addition, any of these regulatory authorities may also approve a product candidate for fewer or more limited indications than we request or may grant approval contingent on the performance of costly post-marketing clinical trials. The FDA, Health Canada or other regulatory authorities may not approve the labeling claims that we believe would be necessary or desirable for the successful commercialization of our product candidates.

As a result of intense competition and technological change in the biotechnical and pharmaceutical industries, the marketplace may not accept our products or product candidates, and we may not be able to compete successfully against other companies in our industry and achieve profitability.

Many of our competitors have:

- drug products that have already been approved or are in development, and operate large, well-funded research and development programs in the biotechnical and pharmaceutical fields;
- substantially greater financial, technical and management resources, stronger intellectual property positions and greater manufacturing, marketing and sales capabilities, areas in which we have limited or no experience; and
- significantly greater experience than we do in undertaking preclinical testing and clinical trials of new or improved pharmaceutical products and obtaining required regulatory approvals.

Consequently, our competitors may obtain FDA, Health Canada and other regulatory approvals for product candidates sooner and may be more successful in manufacturing and marketing their products than we or our collaborators are.

Our competitors' existing and future products, therapies and technological approaches will compete directly with the products we seek to develop. Current and prospective competing products may be more effective than our existing and future products insofar as they may provide greater therapeutic benefits for a specific problem or may offer easier delivery or comparable performance at a lower cost.

For CG-806 and APTO-253 in AML, examples of potential competitors include companies that have developed, approved or are currently developing inhibitors that directly target the wild type include AbbVie (IMBRUVICA) and AstraZeneca (CALQUENCE) and Beigene Co., Ltd,. (Zanubrutinib).

Others that are developing inhibitors that target the C481S-mutant BTK include Arqule, Inc. (ARQ 531), Roche, Sunesis Pharmaceuticals (SNS-062) and Eli Lilly amongst others.

For CG-806 and APTO-253 in AML, examples of potential competitors include companies that have developed, approved or are currently developing non-targeted therapies include Jazz (VYXEOS), Pfizer (MYLOTARG) and Roche (VENCLEXTA), among others. Others that have developed or are developing highly targeted therapies such as FLT-3 include Novartis (RYDAPT), Astellas (XOSAPTA), Daiichi Sankyo (QUIZARTINIB), Arog (CRENOLANIB), and IDH1 include Agios (TIBSOVO) and Celgene/BMS (IDHIFA) among others.

Any product candidate that we develop and that obtains regulatory approval must then compete for market acceptance and market share. Our products may not gain market acceptance among physicians, patients, healthcare payers, insurers, the medical community and other stakeholders. The degree of market acceptance of our product candidates, if approved for commercial sale, will depend on a number of factors, including:

- efficacy and potential advantages compared to alternative treatments;
- the ability to offer its product candidates for sale at competitive prices;
- convenience and ease of administration compared to alternative treatments;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the strength of marketing and distribution support;
- sufficient third-party coverage or reimbursement; and
- the prevalence and severity of any side effects.

Further, any products we develop may become obsolete before we recover any expenses we incurred in connection with the development of these products. As a result, we may never achieve profitability.

Risks Related to our Intellectual Property

We may be unable to obtain patents to protect our technologies from other companies with competitive products, and patents of other companies could prevent us from manufacturing, developing or marketing our products.

Patent protection

The patent positions of pharmaceutical and biotechnology companies are uncertain and involve complex legal and factual questions. The USPTO and many other patent offices in the world have not established a consistent policy regarding the breadth of claims that they will allow in biotechnology patents.

Our pending patent applications may not result in issued patents and our issued patents may not be held valid and enforceable if challenged. Competitors may be able to circumvent any such issued patents by adoption of a competitive, though non-infringing product or process. Interpretation and evaluation of pharmaceutical or biotechnology patent claims present complex and often novel legal and factual questions. Our business could be adversely affected by increased competition in the event that any patent granted to it is held to be invalid or unenforceable or is inadequate in scope to protect our operations.

Allowable patentable subject matter and the scope of patent protection obtainable may differ between jurisdictions. If a patent office allows broad claims, the number and cost of patent interference proceedings in the United States, or analogous proceedings in other jurisdictions and the risk of infringement litigation may increase. If it allows narrow claims, the risk of infringement may decrease, but the value of our rights under our patents, licenses and patent applications may also decrease.

The scope of the claims in a patent application can be significantly modified during prosecution before the patent is issued. Consequently, we cannot know whether our pending applications will result in the issuance of patents or, if any patents are issued, whether they will provide us with significant proprietary protection or will be circumvented, invalidated or found to be unenforceable.

Publication of discoveries in scientific or patent literature often lags behind actual discoveries. Patent applications filed in the United States generally will be published 18 months after the filing date unless the applicant certifies that the invention will not be the subject of a foreign patent application. In many other jurisdictions, such as Canada, patent applications are published 18 months from the priority date. We may not be aware of such literature. Accordingly, we cannot be certain that the named inventors of our products and processes were the first to invent that product or process or that we were the first to pursue patent coverage for our inventions.

In addition, United States patent laws may change, which could prevent or limit us from filing patent applications or patent claims in the United States to protect our products and technologies or limit the exclusivity periods that are available to patent holders for United States patents. For example, the Leahy-Smith America Invents Act, (the "Leahy-Smith Act") was signed into law in 2011 and includes a number of significant changes to United States patent law. These include changes to transition from a "first-to-invent" system to a "first-to-file" system and to the way issued patents are challenged. These changes may favor larger and more established companies that have more resources to devote to patent application filing and prosecution. It is not clear what, if any, impact the Leahy-Smith Act will ultimately have on the cost of prosecuting our patent applications in the United States, our ability to obtain patents in the United States based on our discoveries and our ability to enforce or defend our United States issued patents.

Until such time, if ever, that further patents are issued to us, we will rely upon the law of trade secrets to the extent possible given the publication requirements under international patent treaty laws and/or requirements under foreign patent laws to protect our technology and our products incorporating the technology. In this regard, we have adopted certain confidentiality procedures. These include: limiting access to confidential information to certain key personnel; requiring all directors, officers, employees and consultants and others who may have access to our intellectual property to enter into confidentiality agreements which prohibit the use of or disclosure of confidential information to third parties; and implementing physical security measures designed to restrict access to such confidential information and products. Our ability to maintain the confidentiality of our technology is crucial to our ultimate possible commercial success. The procedures adopted by us to protect the confidentiality of our technology may not be effective, third parties may gain access to our trade secrets or our trade secrets or those of our collaborators may be independently discovered by others. Our collaborators, employees and consultants and other parties may not comply with the terms of their agreements with us, and we might be unable to adequately enforce our rights or obtain adequate compensation for the damages caused by unauthorized disclosure or use of our trade secrets or know how. Further, by seeking patent protection in various countries, it is inevitable that a substantial portion of our technology will become available to our competitors, through publication of such patent applications.

Enforcement of intellectual property rights

Protection of the rights revealed in published patent applications can be complex, costly and uncertain. Our commercial success depends in part on our ability to maintain and enforce our proprietary rights. If third parties engage in activities that infringe on our proprietary rights, our management's focus will be diverted and we may incur significant costs in asserting our rights. We may not be successful in asserting our proprietary rights, which could result in our patents being held invalid or a court holding that the third party is not infringing, either of which would harm our competitive position.

Others may design around our patented technology. We may have to participate in interference proceedings declared by the USPTO, European opposition proceedings, or other analogous proceedings in other parts of the world to determine priority of invention and the validity of patent rights granted or applied for, which could result in substantial cost and delay, even if the eventual outcome is favorable to us. Our pending patent applications, even if issued, may not be held valid or enforceable.

Our products and product candidates may infringe the intellectual property rights of others, or others may infringe on our intellectual property rights, which could increase our costs.

Our success also depends on avoiding infringement of the proprietary technologies of others. In particular, there may be certain issued patents and patent applications claiming subject matter which we or our collaborators may be required to license in order to research, develop or commercialize APTO-253 or CG-806. In addition, third parties may assert infringement or other intellectual property claims against us. An adverse outcome in these proceedings could subject us to significant liabilities to third-parties, require disputed rights to be licensed from third-parties or require us to cease or modify our use of the technology. If we are required to license third-party technology, a license under such patents and patent applications may not be available on acceptable terms or at all. Further, we may incur substantial costs defending ourselves in lawsuits against charges of patent infringement or other unlawful use of another's proprietary technology. We may also need to bring claims against others who we believe are infringing our rights in order to become or remain competitive and successful. Any such claims can be time consuming and expensive to pursue.

We may incur substantial cost in defending our intellectual property.

While we believe that our products and technology do not infringe on the proprietary rights of others, third parties may assert infringement claims in the future and such claims could be successful. Even if challenges are unsuccessful, we could incur substantial costs in defending ourselves against patent infringement claims brought by others or in prosecuting suits against others. In addition, others may obtain patents that we would need to license, which may not be available to us on reasonable terms. Whether we are able to obtain a necessary license would depend on the terms offered, the degree of risk of infringement and the need for the patent.

We have licensed important portions of our intellectual property from CG, and are subject to significant obligations under that license agreement.

The rights we hold under our license agreement with CG are critical to our business. Our CG-806 program is built around patents exclusively in-licensed from CG, which permit us to research, develop and commercialize CG-806 worldwide except for the Republic of Korea. Under our agreement with CG, we are subject to significant obligations, including diligence obligations with respect to development and commercialization activities, payment obligations upon achievement of certain milestones and royalties on product sales, as well as other material obligations. CG is eligible for payments upon the achievement of developmental, regulatory and commercial-based milestones, as well as low single-digit royalties on product sales in all territories outside of the Republic of Korea.

If there is any conflict, dispute, disagreement or issue of non-performance between us and CG regarding our rights or obligations under the license agreements, including any conflict, dispute or disagreement arising from our failure to satisfy diligence or payment obligations under such agreements, CG may have a right to terminate the license. The loss of this license agreement could materially and adversely affect our ability to use intellectual property that could be critical to our drug discovery and development efforts, as well as our ability to enter into future collaboration, licensing and/or marketing agreements for one or more affected drug candidates or development programs.

Our business depends, in part, on our ability to use technology that we have licensed or will in the future license from third parties, including CG, and, if these licenses were terminated or if we were unable to license additional technology we may need in the future, our business would be adversely affected.

We currently hold licenses for certain technologies that are or may be critical to our current and subsequent product candidates. These include our exclusive license to research, develop and commercialize CG-806 worldwide except for the Republic of Korea. The license from CG is subject to termination in the event of a breach by us of the license, if we fail to cure the breach following notice and the passage of a cure period. We may need to acquire additional licenses in the future to technologies developed by others. Furthermore, future license agreements may require us to make substantial milestone payments. We may also be obligated to make royalty payments on the sales, if any, of products resulting from the license. The termination of a license or the inability to license future technologies on acceptable terms may adversely affect our ability to develop or sell our products.

Legal and Regulatory Risk

Our ability to develop, produce and market our products is subject to extensive government regulation.

Government regulation is a significant factor in the development, production and marketing of our products. Research and development, testing, manufacture, marketing and sales of pharmaceutical products or related products are subject to extensive regulatory oversight, often in multiple jurisdictions, which may cause significant additional costs and/or delays in bringing products to market, and in turn, may cause significant losses to investors. The regulations applicable to our product candidates may change. Even if granted, regulatory approvals may include significant limitations on the uses for which products can be marketed or may be conditioned on the conduct of post-marketing surveillance studies. Failure to comply with applicable regulatory requirements can, among other things, result in warning letters, the imposition of civil penalties or other monetary payments, delay in approving or refusal to approve a product candidate, suspension or withdrawal of regulatory approval, product recall or seizure, operating restrictions, interruptions of clinical trials or manufacturing, injunctions or criminal prosecution. In addition, regulatory agencies may not approve the labeling claims that are necessary or desirable for the successful commercialization of our product candidates.

Requirements for regulatory approval vary widely from country to country. Whether or not approved in Canada or the United States, regulatory authorities in other countries must approve a product prior to the commencement of marketing the product in those countries. The time required to obtain any such approval may be longer or shorter than in Canada or the United States. Approved drugs, as well as their manufacturers, are subject to continuing and ongoing review, and discovery of problems with these products or the failure to adhere to manufacturing or quality control requirements may result in regulatory restrictions being imposed.

Recently enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize our product candidates and affect the prices we may obtain.

In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could, among other things, prevent or delay marketing approval of our product candidates, restrict or regulate post approval activities and affect our ability to profitably sell any products for which we obtain marketing approval.

For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care Education Reconciliation Act, or collectively the Affordable Care Act, was enacted to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against fraud and abuse, add new transparency requirements for health care and health insurance industries, impose new taxes and fees on the health industry and impose additional health policy reforms. Additionally, the Drug Supply Chain Security Act, enacted in 2013, imposed new obligations on manufacturers of pharmaceutical products related to product tracking and tracing.

Members of Congress and the Trump Administration have considered legislation to fundamentally change or repeal the Affordable Care Act. While Congress has not passed repeal legislation to date, the Tax Cuts and Jobs Act ("TCJA") includes a provision repealing the individual insurance coverage mandate included in the Affordable Care Act, effective January 1, 2019. Further, President Trump signed an Executive Order directing federal agencies with authorities and responsibilities under the Affordable Care Act to waive, defer, grant exemptions from, or delay the implementation of any provision of the Affordable Care Act that would impose a fiscal or regulatory burden on states, individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices. On October 13, 2017, the President signed an Executive Order terminating the cost-sharing subsidies that reimburse insurers under the Affordable Care Act. Several state Attorneys General filed suit to stop the administration from terminating the subsidies, but their request for a restraining order was denied by a federal judge in California on October 25, 2017. In addition, the Centers for Medicare and Medicaid Services has recently proposed regulations that would give states greater flexibility in setting benchmarks for insurers in the individual and small group marketplaces, which may have the effect of relaxing the essential health benefits required under the Affordable Care Act for plans sold through such marketplaces. Congress may consider other legislation to replace elements of the Affordable Care Act. The implications of the Affordable Care Act, its possible repeal, any legislation that may be proposed to replace the Affordable Care Act, or the political uncertainty surrounding any repeal or replacement legislation for our business and financial condition, if any, are not yet clear.

We cannot predict what healthcare reform initiatives may be adopted in the future. Further federal and state legislative and regulatory developments are likely, and we expect ongoing initiatives in the United States to increase pressure on drug pricing. Such reforms could have an adverse effect on anticipated revenues from product candidates that we may successfully develop and for which we may obtain regulatory approval and may affect our overall financial condition and ability to develop drug candidates.

Legislative and regulatory proposals have also been made to expand post approval requirements and restrict sales and promotional activities for pharmaceutical products. Any healthcare reforms enacted in the future may, like the Affordable Care Act, be phased in over a number of years but, if enacted, could reduce our revenue, increase our costs, or require us to revise the ways in which we conduct business or put us at risk for loss of business. We are not sure whether additional legislative changes will be enacted, or whether the current regulations, guidance or interpretations will be changed, or what the impact of such changes on our business, if any, may be.

Coverage and adequate reimbursement may not be available for our product candidates, which could make it difficult for us to sell our products profitably.

Market acceptance and sales of any drug candidates that we develop will depend in part on the extent to which reimbursement for these products and related treatments will be available from third party payors, including government health administration authorities and private health insurers. Third party payors decide which drugs they will pay for and establish reimbursement levels. Third party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement policies. However, decisions regarding the extent of coverage and amount of reimbursement to be provided for each of our drug candidates will be made on a plan by plan basis. One payor's determination to provide coverage for a product does not assure that other payors will also provide coverage, and adequate reimbursement, for the product. Additionally, a third party payor's decision to provide coverage for a drug does not imply that an adequate reimbursement rate will be approved. Each plan determines whether or not it will provide coverage for a drug, what amount it will pay the manufacturer for the drug, and on what tier of its formulary the drug will be placed. The position of a drug on a formulary generally determines the copayment that a patient will need to make to obtain the drug and can strongly influence the adoption of a drug by patients and physicians. Patients who are prescribed treatments for their conditions and providers performing the prescribed services generally rely on third party payors to reimburse all or part of the associated healthcare costs. Patients are unlikely to use our products unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our products.

A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Third party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. We cannot be sure that coverage and reimbursement will be available for any product that we commercialize and, if reimbursement is available, what the level of reimbursement will be. Inadequate coverage and reimbursement may impact the demand for, or the price of, any product for which we obtain marketing approval. If coverage and adequate reimbursement is not available, or is available only to limited levels, we may not be able to successfully commercialize any drug candidates that we develop.

Additionally, there have been a number of legislative and regulatory proposals to change the healthcare system in the United States and in some foreign jurisdictions that could affect our ability to sell any future drugs profitably. These legislative and regulatory changes may negatively impact the reimbursement for any future drugs, following approval.

We are subject to U.S. and Canadian healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm, fines, disgorgement, exclusion from participation in government healthcare programs, curtailment or restriction of our operations and diminished profits and future earnings.

Healthcare providers, physicians and others will play a primary role in the recommendation and prescription of any products for which we obtain marketing approval. Our future arrangements with healthcare providers, patients and third party payors will expose us to broadly applicable U.S. and Canadian fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and collaborative partners through which we market, sell and distribute any products for which we obtain marketing approval.

Efforts to ensure that our collaborations with third parties, and our business generally, will comply with applicable U.S. and Canadian healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental laws and regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion of products from government funded healthcare programs, contractual damages, reputational harm, disgorgement, curtailment or restricting of our operations, any of which could substantially disrupt our operations and diminish our profits and future earnings. If any of the physicians or other providers or entities with whom we expect to do business is found not to be in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs. The risk of our being found in violation of these laws is increased by the fact that many of them have not been fully interpreted by the regulatory authorities or the courts, and their provisions are open to a variety of interpretations.

If product liability, clinical trial liability or environmental liability claims are brought against us or we are unable to obtain or maintain product liability, clinical trial or environmental liability insurance, we may incur substantial liabilities that could reduce our financial resources.

The clinical testing and commercial use of pharmaceutical products involves significant exposure to product liability, clinical trial liability, environmental liability and other risks that are inherent in the testing, manufacturing and marketing of our products. These liabilities, if realized, could have a material adverse effect on our business, results of operations and financial condition.

We have obtained limited product liability insurance coverage for our clinical trials on humans; however, our insurance coverage may be insufficient to protect us against all product liability damages. Regardless of merit or eventual outcome, liability claims may result in decreased demand for a future product, injury to reputation, withdrawal of clinical trial volunteers, loss of revenue, costs of litigation, distraction of management and substantial monetary awards to plaintiffs. Additionally, if we are required to pay a product liability claim, we may not have sufficient financial resources to complete development or commercialization of any of our product candidates and our business and results of operations will be adversely affected. In general, insurance will not protect us against some of our own actions, such as negligence.

As our development activities progress towards the commercialization of product candidates, our liability coverage may not be adequate, and we may not be able to obtain adequate product liability insurance coverage at a reasonable cost, if at all. Even if we obtain product liability insurance, our financial position may be materially adversely affected by a product liability claim. A product liability claim could also significantly harm our reputation and delay market acceptance of our product candidates. Additionally, product recalls may be issued at the direction of the FDA, other government agencies or other companies having regulatory control for pharmaceutical sales. If a product recall occurs in the future, such a recall could adversely affect our business, financial condition or reputation.

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could have a material adverse effect on the success of our business.

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and radioactive and biological materials. Our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials. In the event of contamination or injury resulting from our use of hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties.

Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological, hazardous or radioactive materials.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

We may be unable to obtain partnerships for our product candidates, which could curtail future development and negatively affect our share price. In addition, our partners might not satisfy their contractual responsibilities or devote sufficient resources to our partnership.

Our strategy for the research, development and commercialization of our products requires entering into various arrangements with corporate collaborators, licensors, licensees and others, and our commercial success is dependent upon these outside parties performing their respective contractual responsibilities. The amount and timing of resources that such third parties will devote to these activities may not be within our control. These third parties may not perform their obligations as expected and our collaborators may not devote adequate resources to our programs. In addition, we could become involved in disputes with our collaborators, which could result in a delay or termination of the related development programs or result in litigation. We intend to seek additional collaborative arrangements to develop and commercialize some of our products. We may not be able to negotiate collaborative arrangements on favorable terms, or at all, in the future, and our current or future collaborative arrangements may not be successful.

If we cannot negotiate collaboration, license or partnering agreements, we may never achieve profitability and we may not be able to continue to develop our product candidates. Commencing Phase I, Phase II and Phase III clinical trials for CG-806 and continuing Phase Ib, and commencing Phase II and Phase III clinical trials for APTO-253 would require significant amounts of funding and such funding may not be available to us.

Risks Related to Our Common Shares

Our share price has been and is likely to continue to be volatile and an investment in our Common Shares could suffer a decline in value.

You should consider an investment in our Common Shares as risky and invest only if you can withstand a significant loss and wide fluctuations in the market value of your investment. The market price of our Common Shares has been highly volatile and is likely to continue to be volatile. This leads to a heightened risk of securities litigation pertaining to such volatility. Factors affecting our Common Share price include but are not limited to:

- our ability to continue as a going concern;
- our ability to raise additional capital;
- the progress of our pre-clinical and clinical trials;
- our ability to obtain partners and collaborators to assist with the future development of our products;
- general market conditions;
- announcements of technological innovations or new product candidates by us, our collaborators or our competitors;
- published reports by securities analysts;
- developments in patent or other intellectual property rights;
- the cash and investments held by us and our ability to secure future financing;
- public concern as to the safety and efficacy of drugs that we and our competitors develop;
- shareholder interest in our Common Shares; and
- low liquidity in the daily trading volume of our Common Shares.

Future sales of our Common Shares by us or by our existing shareholders could cause our share price to fall.

The issuance of Common Shares by us could result in significant dilution in the equity interest of existing shareholders and adversely affect the market price of our Common Shares. Sales by existing shareholders of a large number of our Common Shares in the public market and the issuance of Common Shares in connection with strategic alliances, or the perception that such additional sales could occur, could cause the market price of our Common Shares to decline and have an undesirable impact on our ability to raise capital.

We are susceptible to stress in the global economy and therefore, our business may be affected by the current and future global financial conditions.

If the increased level of volatility and market turmoil that have marked recent years continue, our operations, business, financial condition and the trading price of our Common Shares could be materially adversely affected. Furthermore, general economic conditions may have a great impact on us, including our ability to raise capital, our commercialization opportunities and our ability to establish and maintain arrangements with others for research, manufacturing, product development and sales.

An active trading market in our Common Shares may not be sustained.

Our Common Shares are listed for trading on the Nasdaq Capital Market and the TSX. However, an active trading market in our Common Shares on the stock exchanges may not be sustained and we may not be able to maintain our listings.

Certain Canadian laws could delay or deter a change of control.

Limitations on the ability to acquire and hold our Common Shares may be imposed by the Competition Act in Canada. This legislation permits the Commissioner of Competition of Canada to review any acquisition of a significant interest in us. This legislation grants the Commissioner jurisdiction to challenge such an acquisition before the Canadian Competition Tribunal if the Commissioner believes that it would, or would be likely to, result in a substantial lessening or prevention of competition in any market in Canada. The Investment Canada Act subjects an acquisition of control of a company by a non-Canadian to government review if the value of our assets, as calculated pursuant to the legislation, exceeds a threshold amount. A reviewable acquisition may not proceed unless the relevant minister is satisfied that the investment is likely to result in a net benefit to Canada. Any of the foregoing could prevent or delay a change of control and may deprive or limit strategic opportunities for our shareholders to sell their shares.

The exercise of all or any number of outstanding stock options, the award of any additional options, restricted stock units or other stock-based awards or any issuance of shares to raise funds or acquire a business may dilute your Common Shares.

We have in the past and may in the future grant to some or all of our directors, officers and employees options to purchase our Common Shares and other stock-based awards as non-cash incentives to those persons. The issuance of any equity securities could, and the issuance of any additional shares would, cause our existing shareholders to experience dilution of their ownership interests.

Any additional issuance of shares or a decision to acquire other businesses through the sale of equity securities may dilute our investors' interests, and investors may suffer dilution in their net book value per share depending on the price at which such securities are sold. Such issuance may cause a reduction in the proportionate ownership and voting power of all other shareholders. The dilution may result in a decline in the price of our Common Shares or a change in control.

We do not expect to pay dividends for the foreseeable future.

We have not paid any cash dividends to date and we do not intend to declare dividends for the foreseeable future, as we anticipate that we will reinvest future earnings, if any, in the development and growth of our business. Therefore, investors will not receive any funds unless they sell their Common Shares, and shareholders may be unable to sell their shares on favorable terms or at all. We cannot assure you of a positive return on investment or that you will not lose the entire amount of your investment in our Common Shares. Prospective investors seeking or needing dividend income or liquidity should not purchase our Common Shares.

Other Risks

It may be difficult for non-Canadian investors to obtain and enforce judgments against us because of our Canadian incorporation and presence.

We are a corporation existing under the laws of Canada. Some of our directors and officers, and many of the experts named in this Quarterly Report on Form 10-Q, are residents of Canada, and all or a substantial portion of their assets, and a substantial portion of our assets, are located outside the United States. Consequently, although we have appointed an agent for service of process in the United States, it may be difficult for holders of our shares who reside in the United States to effect service within the United States upon our directors and officers and experts who are not residents of the United States. It may also be difficult for holders of our shares who reside in the United States to realize in the United States upon judgments of courts of the United States predicated upon our civil liability and the civil liability of our directors, officers and experts under the United States federal securities laws. Investors should not assume that Canadian courts (i) would enforce judgments of United States courts obtained in actions against us or our directors, officers or experts predicated upon the civil liability provisions of the United States federal securities laws or the securities or "blue sky" laws of any state within the United States or (ii) would enforce, in original actions, liabilities against us or our directors, officers or experts predicated upon the United States federal securities laws or any such state securities or "blue sky" laws. In addition, we have been advised by our Canadian counsel that in normal circumstances, only civil judgments, and not other rights arising from United States securities legislation, are enforceable in Canada and that the protections afforded by Canadian securities laws may not be available to investors in the United States.

We are likely a "passive foreign investment company" which may have adverse United States federal income tax consequences for United States shareholders.

United States investors in our Common Shares should be aware that we believes the Company was classified as a passive foreign investment company ("PFIC") during the tax year ended December 31, 2017, and based on the nature of our business, the projected composition of our gross income and the projected composition and estimated fair market value of our assets, we expect to be a PFIC for the current tax year ending December 31, 2018 and may be a PFIC in subsequent tax years. If the Company is a PFIC for any year during a United States shareholder's holding period, then such United States shareholder generally will be required to treat any gain realized upon a disposition of Common Shares, or any so-called "excess distribution" received on its Common Shares, as ordinary income, and to pay an interest charge on a portion of such gain or distributions, unless the shareholder makes a timely and effective "qualified electing fund" election ("QEF election") or a "mark-to-market" election with respect to the Common Shares. A United States shareholder who makes a QEF election generally must report on a current basis its share of the Company's net capital gain and ordinary earnings for any year in which we are a PFIC, whether or not we distribute any amounts to its shareholders. However, United States shareholders should be aware that we do not intend to satisfy record keeping requirements that apply to a qualified electing fund, and we do not intend to supply United States shareholders with information that such United States shareholders require to report under the QEF election rules, in the event that we are a PFIC and a United States shareholder wishes to make a QEF election. Thus, United States shareholders should assume that they will not be able to make a QEF election with respect to their Common Shares. A United States shareholder who makes the mark-to-market election generally must include as ordinary income each year the excess of the fair market value of the Common Shares over the taxpayer's basis therein. Each United States shareholder should consult its own tax advisor regarding the United States federal, United States local, and foreign tax consequences of the PFIC rules and the acquisition, ownership, and disposition of our Common Shares.

We are an "emerging growth company," and we cannot be certain if the reduced reporting requirements applicable to emerging growth companies will make our Common Shares less attractive to investors.

We are an "emerging growth company," as defined in the Jumpstart Our Business Startups Act of 2012 (the "JOBS Act"). For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies, including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002 ("SOX"), reduced disclosure obligations regarding executive compensation in our periodic reports and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved.

We will cease to be an emerging growth company upon the earliest of:

- the last day of the fiscal year during which we have total annual gross revenues of $1,000,000,000 (as such amount is indexed for inflation every five years by the SEC or more;
- the last day of our fiscal year following the fifth anniversary of the completion of our first sale of common equity securities pursuant to an effective registration statement under the Securities Act of 1933, as amended(the "Securities Act"), which will be in September 2020;
- the date on which we have, during the previous three-year period, issued more than $1,000,000,000 in non- convertible debt; or
- the date on which we are deemed to be a "large accelerated filer", as defined in Rule 12b–2 of the Exchange Act , which would occur if the market value of our ordinary shares that are held by non-affiliates exceeds $700,000,000 as of the last day of our most recently-completed second fiscal quarter.

We cannot predict if investors will find our Common Shares less attractive because we may rely on these exemptions. If some investors find our Common Shares less attractive as a result, there may be a less active trading market for our Common Shares and our share price may be more volatile.

Any failure to maintain an effective system of internal controls may result in material misstatements of our consolidated financial statements or cause us to fail to meet our reporting obligations or fail to prevent fraud; and in that case, our shareholders could lose confidence in our financial reporting, which would harm our business and could negatively impact the price of our Common Shares.

Section 404(a) of SOX requires that our management assess and report annually on the effectiveness of our internal controls over financial reporting and identify any material weaknesses in our internal controls over financial reporting. Although Section 404(b) of SOX requires our independent registered public accounting firm to issue an annual report that addresses the effectiveness of our internal controls over financial reporting, we have opted to rely on the exemptions provided to us by virtue of being an emerging growth company, and consequently will not be required to comply with SEC rules that implement Section 404(b) of SOX until we lose our emerging growth company status.

Effective internal controls are necessary for us to provide reliable financial reports and prevent fraud. If we fail to maintain an effective system of internal controls, we might not be able to report our financial results accurately or prevent fraud; and in that case, our shareholders could lose confidence in our financial reporting, which would harm our business and could negatively impact the price of our Common Shares. While we believe that we have sufficient personnel and review procedures to allow us to maintain an effective system of internal controls, we cannot assure you that we will not experience potential material weaknesses in our internal control. Even if we conclude that our internal control over financial reporting provides reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements for external purposes in accordance with International Financial Reporting Standards, as issued by the International Accounting Standards Board, because of its inherent limitations, internal control over financial reporting may not prevent or detect fraud or misstatements. Failure to implement required new or improved controls, or difficulties encountered in their implementation, could harm our results of operations or cause us to fail to meet our future reporting obligations.

If we fail to timely achieve and maintain the adequacy of our internal control over financial reporting, we may not be able to produce reliable financial reports or help prevent fraud. Our failure to achieve and maintain effective internal control over financial reporting could prevent us from complying with our reporting obligations on a timely basis, which could result in the loss of investor confidence in the reliability of our consolidated financial statements, harm our business and negatively impact the trading price of our Common Shares.

Prior to December 31, 2018, we were a foreign private issuer and were therefore not subject to certain United States securities law disclosure requirements that apply to a domestic United States issuer, which may limit the historical information publicly available to our shareholders.

As a foreign private issuer prior to December 31, 2018, we were exempt from certain rules under the Exchange Act that impose disclosure requirements as well as procedural requirements for proxy solicitations under Section 14 of the Exchange Act. In addition, our officers, directors and principal shareholders were exempt from the reporting and "short-swing" profit recovery provisions of Section 16 of the Exchange Act. Moreover, we were not required to file periodic reports and financial statements with the SEC as frequently or as promptly as a company that files as a domestic issuer whose securities are registered under the Exchange Act, nor were we generally required to comply with the SEC's Regulation Fair Disclosure, which restricts the selective disclosure of material non-public information. For as long as we were a "foreign private issuer" we filed our annual financial statements on Form 20-F and furnished our quarterly updates on Form 6-K to the SEC. However, the information we filed or furnished was not the same as the information required in annual and quarterly reports on Form 10-K or Form 10-Q for United States domestic issuers. Accordingly, there may be less historical information publicly available concerning us than there is for a company that has filed as a domestic issuer for longer.

Data security incidents and privacy breaches could result in important remediation costs, increased cyber security costs, litigation and reputational harm.

Cyber security incidents can result from deliberate attacks or unintentional events. Cyber-attacks and security breaches could include unauthorized attempts to access, disable, improperly modify or degrade our information, systems and networks, the introduction of computer viruses and other malicious codes and fraudulent "phishing" emails that seek to misappropriate data and information or install malware onto users' computers. Cyber-attacks in particular vary in technique and sources, are persistent, frequently change and are increasingly more targeted and difficult to detect and prevent. Our network security and data recovery measures and those of third parties with which we contract, may not be adequate to protect against cyber-attacks.

Disruptions due to cyber security incidents could adversely affect Aptose's business. In particular, a cyber security incident could result in the loss or corruption of data from Aptose's research and development activities, including clinical trials, which may cause significant delays to some or all of our clinical programs. Also, our trade secrets, including unpatented know how, technology and other proprietary information could be disclosed to competitors as a result of a breach, which would harm our business and competitive position. We expect that risks and exposures related to cyber security attacks will remain high for the foreseeable future due to the rapidly evolving nature and sophistication of these threats. While we have invested in the protection of data and information technology, there can be no assurance that our efforts to implement adequate security measures would be sufficient to protect us against cyber-attacks.

We may fail to successfully upgrade and maintain our information technology systems.

We rely on various information technology systems to manage our operations. There are inherent costs and risks associated with maintaining, modifying and/or changing these systems and implementing new systems, including potential disruption of our internal control structure, substantial capital expenditures, additional administration and operating expenses, retention of sufficiently skilled personnel to implement and operate its systems, demands on management time and other risks and costs of delays or difficulties in transitioning to new systems or of integrating new systems into our current systems. In addition, our information technology system implementations may not result in productivity improvements at a level that outweighs the costs of implementation, or at all. The implementation of new information technology systems may also cause disruptions in our business operations and have an adverse effect on our business, prospects, financial condition and operating results.

Item 5. Other Information

On May 7, 2019, we entered into a Common Shares Purchase Agreement (the "Purchase Agreement") with Aspire Capital Fund, LLC ("Aspire Capital"), under which Aspire Capital has, subject to applicable stock exchange approval, committed to purchase up to US$20 million of our common shares, at our request from time to time for up to 30 months. Under the Purchase Agreement, we will have the right, on any business day, to direct Aspire Capital to purchase up to 200,000 common shares with a value not exceeding US$500,000. However, upon mutual agreement, we will be permitted to direct Aspire Capital to purchase up to an additional 2,000,000 common shares. In connection with the entering of the Purchase Agreement, the parties agreed to terminate the prior Common Shares Purchase Agreement, dated May 30, 2018, between us and Aspire Capital.

The purchase price will be equal to the lesser of: (i) the lowest sale price of our common shares on NASDAQ on the purchase date, or (ii) the average of the three lowest closing sale prices of the common shares on NASDAQ during the 10 business days prior to the purchase date.

In addition to the regular purchases, we will also have the right to require Aspire Capital to purchase up to an additional 30% of the trading volume of the common shares for the next business day at a purchase price (the "VWAP Purchase Price") equal to the lesser of: (i) the closing sale price of the common shares on NASDAQ on the VWAP purchase date, or (ii) ninety-seven percent (97%) of the VWAP purchase date's volume weighted average price on NASDAQ (each such purchase, a "VWAP Purchase").

We will have the right, in our sole discretion, to determine a maximum number of common shares and set a minimum market price threshold for each VWAP Purchase and there will be no limits on the number of VWAP Purchases that we may require.

For any business day that the closing sale price of our common shares on NASDAQ is below US$0.25, the obligation of Aspire Capital to purchase common shares will be automatically suspended for that business day only.

Aspire Capital will not be allowed to own at one time more than 9.99% of our issued and outstanding common shares. The number of common shares that may be issued under the Purchase Agreement will be limited to 19.99% of our outstanding common shares as of the date of the Purchase Agreement, unless shareholder approval is obtained to issue more than such 19.99%. However, the 19.99% limitation will not apply if at the time that the 19.99% limitation is reached and at all times thereafter the average purchase price for all common shares issued under the Purchase Agreement is equal to or above a minimum price of US$2.10 (representing the average of the 5 closing prices on NASDAQ immediately preceding the signing of the Purchase Agreement).

No sales of common shares will be made in Canada under the Purchase Agreement and any sale of common shares by Aspire Capital is expected to be made to arm's length parties. There are no limitations on use of proceeds, financial covenants or restrictions on future financings and there are no rights of first refusal, participation rights, penalties or liquidated damages in the Purchase Agreement. We may terminate the Purchase Agreement at any time, at our discretion, without any additional cost or penalty.

As consideration for Aspire Capital's obligation under the Purchase Agreement, we have agreed to issue 171,428 common shares to Aspire Capital as a commitment fee (the "Commitment Shares").

Concurrently with entering into the Purchase Agreement, we also entered into a registration rights agreement with Aspire Capital (the "Registration Rights Agreement"), in which we agreed to file with the Securities and Exchange Commission (the "SEC") one or more registration statements, as necessary, and to the extent permissible and subject to certain exceptions, to register under the Securities Act of 1933, as amended, for the sale of the common shares that may be issued to Aspire Capital under the Purchase Agreement. We plan to file with the SEC a prospectus supplement to our effective shelf Registration Statement on Form S-3 (File 333-230218) registering all of the common shares that may be offered to Aspire Capital from time to time.

ITEM 6. – EXHIBITS

Exhibit Number	Description of Document
10.1	Form of Common Share Purchase Agreement dated May 7, 2019 by and between the Company and Aspire Capital Fund, LLC
10.2	Form of Registration Rights Agreement dated May 7, 2019 by and between the Company and Aspire Capital Fund, LLC
31.1	Certification Pursuant to Section 302 of the Sarbanes-Oxley Act Of 2002
31.2	Certification Pursuant to Section 302 of the Sarbanes-Oxley Act Of 2002
32.1	Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2	Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002

SIGNATURES

Pursuant to the requirements of the Securities Act, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of San Diego, State of California, on the 7th day of May, 2019.

Aptose Biosciences Inc.

By: /s/ William G. Rice
William G. Rice
Chairman, Chief Executive Officer and President

Exhibit 10.1

Execution Copy

COMMON SHARE PURCHASE AGREEMENT

COMMON SHARE PURCHASE AGREEMENT (the "**Agreement**"), dated as of May 7, 2019 by and between **APTOSE BIOSCIENCES INC.**, a corporation organized under the laws of Canada (the "**Company**"), and **ASPIRE CAPITAL FUND, LLC**, an Illinois limited liability company (the "**Buyer**"). Capitalized terms used herein and not otherwise defined herein are defined in Section 10 hereof.

WHEREAS:

Subject to the terms and conditions set forth in this Agreement, the Company wishes to sell to the Buyer, and the Buyer wishes to buy from the Company, up to Twenty Million Dollars ($20,000,000) of common shares of the Company without par value (the "**Common Shares**"). The Common Shares to be purchased hereunder are referred to herein as the "**Purchase Shares**."

NOW THEREFORE, the Company and the Buyer hereby agree as follows:

1. PURCHASE OF COMMON SHARES.

Subject to the terms and conditions set forth in this Agreement, the Company has the right to sell to the Buyer, and the Buyer has the obligation to purchase from the Company, Purchase Shares as follows:

(a) Commencement of Purchases of Common Shares. Any time after Commencement (as defined below), the purchase and sale of Purchase Shares hereunder shall occur from time to time upon written notices by the Company to the Buyer on the terms and conditions as set forth herein following the satisfaction of the conditions (the "**Commencement"**) as set forth in Sections 6 and 7 below (the date of satisfaction of such conditions, the "**Commencement Date**").

(b) The Company's Right to Require Regular Purchases. Subject to the terms and conditions of this Agreement, on any given Business Day after the Commencement Date, the Company shall have the right but not the obligation to direct the Buyer by its delivery to the Buyer of a Purchase Notice from time to time, and the Buyer thereupon shall have the obligation, to buy the number of Purchase Shares specified in such notice, up to 200,000 Purchase Shares, on such Business Day (as long as such notice is delivered on or before 5:00 p.m. Eastern time on such Business Day) (each such purchase, a "**Regular Purchase**") at the Purchase Price on the Purchase Date; however, in no event shall the Purchase Amount of a Regular Purchase exceed Five Hundred Thousand Dollars ($500,000) per Business Day, unless the Buyer and the Company mutually agree. The Company and the Buyer may mutually agree to increase the number of Purchase Shares that may be sold per Regular Purchase to as much as an additional 2,000,000 Purchase Shares per Business Day. The Company may deliver additional Purchase Notices to the Buyer from time to time The share amounts in this Section 1(b) shall be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction.

(c) VWAP Purchases. Subject to the terms and conditions of this Agreement, in addition to purchases of Purchase Shares as described in Section 1(b) above, with prior written notice (as long as such notice is delivered on or before 5:00 p.m. Eastern time on the Business Day immediately preceding the VWAP Purchase Date, the Company shall also have the right but not the obligation to direct the Buyer by the Company's delivery to the Buyer of a VWAP Purchase Notice from time to time, and the Buyer thereupon shall have the obligation, to buy the VWAP Purchase Share Percentage of the trading volume of the Common Shares on the VWAP Purchase Date up to the VWAP Purchase Share Volume Maximum on the VWAP Purchase Date (each such purchase, a "**VWAP Purchase**") at the VWAP Purchase Price. The Company may deliver a VWAP Purchase Notice to the Buyer on or before 5:00 p.m. Eastern time on a date on which the Company also submitted a Purchase Notice for a Regular Purchase of at least 200,000 Purchase Shares to the Buyer. The share amount in the prior sentence shall be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split, or other similar transaction. A VWAP Purchase shall automatically be deemed completed at such time on the VWAP Purchase Date that the Sale Price falls below the VWAP Minimum Price Threshold; in such circumstance, the VWAP Purchase Amount shall be calculated using (i) the VWAP Purchase Share Percentage of the aggregate shares traded on the U.S. Market for such portion of the VWAP Purchase Date prior to the time that the Sale Price fell below the VWAP Minimum Price Threshold and (ii) a VWAP Purchase Price calculated using the volume weighted average price of Common Shares sold during such portion of the VWAP Purchase Date prior to the time that the Sale Price fell below the VWAP Minimum Price Threshold. Upon completion of each VWAP Purchase Date, the Buyer shall submit to the Company a confirmation of the VWAP Purchase in form and substance reasonably acceptable to the Company. As soon as reasonably practicable after receiving payment from the Buyer for the Purchase Shares purchased under the VWAP Purchase, the Company shall deliver to the Company's Transfer Agent a direction to immediately issue to the Buyer the number of Purchase Shares that the Buyer has the obligation to buy pursuant to the VWAP Purchase Notice. The Company may deliver additional VWAP Purchase Notices to the Buyer from time to time so long as the most recent purchase has been completed.

(d) Payment for Purchase Shares. For each Regular Purchase, the Buyer shall pay to the Company an amount equal to the Purchase Amount as full payment for such Purchase Shares via wire transfer of immediately available funds on the same Business Day as the Regular Purchase and, as soon as reasonably practicable after receiving payment from the Buyer for the Purchase Shares purchased under such Regular Purchase, the Company shall deliver to the Company's Transfer Agent a direction to immediately issue to the Buyer the number of Purchase Shares that the Buyer has the obligation to buy pursuant to the Purchase Notice. For each VWAP Purchase, the Buyer shall pay to the Company an amount equal to the VWAP Purchase Amount as full payment for such Purchase Shares via wire transfer of immediately available funds on the second Business Day following the VWAP Purchase Date. All payments made under this Agreement shall be made in lawful money of the United States of America via wire transfer of immediately available funds to such account as the Company may from time to time designate by written notice in accordance with the provisions of this Agreement. Whenever any amount expressed to be due by the terms of this Agreement is due on any day that is not a Business Day, the same shall instead be due on the next succeeding day that is a Business Day.

(e) Purchase Price Floor. The Company and the Buyer shall not effect any sales under this Agreement on any Purchase Date where the Closing Sale Price is less than the Floor Price. "**Floor Price**" means $0.25 per Common Share, which shall be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction.

(f) Records of Purchases. The Buyer and the Company shall each maintain records showing the remaining Available Amount at any given time and the dates and Purchase Amounts for each purchase, or shall use such other method reasonably satisfactory to the Buyer and the Company to reconcile the remaining Available Amount.

(g) Taxes. The Company shall pay any and all transfer, stamp or similar taxes that may be payable with respect to the issuance and delivery of any Common Shares to the Buyer made under this Agreement.

(h) Compliance with Exchanges Rules. Notwithstanding anything in this Agreement to the contrary, and in addition to the limitations set forth in Sections 1(e) and 1(i), the total number of Common Shares that may be issued under this Agreement, including the Commitment Shares (as defined in Section 4(e) hereof), shall be limited to 8,748,525 Common Shares (the "**Exchange Cap**"), which equals 19.99% of the Company's outstanding Common Shares as of the date hereof, unless disinterested shareholder approval is obtained to issue more than such 19.99%. The Exchange Cap shall be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse-stock split or other similar transaction. The foregoing limitation shall not apply if shareholder approval has not been obtained and at any time the Exchange Cap is reached and at all times thereafter the average price paid for all shares issued under this Agreement is equal to or greater than $2.10 (the "**Minimum Price**"), a price equal to the lower of (a) the Closing Sale Price immediately preceding the execution of this Agreement or (b) the arithmetic average of the five (5) Closing Sale Prices for the Common Shares immediately preceding the execution of this Agreement (in such circumstance, for purposes of the Exchanges, the transaction contemplated hereby would not be "below market" and the Exchange Cap would not apply). The Minimum Price shall be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction. Notwithstanding anything to the contrary in this Agreement or otherwise, the Company shall not be required or permitted to issue, and the Buyer shall not be required to purchase, any Common Shares under this Agreement if such issuance would breach the Company's obligations under the rules or regulations of the Exchanges. The Company may, in its sole discretion, determine whether to obtain disinterested shareholder approval to issue more than 19.99% of its outstanding Common Shares hereunder.

(i) Beneficial Ownership Limitation. The Company shall not issue, and the Buyer shall not purchase any Common Shares under this Agreement, if such shares proposed to be issued and sold, when aggregated with all other Common Shares then owned beneficially (as calculated pursuant to Section 13(d) of the Securities Exchange Act of 1934, as amended (the "**1934 Act**") and Rule 13d-3 promulgated thereunder) by the Buyer and its affiliates would result in the beneficial ownership by the Buyer and its affiliates of more than 9.99% of the then issued and outstanding Common Shares, or if such shares proposed to be issued and sold would result in a change of control under the rules of the TSX.

(j) Material Non-Public Information Restriction. Notwithstanding anything in this Agreement to the contrary, during any period in which the Company is in possession of material non-public information, the Company and the Buyer agree that (i) no purchase of Purchase Shares will take place, (ii) the Company shall not request the purchase of any Purchase Shares, and (iii) the Buyer shall not be obligated to purchase any Purchase Shares.

(k) TSX Personal Information Form. The Company shall not issue and the Buyer shall not purchase any Common Shares under this Agreement if such shares proposed to be issued and sold, when aggregated with all other Common Shares then owned beneficially by the Buyer and its affiliates would result in the beneficial ownership by the Buyer and its affiliates of more than 9.99% of the then issued and outstanding Common Shares unless and until a personal information form is filed and precleared by the TSX in accordance with its rules. Accordingly, this Agreement may not result in the Buyer or any of its affiliates becoming an insider of the Company (as such term is defined under the rules of the TSX) unless and until a personal information form is filed and precleared by the TSX in accordance with its rules.

2. BUYER'S REPRESENTATIONS AND WARRANTIES.

The Buyer represents and warrants to the Company that as of the date hereof and as of the Commencement Date:

(a) Investment Purpose. The Buyer is entering into this Agreement and acquiring the Commitment Shares and the Purchase Shares (the Purchase Shares and the Commitment Shares are collectively referred to herein as the "**Securities**"), for its own account for investment only and not with a view towards, or for resale in connection with, the public sale or distribution thereof; provided however, by making the representations herein, the Buyer does not agree to hold any of the Securities for any minimum or other specific term. Notwithstanding anything to the contrary in this Agreement, the Company and the Buyer each acknowledge and agree that any resale or solicitation for resale of Purchase Shares by the Buyer pursuant to this Agreement shall be made solely in the United States and no resale of Purchase Shares will be carried out by the Buyer in Canada or on the TSX.

(b) Accredited Investor Status. The Buyer is an "accredited investor" as that term is defined in Rule 501(a)(3) of Regulation D under the 1933 Act.

(c) [Intentionally Omitted.]

(d) Information. The Buyer has been furnished with all materials relating to the business, finances and operations of the Company and materials relating to the offer and sale of the Securities that have been reasonably requested by the Buyer, including, without limitation, the SEC Documents (as defined in Section 3(f) hereof). The Buyer understands that its investment in the Securities involves a high degree of risk. The Buyer (i) is able to bear the economic risk of an investment in the Securities including a total loss, (ii) has such knowledge and experience in financial and business matters that it is capable of evaluating the merits and risks of the proposed investment in the Securities and (iii) has had an opportunity to ask questions of and receive answers from the officers of the Company concerning the financial condition and business of the Company, the terms and conditions of the offering of the Securities and other matters related to an investment in the Securities. Neither such inquiries nor any other due diligence investigations conducted by the Buyer or its representatives shall modify, amend or affect the Buyer's right to rely on the Company's representations and warranties contained in Section 3 below. The Buyer has sought such accounting, legal and tax advice as it has considered necessary to make an informed investment decision with respect to its acquisition of the Securities. The Buyer acknowledges that there may be material United States and Canadian tax consequences to it of the acquisition, holding and disposition of the Securities, it is the Buyer's sole responsibility to determine such tax consequences for the Buyer, and the Company has not made any representation or warranty to the Buyer with respect to such tax consequences.

(e) No Governmental Review. The Buyer understands that no United States federal or state agency or any other government or governmental agency has passed on or made any recommendation or endorsement of the Securities or the fairness or suitability of the investment in the Securities nor have such authorities passed upon or endorsed the merits of the offering of the Securities.

(f) [Intentionally Omitted.]

(g) Organization. The Buyer is a limited liability company duly organized and validly existing in good standing under the laws of the jurisdiction in which it is organized, and has the requisite organizational power and authority to own its properties and to carry on its business as now being conducted.

(h) Validity; Enforcement. This Agreement has been duly and validly authorized, executed and delivered on behalf of the Buyer and is a valid and binding agreement of the Buyer enforceable against the Buyer in accordance with its terms, subject as to enforceability to (i) general principles of equity and to applicable bankruptcy, insolvency, reorganization, moratorium, liquidation and other similar laws relating to, or affecting generally, the enforcement of applicable creditors' rights and remedies and (ii) public policy underlying any law, rule or regulation (including any federal or state securities law, rule or regulation) with regards to indemnification, contribution or exculpation. The execution and delivery of the Transaction Documents (as defined in Section 3(b) hereof) by the Buyer and the consummation by it of the transactions contemplated hereby and thereby do not conflict with the Buyer's certificate of organization or operating agreement or similar documents, and do not require further consent or authorization by the Buyer, its managers or its members.

(i) Residency. The Buyer is of the State of Illinois.

(j) No Prior Short Selling. The Buyer represents and warrants to the Company that at no time prior to the date of this Agreement has any of the Buyer, its agents, representatives or affiliates engaged in or effected, in any manner whatsoever, directly or indirectly, any (i) "short sale" (as such term is defined in Section 242.200 of Regulation SHO of the 1934 Act) of the Common Shares or (ii) hedging transaction, which establishes a net short position with respect to the Common Shares.

3. REPRESENTATIONS AND WARRANTIES OF THE COMPANY.

The Company represents and warrants to the Buyer that as of the date hereof and as of the Commencement Date:

(a) Organization and Qualification. The Company and its "Subsidiaries" (which for purposes of this Agreement means any entity in which the Company, directly or indirectly, owns more than 50% of the voting stock or capital stock or other similar equity interests) are corporations or limited liability companies duly organized and validly existing in good standing under the laws of the jurisdiction in which they are incorporated or organized, and have the requisite corporate or organizational power and authority to own their properties and to carry on their business as now being conducted. Each of the Company and its Subsidiaries is duly qualified as a foreign corporation or limited liability company to do business and is in good standing in every jurisdiction in which its ownership of property or the nature of the business conducted by it makes such qualification necessary, except to the extent that the failure to be so qualified or be in good standing would not reasonably be expected to have a Material Adverse Effect. As used in this Agreement, "Material Adverse Effect" means any material adverse effect on any of: (i) the business, properties, assets, operations, results of operations or financial condition of the Company and its Subsidiaries, if any, taken as a whole, or (ii) the authority or ability of the Company to perform its obligations under the Transaction Documents. The Company has no material Subsidiaries except as set forth on Schedule 3(a).

(b) Authorization; Enforcement; Validity. (i) The Company has the requisite corporate power and authority to enter into and perform its obligations under this Agreement, the Registration Rights Agreement and each of the other agreements entered into by the parties on the Commencement Date and attached hereto as exhibits to this Agreement (collectively, the "**Transaction Documents**"), and to issue the Securities in accordance with the terms hereof and thereof, (ii) the execution and delivery of the Transaction Documents by the Company and the consummation by it of the transactions contemplated hereby and thereby, including without limitation, the issuance of the Commitment Shares and the reservation for issuance and the issuance of the Purchase Shares issuable under this Agreement, have been duly authorized by the Company's Board of Directors or duly authorized committee thereof, do not conflict with the Company's Certificate of Incorporation or Bylaws (as defined below), and do not require further consent or authorization by the Company, its Board of Directors, except as set forth in this Agreement, or its shareholders, (iii) this Agreement has been, and each other Transaction Document shall be on the Commencement Date, duly executed and delivered by the Company and (iv) this Agreement constitutes, and each other Transaction Document upon its execution on behalf of the Company, shall constitute, the valid and binding obligations of the Company enforceable against the Company in accordance with their terms, except as such enforceability may be limited by (y) general principles of equity or applicable bankruptcy, insolvency, reorganization, moratorium, liquidation or similar laws relating to, or affecting generally, the enforcement of creditors' rights and remedies and (z) public policy underlying any law, rule or regulation (including any federal or state securities law, rule or regulation) with regards to indemnification, contribution or exculpation. The Board of Directors of the Company or duly authorized committee thereof has approved the resolutions (the "**Signing Resolutions**") substantially in the form as set forth as Exhibit B attached hereto to authorize this Agreement and the transactions contemplated hereby. The Signing Resolutions are valid, in full force and effect and have not been modified or supplemented in any material respect. The Company has delivered to the Buyer a true and correct copy of the Signing Resolutions as approved by the Board of Directors of the Company.

(c) Capitalization. As of the date hereof, the authorized capital of the Company consists of an unlimited number of Common Shares without par value, of which as of the date hereof, 43,764,509 shares are issued and outstanding, zero shares are held as treasury shares, 7,658,789 shares are reserved for future issuance pursuant to the Company's equity incentive plans, of which approximately 1,880,301 shares remain available for future option grants or stock awards. All of such outstanding shares have been, or upon issuance will be, validly issued and are fully paid and non-assessable. Except as disclosed in Schedule 3(c), (i) no shares of the Company's authorized capital are subject to preemptive rights or any other similar rights or any liens or encumbrances suffered or permitted by the Company, (ii) there are no outstanding debt securities of the Company or any of its Subsidiaries, (iii) there are no outstanding options, warrants, scrip, rights to subscribe to, calls or commitments of any character whatsoever relating to, or securities or rights convertible into, any common shares of the Company or any of its Subsidiaries, or contracts, commitments, understandings or arrangements by which the Company or any of its Subsidiaries is or may become bound to issue additional shares of the Company or any of its Subsidiaries or options, warrants, scrip, rights to subscribe to, calls or commitments of any character whatsoever relating to, or securities or rights convertible into, any shares of the Company or any of its Subsidiaries, (iv) there are no material agreements or arrangements under which the Company or any of its Subsidiaries is obligated to register the sale of any of their securities under the 1933 Act (except the Registration Rights Agreement), (v) there are no outstanding securities or instruments of the Company or any of its Subsidiaries which contain any redemption or similar provisions, and there are no contracts, commitments, understandings or arrangements by which the Company or any of its Subsidiaries is or may become bound to redeem a security of the Company or any of its Subsidiaries, (vi) there are no securities or instruments containing anti-dilution or similar provisions that will be triggered by the issuance of the Securities as described in this Agreement and (vii) the Company does not have any stock appreciation rights or "phantom stock" plans or agreements or any similar plan or agreement. The Company has furnished or made available to the Buyer true and correct copies of the Company's Certificate of Incorporation, as amended and as in effect on the date hereof (the "**Certificate of Incorporation**"), and the Company's Bylaws, as amended and as in effect on the date hereof (the "**Bylaws**").

(d) Issuance of Securities. The Commitment Shares have been duly authorized and, upon issuance in accordance with the terms hereof, the Commitment Shares shall be (i) validly issued, fully paid and non-assessable and (ii) free from all taxes, liens and charges with respect to the issuance thereof. Upon issuance and payment therefore in accordance with the terms and conditions of this Agreement, the Purchase Shares shall be validly issued, fully paid and non-assessable and free from all taxes, liens and charges with respect to the issue thereof, with the holders being entitled to all rights accorded to a holder of Common Shares.

(e) No Conflicts. Except as disclosed in Schedule 3(e), the execution, delivery and performance of the Transaction Documents by the Company and the consummation by the Company of the transactions contemplated hereby and thereby (including, without limitation, the reservation for issuance and issuance of the Purchase Shares) will not (i) result in a violation of the Certificate of Incorporation or the Bylaws or (ii)constitute a default (or an event which with notice or lapse of time or both would become a default) under, or give to others any rights of termination, amendment, acceleration or cancellation of, any agreement, indenture or instrument to which the Company or any of its Subsidiaries is a party, or result, to the Company's knowledge, in a violation of any law, rule, regulation, order, judgment or decree (including federal and state securities laws and regulations and the rules and regulations of the Exchanges applicable to the Company or any of its Subsidiaries) or by which any property or asset of the Company or any of its Subsidiaries is bound or affected, except in the case of defaults, terminations, amendments, accelerations, cancellations and violations under clause (ii), which would not reasonably be expected to result in a Material Adverse Effect. Except as disclosed in Schedule 3(e), neither the Company nor its Subsidiaries is in violation of any term of or in default under its Certificate of Incorporation or Bylaws or their organizational charter or bylaws, respectively. Except as disclosed in Schedule 3(e), neither the Company nor any of its Subsidiaries is in violation of any term of or is in default under any material contract, agreement, mortgage, indebtedness, indenture, instrument, judgment, decree or order or any statute, rule or regulation applicable to the Company or its Subsidiaries, except for possible violations, defaults, terminations or amendments that would not reasonably be expected to have a Material Adverse Effect. The business of the Company and its Subsidiaries is not being conducted, and shall not be conducted, in violation of any law, ordinance, or regulation of any governmental entity, except for possible violations, the sanctions for which either individually or in the aggregate would not reasonably be expected to have a Material Adverse Effect. Except as specifically contemplated by this Agreement, reporting obligations under the 1934 Act, or as required under the 1933 Act or applicable state securities laws or the filing of a Listing of Additional Shares Notification Form with the U.S. Exchange, the Company is not required to obtain any consent, authorization or order of, or make any filing or registration with, any court or governmental agency or any regulatory or self-regulatory agency in order for it to execute, deliver or perform any of its obligations under or contemplated by the Transaction Documents in accordance with the terms hereof or thereof. Except as disclosed in Schedule 3(e) and for reporting obligations under the 1934 Act, all consents, authorizations, orders, filings and registrations which the Company is required to obtain pursuant to the preceding sentence shall be obtained or effected on or prior to the Commencement Date. Except as disclosed in Schedule 3(e), the Company is not subject to any notices or actions from or to the Exchanges other than routine matters incident to listing on the Exchanges and not involving a violation of the rules of the Exchanges. Except as disclosed in Schedule 3(e), to the Company's knowledge, the U.S. Exchange has not commenced any delisting proceedings against the Company.

(f) SEC Documents; Financial Statements. Except as disclosed in Schedule 3(f), since December 31, 2017, the Company has filed all reports, schedules, forms, statements and other documents required to be filed by it with the SEC pursuant to the reporting requirements of the 1934 Act (all of the foregoing filed prior to the date hereof and all exhibits included therein and financial statements and schedules thereto and documents incorporated by reference therein being hereinafter referred to as the "**SEC Documents**"). As of their respective dates (except as they have been correctly amended), the SEC Documents complied in all material respects with the requirements of the 1934 Act and the rules and regulations of the SEC promulgated thereunder applicable to the SEC Documents, and none of the SEC Documents, at the time they were filed with the SEC (except as they may have been properly amended), contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading. As of their respective dates (except as they have been properly amended), the financial statements of the Company included in the SEC Documents complied as to form in all material respects with applicable accounting requirements and the published rules and regulations of the SEC with respect thereto. Such financial statements have been prepared in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board, consistently applied, during the periods involved (except (i) as may be otherwise indicated in such financial statements or the notes thereto or (ii) in the case of unaudited interim statements, to the extent they may exclude footnotes or may be condensed or summary statements) and fairly present in all material respects the financial position of the Company as of the dates thereof and the results of its operations and cash flows for the periods then ended (subject, in the case of unaudited statements, to normal year-end audit adjustments). Except as disclosed in Schedule 3(f) or routine correspondence, such as comment letters and notices of effectiveness in connection with previously filed registration statements or periodic reports publicly available on EDGAR, to the Company's knowledge, the Company or any of its Subsidiaries are not on the date hereof the subject of any inquiry, investigation or action by the SEC.

(g) Absence of Certain Changes. Except as disclosed in Schedule 3(g), since December 31, 2018, there has been no material adverse change in the business, properties, operations, financial condition or results of operations of the Company or its Subsidiaries taken as a whole. For purposes of this Agreement, neither a decrease in cash or cash equivalents or in the market price of the Common Shares nor losses incurred in the ordinary course of the Company's business shall be deemed or considered a material adverse change. The Company has not taken any steps, and does not currently expect to take any steps, to seek protection pursuant to any Bankruptcy Law nor does the Company or any of its Subsidiaries have any knowledge or reason to believe that its creditors intend to initiate involuntary bankruptcy or insolvency proceedings. The Company is financially solvent and is generally able to pay its debts as they become due**.**

(h) Absence of Litigation. Except as disclosed in Schedule 3(h), to the Company's knowledge, there is no action, suit, proceeding, inquiry or investigation before or by any court, public board, government agency, self-regulatory organization or body pending or, to the knowledge of the Company or any of its Subsidiaries, threatened against the Company, the Common Shares or any of the Company's Subsidiaries or any of the Company's or the Company's Subsidiaries' officers or directors in their capacities as such, which could reasonably be expected to have a Material Adverse Effect (each, an "**Action**"). A description of each such Action, if any, is set forth in Schedule 3(h).

(i) Acknowledgment Regarding Buyer's Status. The Company acknowledges and agrees that the Buyer is acting solely in the capacity of arm's length purchaser with respect to the Transaction Documents and the transactions contemplated hereby and thereby. The Company further acknowledges that the Buyer is not acting as a financial advisor or fiduciary of the Company (or in any similar capacity) with respect to the Transaction Documents and the transactions contemplated hereby and thereby and any advice given by the Buyer or any of its representatives or agents in connection with the Transaction Documents and the transactions contemplated hereby and thereby is merely incidental to the Buyer's purchase of the Securities. The Company further represents to the Buyer that the Company's decision to enter into the Transaction Documents has been based solely on the independent evaluation by the Company and its representatives and advisors.

(j) Intellectual Property Rights. To the Company's knowledge, the Company and its Subsidiaries own or possess adequate rights or licenses to use all material trademarks, trade names, service marks, service mark registrations, service names, patents, patent rights, copyrights, inventions, licenses, approvals, governmental authorizations, trade secrets and other intellectual property rights (collectively, "**Intellectual Property**") necessary to conduct their respective businesses as now conducted, except as set forth in Schedule 3(j) or to the extent that the failure to own, possess, license or otherwise hold adequate rights to use Intellectual Property would not, individually or in the aggregate, have a Material Adverse Effect. Except as disclosed in Schedule 3(j), to the Company's knowledge, none of the Company's active and registered Intellectual Property have expired or terminated, or, by the terms and conditions thereof, will expire or terminate within two years from the date of this Agreement, except as would not reasonably be expected to have a Material Adverse Effect. The Company and its Subsidiaries do not have any knowledge of any infringement by the Company or its Subsidiaries of any Intellectual Property of others and, except as set forth on Schedule 3(j), there is no claim, action or proceeding being made or brought against, or to the Company's knowledge, being threatened against, the Company or its Subsidiaries regarding Intellectual Property, which could reasonably be expected to have a Material Adverse Effect.

(k) Environmental Laws. To the Company's knowledge, the Company and its Subsidiaries (i) are in material compliance with any and all applicable foreign, federal, state, provincial and local laws and regulations relating to the protection of human health and safety or the environment with respect to hazardous or toxic substances or wastes, pollutants or contaminants ("**Environmental Laws**"), (ii) have received all material permits, licenses or other approvals required of them under applicable Environmental Laws to conduct their respective businesses and (iii) are in material compliance with all terms and conditions of any such permit, license or approval, except where, in each of the three foregoing clauses, the failure to so comply or receive such approvals would not reasonably be expected to have, individually or in the aggregate, a Material Adverse Effect.

(l) Title. The Company and its Subsidiaries have good and marketable title to all personal property owned by them that is material to the business of the Company and its Subsidiaries, in each case free and clear of all liens, encumbrances and defects except such as are described in Schedule 3(l) or such as do not materially affect the value of such property and do not interfere with the use made and proposed to be made of such property by the Company and any of its Subsidiaries or would not reasonably be expected to have, individually or in the aggregate, a Material Adverse Effect. Any real property and facilities held under lease by the Company and any of its Subsidiaries, to the Company's knowledge, are held by them under valid, subsisting and enforceable leases with such exceptions as are not material and do not interfere with the use made and proposed to be made of such property and buildings by the Company and its Subsidiaries.

(m) Insurance. The Company and each of its Subsidiaries are insured by insurers of recognized financial responsibility against such losses and risks and in such amounts as management of the Company believes to be reasonable and customary in the businesses in which the Company and its Subsidiaries are engaged. To the Company's knowledge, since December 31, 2016, neither the Company nor any such Subsidiary has been refused any insurance coverage sought or applied for and neither the Company nor any such Subsidiary, to the Company's knowledge, will be unable to renew its existing insurance coverage as and when such coverage expires or to obtain similar coverage from similar insurers as may be necessary to continue its business at a cost that would reasonably be expected to have a Material Adverse Effect.

(n) Regulatory Permits. The Company and its Subsidiaries possess all material certificates, authorizations and permits issued by the appropriate federal, state, provincial, local or foreign regulatory authorities necessary to conduct their respective businesses as currently conducted, except when the failure to so possess such certificates, authorizations or permits could not reasonably be expected to have, individually or in the aggregate, a Material Adverse Effect, and neither the Company nor any such Subsidiary has received any written notice of proceedings relating to the revocation or modification of any such material certificate, authorization or permit.

(o) Tax Status. The Company and each of its Subsidiaries has made or filed all federal, provincial and state income and all other material tax returns, reports and declarations required by any jurisdiction to which it is subject (unless and only to the extent that the Company and each of its Subsidiaries has set aside on its books reserves reasonably adequate for the payment of all unpaid and unreported taxes or filed valid extensions) and has paid all taxes and other governmental assessments and charges that are material in amount, shown or determined to be due on such returns, reports and declarations, except those being contested in good faith and has set aside on its books reserves reasonably adequate for the payment of all taxes for periods subsequent to the periods to which such returns, reports or declarations apply. To the Company's knowledge, there are no unpaid taxes in any material amount claimed to be due by the taxing authority of any jurisdiction.

(p) Transactions With Affiliates. Except as set forth on Schedule 3(p) and other than the grant or exercise of stock options or any other equity securities offered pursuant to duly adopted stock or incentive compensation plans as disclosed on Schedule 3(c), none of the officers, directors or employees of the Company is on the date hereof a party to any transaction with the Company or any of its Subsidiaries (other than for services as employees, officers and directors and reimbursement for expenses incurred on behalf of the Company), including any contract, agreement or other arrangement providing for the furnishing of services to or by, providing for rental of real or personal property to or from, or otherwise requiring payments to or from any officer, director or such employee or, to the knowledge of the Company, any corporation, partnership, trust or other entity in which any officer, director, or any such employee has a material interest or is an officer, director, trustee or general partner.

(q) Application of Takeover Protections. The Company and its board of directors have taken or will take prior to the Commencement Date all necessary action, if any, in order to render inapplicable any control share acquisition, business combination, poison pill (including any distribution under a rights agreement) or other similar anti-takeover provision under the Certificate of Incorporation or the laws of the jurisdiction of its incorporation which is or could become applicable to the Buyer as a result of the transactions contemplated by this Agreement, including, without limitation, the Company's issuance of the Securities and the Buyer's ownership of the Securities.

(r) Registration Statement. The Shelf Registration Statement (as defined in Section 4(a) hereof) has been declared effective by the SEC, and no stop order has been issued or is pending or, to the knowledge of the Company, threatened by the SEC with respect thereto. As of the date hereof, the Company has a dollar amount of securities registered and unsold under the Shelf Registration Statement, which is not less than the sum of (i) the Available Amount and (ii) the market value of the Commitment Shares on the date hereof.

4. COVENANTS.

(a) Filing of Form 8-K and Prospectus Supplement. The Company agrees that it shall, within the time required under the 1934 Act, file a Current Report on Form 8-K disclosing this Agreement and the transaction contemplated hereby. The Company shall file within two (2) Business Days from the Commencement Date a prospectus supplement to the Company's existing shelf registration statement on Form S-3 (File No. 333-230218, the "**Shelf Registration Statement**") covering the sale of the Commitment Shares and Purchase Shares (the "**Prospectus Supplement**") in accordance with the terms of the Registration Rights Agreement between the Company and the Buyer, dated as of the date hereof (the "**Registration Rights Agreement**"). its reasonable best efforts to effective under the 1933 Act and available for sales of all Securities to the Buyer no longer qualifies to make sales under the Shelf Registration Statement (which shall be understood to include the inability of the Company to immediately register sales of Securities to the Buyer under the Shelf Registration Statement or any New Registration Statement pursuant to General Instruction I.B.6 of Form S-3), (ii) the date on which all the Securities have been sold under this Agreement and no Available Amount remains thereunder, or (iii) Agreement has been terminated. The Shelf Registration Statement (including any amendments or supplements thereto and prospectuses or prospectus supplements, including the Prospectus Supplement, contained therein) shall not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein, or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading.

(b) Blue Sky. The Company shall take such action, if any, as is reasonably necessary in order to obtain an exemption for or to qualify (i) the initial sale of the Securities to the Buyer under this Agreement and (ii) any subsequent sale of the Securities by the Buyer, in each case, under applicable securities or "Blue Sky" laws of the states of the United States in such states as is reasonably requested by the Buyer from time to time, and shall provide evidence of any such action so taken to the Buyer at its written request; *provided, however*, that the Company shall not be obligated to file any general consent to service of process or to qualify as a foreign corporation or as a dealer in securities in any jurisdiction in which it is not so qualified or to subject itself to taxation in respect of doing business in any jurisdiction in which it is not otherwise so subject.

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

(d) Limitation on Short Sales and Hedging Transactions. The Buyer agrees that beginning on the date of this Agreement and ending on the date of termination of this Agreement as provided in Section 11(k), the Buyer and its agents, representatives and affiliates shall not in any manner whatsoever enter into or effect, directly or indirectly, any (i) "short sale" (as such term is defined in Section 242.200 of Regulation SHO of the 1934 Act) of the Common Shares or (ii) hedging transaction, which establishes a net short position with respect to the Common Shares.

(e) Issuance of Commitment Shares. In connection with the Commencement, the Company shall issue to the Buyer as consideration for the Buyer entering into this Agreement 171,428 Common Shares (the "**Commitment Shares**"). The Commitment Shares shall be issued without any restrictive legend whatsoever or prior sale requirement**.**

(f) Due Diligence. The Buyer shall have the right, from time to time as the Buyer may reasonably deem appropriate, to perform reasonable due diligence on the Company during normal business hours and subject to reasonable prior notice to the Company. The Company and its officers and employees shall provide information and reasonably cooperate with the Buyer in connection with any reasonable request by the Buyer related to the Buyer's due diligence of the Company, including, but not limited to, any such request made by the Buyer in connection with (i) the filing of the prospectus supplement described in Section 4(a) hereof and (ii) the Commencement; provided, however, that at no time is the Company required to disclose material nonpublic information to the Buyer or breach any obligation of confidentiality or non-disclosure to a third party or make any disclosure that could cause a waiver of attorney-client privilege. Except as may be required by law, court order or governmental authority, each party hereto agrees not to disclose any Confidential Information of the other party to any third party and shall not use the Confidential Information of such other party for any purpose other than in connection with, or in furtherance of, the transactions contemplated hereby. Each party hereto acknowledges that the Confidential Information shall remain the property of the disclosing party and agrees that it shall take all reasonable measures to protect the secrecy of any Confidential Information disclosed by the other party.

5. TRANSFER AGENT INSTRUCTIONS.

All of the Purchase Shares to be issued under this Agreement shall be issued without any restrictive legend unless the Buyer expressly consents otherwise. The Company shall issue irrevocable instructions to the Transfer Agent, and any subsequent transfer agent, to issue Common Shares in the name of the Buyer for the Purchase Shares (the "**Irrevocable Transfer Agent Instructions"**). The Company warrants to the Buyer that no instruction other than the Irrevocable Transfer Agent Instructions referred to in this Section 5, will be given by the Company to the Transfer Agent with respect to the Purchase Shares and that the Commitment Shares and the Purchase Shares shall otherwise be freely transferable on the books and records of the Company as and to the extent provided in this Agreement and the Registration Rights Agreement.

6. CONDITIONS TO THE COMPANY'S RIGHT TO COMMENCE SALES OF COMMON SHARES UNDER THIS AGREEMENT.

The right of the Company hereunder to commence sales of the Purchase Shares is subject to the satisfaction of each of the following conditions on or before the Commencement Date (the date that the Company may begin sales of Purchase Shares):

(a) The Buyer shall have executed each of the Transaction Documents and delivered the same to the Company;

(b) The representations and warranties of the Buyer shall be true and correct as of the Commencement Date as though made at that time (except for representations and warranties that speak as of a specific date, which shall be true and correct in all material respects as of such specific date) and the Buyer shall have performed, satisfied and complied in all material respects with the covenants and agreements required by this Agreement to be performed, satisfied or complied with by the Buyer at or prior to the Commencement Date; and

(c) The Prospectus Supplement shall have been delivered to the Buyer and no stop order with respect to the registration statement covering the sale of shares to the Buyer shall be pending or, to the knowledge of the Company, threatened by the SEC.

7. CONDITIONS TO THE BUYER'S OBLIGATION TO MAKE PURCHASES OF SHARES OF COMMON SHARES.

The obligation of the Buyer to buy Purchase Shares under this Agreement is subject to the satisfaction of each of the following conditions on or before the Commencement Date (the date that the Company may begin sales of Purchase Shares) and once such conditions have been initially satisfied, there shall not be any ongoing obligation to satisfy such conditions after the Commencement has occurred:

(a) The Company shall have executed each of the Transaction Documents and delivered the same to the Buyer;

(b) The Company shall have received all approvals and authorizations as necessary and applicable by the TSX and the U.S. Exchange to issue the shares hereunder;

(c) The Common Shares shall be authorized for quotation on the U.S. Exchange, trading in the Common Shares shall not have been within the last 365 days suspended by the SEC or the U.S. Exchange, other than a general halt in trading in the Common Shares by the U.S. Exchange under halt codes indicating pending or released material news, and the Securities shall be approved for listing upon the U.S. Exchange;

(d) The Buyer shall have received opinions of the Company's Canadian and United States legal counsel, each dated as of the Commencement Date and in customary form and substance;

(e) The representations and warranties of the Company shall be true and correct in all material respects (except to the extent that any of such representations and warranties is already qualified as to materiality in Section 3 above, in which case, such representations and warranties shall be true and correct without further qualification) as of the date of this Agreement and as of the Commencement Date as though made at that time (except for representations and warranties that speak as of a specific date, which shall be true and correct in all material respects as of such specific date) and the Company shall have performed, satisfied and complied in all material respects with the covenants, agreements and conditions required by the Transaction Documents to be performed, satisfied or complied with by the Company at or prior to the Commencement Date. The Buyer shall have received a certificate, executed by the CEO, President or CFO of the Company, dated as of the Commencement Date, to the foregoing effect in the form attached hereto as **Exhibit A**;

(f) The Board of Directors of the Company or a duly authorized committee thereof shall have adopted resolutions substantially in the form attached hereto as **Exhibit B** which shall be in full force and effect without any amendment or supplement thereto as of the Commencement Date;

(g) As of the Commencement Date, the Company shall have reserved out of its authorized and unissued Common shares the Purchase Shares solely for the purpose of effecting future purchases of Purchase Shares hereunder;

(h) The Irrevocable Transfer Agent Instructions, in form acceptable to the Buyer shall have been delivered to and acknowledged in writing by the Company and the Buyer and have been delivered to the Transfer Agent;

(i) The Company shall have delivered to the Buyer a certificate evidencing the incorporation and good standing of the Company under the laws of Canada issued by Industry Canada as of a date within ten (10) Business Days of the Commencement Date;

(j) [Intentionally Omitted.];

(k) The Company shall have delivered to the Buyer a secretary's certificate executed by the Secretary of the Company, dated as of the Commencement Date, in the form attached hereto as **Exhibit C**;

(l) The Shelf Registration Statement shall have been declared effective under the 1933 Act by the SEC and no stop order with respect thereto shall be pending or, to the knowledge of the Company, threatened by the SEC. The Company shall have prepared and delivered to the Buyer a final and complete form of Prospectus Supplement, dated and current as of the Commencement Date, to be used in connection with any issuances of any Commitment Shares or any Purchase Shares to the Buyer, and to be filed by the Company within two (2) Business Days after the Commencement Date pursuant to Rule 424(b) under the 1933 Act. The Company shall have made all filings under all applicable federal and state securities laws necessary to consummate the issuance of the Commitment Shares and the Purchase Shares pursuant to this Agreement in compliance with such laws;

(m) No Event of Default has occurred and is continuing, or any event which, after notice and/or lapse of time, would become an Event of Default has occurred;

(n) On or prior to the Commencement Date, the Company shall take all necessary action, if any, and such actions as reasonably requested by the Buyer, in order to render inapplicable any control share acquisition, business combination, stockholder rights plan or poison pill (including any distribution under a rights agreement) or other similar anti-takeover provision under the Certificate of Incorporation or the laws of the jurisdiction of its incorporation that is or could become applicable to the Buyer as a result of the transactions contemplated by this Agreement, including, without limitation, the Company's issuance of the Securities and the Buyer's ownership of the Securities; and

(o) The Company shall have provided the Buyer with the information reasonably requested by the Buyer in connection with its due diligence requests made prior to, or in connection with, the Commencement, in accordance with the terms of Section 4(f) hereof.

8. INDEMNIFICATION.

In consideration of the Buyer's execution and delivery of the Transaction Documents and acquiring the Securities hereunder and in addition to all of the Company's other obligations under the Transaction Documents, the Company shall defend, protect, indemnify and hold harmless the Buyer and all of its affiliates, members, officers, directors, and employees, and any of the foregoing person's agents or other representatives (including, without limitation, those retained in connection with the transactions contemplated by this Agreement) (collectively, the "**Indemnitees**") from and against any and all third party actions, causes of action, suits, claims, losses, costs, penalties, fees, liabilities and damages, and expenses in connection therewith (irrespective of whether any such Indemnitee is a party to the action for which indemnification hereunder is sought), and including reasonable attorneys' fees and disbursements (the "**Indemnified Liabilities**"), incurred by any Indemnitee as a result of, or arising out of, or relating to (a) any misrepresentation or breach of any representation or warranty made by the Company in the Transaction Documents or any other certificate, instrument or document contemplated hereby or thereby, (b) any breach of any covenant, agreement or obligation of the Company contained in the Transaction Documents or any other certificate, instrument or document contemplated hereby or thereby, or (c) any cause of action, suit or claim brought or made against such Indemnitee and arising out of or resulting from the execution, delivery, performance or enforcement of the Transaction Documents or any other certificate, instrument or document contemplated hereby or thereby, other than with respect to Indemnified Liabilities which directly and primarily result from (A) a breach of any of the Buyer's representations and warranties, covenants or agreements contained in this Agreement, or (B) the gross negligence, bad faith or willful misconduct of the Buyer or any other Indemnitee. To the extent that the foregoing undertaking by the Company may be unenforceable for any reason, the Company shall make the maximum contribution to the payment and satisfaction of each of the Indemnified Liabilities which is permissible under applicable law.

9. EVENTS OF DEFAULT.

An "**Event of Default**" shall be deemed to have occurred at any time as any of the following events occurs:

(a) during any period in which the effectiveness of any registration statement is required to be maintained pursuant to the terms of the Registration Rights Agreement, the effectiveness of such registration statement lapses for any reason (including, without limitation, the issuance of a stop order) or is unavailable to the Company for sale of all of the Registrable Securities (as defined in the Registration Rights Agreement) to the Buyer in accordance with the terms of the Registration Rights Agreement, and such lapse or unavailability continues for a period of ten (10) consecutive Business Days or for more than an aggregate of sixty (60) Business Days in any 365-day period, which is not in connection with a post-effective amendment to any such registration statement or the filing of a new registration statement; provided, however, that in connection with any post-effective amendment to such registration statement or filing of a new registration statement that is required to be declared effective by the SEC, such lapse or unavailability may continue for a period of no more than sixty (60) consecutive Business Days, which such period shall be extended for an additional thirty (30) Business Days if the Company receives a comment letter from the SEC in connection therewith;

(b) the suspension from trading or failure of the Common Shares to be listed on the U.S. Exchange for a period of three (3) consecutive Business Days;

(c) the delisting of the Common Shares from the Nasdaq Capital Market, if the Common Shares are not immediately thereafter trading on the New York Stock Exchange, the NYSE American, the Nasdaq Global Select Market, or the Nasdaq Global Market;

(d) the failure for any reason by the Transfer Agent to issue Purchase Shares to the Buyer within five (5) Business Days after the applicable payment has been made by the Buyer to the Company;

(e) the Company's breach of any representation or warranty (as of the dates made), covenant or other term or condition under any Transaction Document if such breach would reasonably be expected to have a Material Adverse Effect and except, in the case of a breach of a covenant which is reasonably curable, only if such breach continues uncured for a period of at least five (5) Business Days;

(f) if any Person commences a proceeding against the Company pursuant to or within the meaning of any Bankruptcy Law;

(g) if the Company pursuant to or within the meaning of any Bankruptcy Law; (A) commences a voluntary case, (B) consents to the entry of an order for relief against it in an involuntary case, (C) consents to the appointment of a Custodian of it or for all or substantially all of its property, (D) makes a general assignment for the benefit of its creditors or (E) becomes insolvent;

(h) a court of competent jurisdiction enters an order or decree under any Bankruptcy Law that (A) is for relief against the Company in an involuntary case, (B) appoints a Custodian of the Company or for all or substantially all of its property, or (C) orders the liquidation of the Company or any Subsidiary; or

(i) if at any time after the Commencement Date, the Exchange Cap is reached unless and until shareholder approval is obtained pursuant to Section 1(h) hereof. The Exchange Cap shall be deemed to be reached at such time if, upon submission of a Purchase Notice or VWAP Purchase Notice under this Agreement, the issuance of such number of Common Shares would exceed the number of Common Shares which the Company may issue under this Agreement without breaching the Company's obligations under the rules or regulations of the Exchanges.

In addition to any other rights and remedies under applicable law and this Agreement, including the Buyer termination rights under Section 11(k) hereof, so long as an Event of Default has occurred and is continuing, or if any event which, after notice and/or lapse of time, would become an Event of Default, has occurred and is continuing, or so long as the Closing Sale Price is below the Floor Price, the Company may not require and the Buyer shall not be obligated to purchase any Common Shares under this Agreement. If pursuant to or within the meaning of any Bankruptcy Law, the Company commences a voluntary case or any Person commences a proceeding against the Company, a Custodian is appointed for the Company or for all or substantially all of its property, or the Company makes a general assignment for the benefit of its creditors, (any of which would be an Event of Default as described in Sections 9(f), 9(g) and 9(h) hereof) this Agreement shall automatically terminate without any liability or payment to the Company without further action or notice by any Person. No such termination of this Agreement under Section 11(k)(i) shall affect the Company's or the Buyer's obligations under this Agreement with respect to pending purchases and the Company and the Buyer shall complete their respective obligations with respect to any pending purchases under this Agreement.

10. CERTAIN DEFINED TERMS.

For purposes of this Agreement, the following terms shall have the following meanings:

(a) "**1933 Act**" means the Securities Act of 1933, as amended.

(b) "**Available Amount**" means initially Twenty Million Dollars ($20,000,000) in the aggregate which amount shall be reduced by the Purchase Amount each time the Buyer purchases Common Shares pursuant to Section 1 hereof.

(c) "**Bankruptcy Law**" means Title 11, U.S. Code, or any similar Canadian, U.S. federal or state or foreign law for the relief of debtors.

(d) "**Business Day**" means any day on which the U.S. Exchange is open for trading during normal trading hours (i.e., 9:30 a.m. to 4:00 p.m. Eastern Time), including any day on which the U.S. Exchange is open for trading for a period of time less than the customary time.

(e) "**Closing Sale Price**" means the last closing trade price for the Common Shares on the U.S. Exchange as reported by the U.S. Exchange.

(f) "**Confidential Information**" means any information disclosed by either party to the other party, either directly or indirectly, in writing, orally or by inspection of tangible objects (including, without limitation, documents, prototypes, samples, plant and equipment), which is designated as "Confidential," "Proprietary" or some similar designation. Information communicated orally shall be considered Confidential Information if such information is expressly identified as Confidential Information at the time of such initial disclosure and confirmed in writing as being Confidential Information within ten (10) Business Days after the initial disclosure. Confidential Information may also include information disclosed to a disclosing party by third parties. Confidential Information shall not, however, include any information which (i) was publicly known and made generally available in the public domain prior to the time of disclosure by the disclosing party; (ii) becomes publicly known and made generally available after disclosure by the disclosing party to the receiving party through no action or inaction of the receiving party; (iii) is already in the possession of the receiving party at the time of disclosure by the disclosing party as shown by the receiving party's files and records immediately prior to the time of disclosure; (iv) is obtained by the receiving party from a third party without a breach of such third party's obligations of confidentiality; (v) is independently developed by the receiving party without use of or reference to the disclosing party's Confidential Information, as shown by documents and other competent evidence in the receiving party's possession; or (vi) is required by law to be disclosed by the receiving party, provided that the receiving party gives the disclosing party prompt written notice of such requirement prior to such disclosure and assistance in obtaining an order protecting the information from public disclosure.

(g) "**Custodian**" means any receiver, trustee, assignee, liquidator or similar official under any Bankruptcy Law.

(h) "**Exchanges**" means the U.S. Exchange and the TSX;

(i) "**Maturity Date**" means the date that is thirty (30) months from the Commencement Date.

(j) "**Person**" means an individual or entity including any limited liability company, a partnership, a joint venture, a corporation, a trust, an unincorporated organization and a government or any department or agency thereof.

(k) "**Purchase Amount**" means, with respect to any particular purchase made hereunder, the portion of the Available Amount to be purchased by the Buyer pursuant to Section 1 hereof as set forth in a valid Purchase Notice or VWAP Purchase Notice which the Company delivers to the Buyer.

(l) "**Purchase Date**" means, with respect to any Regular Purchase made hereunder, the Business Day of receipt by the Buyer of a valid Purchase Notice that the Buyer is to buy Purchase Shares pursuant to Section 1(b) hereof.

(m) "**Purchase Notice**" shall mean an irrevocable written notice from the Company to the Buyer directing the Buyer to buy Purchase Shares pursuant to Section 1(b) hereof as specified by the Company therein at the applicable Purchase Price on the Purchase Date.

(n) "**Purchase Price**" means the lesser of (i) the lowest Sale Price of the Common Shares on the Purchase Date or (ii) the arithmetic average of the three (3) lowest Closing Sale Prices for the Common Shares during the ten (10) consecutive Business Days ending on the Business Day immediately preceding such Purchase Date (to be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction).

(o) "**Sale Price**" means any trade price for the Common Shares on the U.S. Exchange during normal trading hours, as reported by the U.S. Exchange.

(p) "**SEC**" means the United States Securities and Exchange Commission.

(q) "**Transfer Agent**" means the transfer agent of the Company as set forth in Section 11(f) hereof or such other person who is then serving as the transfer agent for the Company in respect of the Common Shares.

(r) "**TSX**" means the Toronto Stock Exchange.

(s) "**U.S. Exchange**" means the NASDAQ Capital Market; provided however, that in the event the Company's Common Shares are ever listed or traded on the New York Stock Exchange, the NYSE MKT, the Nasdaq Global Select Market, the Nasdaq Global Market, the OTC Bulletin Board or either of the OTCQB marketplace or the OTCQX marketplace of the OTC Markets Group, then the "U.S. Exchange" shall mean such other market or exchange on which the Company's Common Shares are then listed or traded.

(t) "**VWAP Minimum Price Threshold**" means, with respect to any particular VWAP Purchase Notice, the Sale Price on the VWAP Purchase Date equal to the greater of (i) 80% of the Closing Sale Price on the Business Day immediately preceding the VWAP Purchase Date or (ii) such higher price as set forth by the Company in the VWAP Purchase Notice.

(u) "**VWAP Purchase Amount**" means, with respect to any particular VWAP Purchase Notice, the portion of the Available Amount to be purchased by the Buyer pursuant to Section 1(c) hereof pursuant to a valid VWAP Purchase Notice which requires the Buyer to buy the VWAP Purchase Share Percentage of the aggregate shares traded on the U.S. Exchange during normal trading hours on the VWAP Purchase Date up to the VWAP Purchase Share Volume Maximum, subject to the VWAP Minimum Price Threshold.

(v) "**VWAP Purchase Date**" means, with respect to any VWAP Purchase made hereunder, the Business Day following the receipt by the Buyer of a valid VWAP Purchase Notice that the Buyer is to buy Purchase Shares pursuant to Section 1(c) hereof.

(w) "**VWAP Purchase Notice**" shall mean an irrevocable written notice from the Company to the Buyer directing the Buyer to buy Purchase Shares on the VWAP Purchase Date pursuant to Section 1(c) hereof as specified by the Company therein at the applicable VWAP Purchase Price with the applicable VWAP Purchase Share Percentage specified therein.

(x) "**VWAP Purchase Share Percentage**" means, with respect to any particular VWAP Purchase Notice pursuant to Section 1(c) hereof, the percentage set forth in the VWAP Purchase Notice which the Buyer will be required to buy as a specified percentage of the aggregate shares traded on the U.S. Exchange during normal trading hours up to the VWAP Purchase Share Volume Maximum on the VWAP Purchase Date subject to Section 1(c) hereof but in no event shall this percentage exceed thirty percent (30%) of such VWAP Purchase Date's share trading volume of the Common Shares on the U.S. Exchange during normal trading hours.

(y) "**VWAP Purchase Price**" means the lesser of (i) the Closing Sale Price on the VWAP Purchase Date; or (ii) ninety-seven percent (97%) of volume weighted average price for the Common Shares traded on the U.S. Exchange during normal trading hours on (A) the VWAP Purchase Date if the aggregate shares traded on the U.S. Exchange on the VWAP Purchase Date have not exceeded the VWAP Purchase Share Volume Maximum and the Sale Price of Common Shares has not fallen below the VWAP Minimum Price Threshold (to be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction), or (B) the portion of the VWAP Purchase Date until such time as the sooner to occur of (1) the time at which the aggregate shares traded on the U.S. Exchange has exceeded the VWAP Purchase Share Volume Maximum, or (2) the time at which the Sale Price of Common Shares falls below the VWAP Minimum Price Threshold (to be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction).

(z) "**VWAP Purchase Share Estimate**" means the number of shares of Common Shares that the Company has in its sole discretion estimated in connection with a VWAP Purchase Notice pursuant to Section 1(c) hereof (to be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction).

(aa) "**VWAP Purchase Share Volume Maximum**" means a number of shares of Common Shares traded on the U.S. Exchange during normal trading hours on the VWAP Purchase Date equal to: (i) the VWAP Purchase Share Estimate, divided by (ii) the VWAP Purchase Share Percentage (to be appropriately adjusted for any reorganization, recapitalization, non-cash dividend, stock split, reverse stock split or other similar transaction).

11. MISCELLANEOUS.

(a) Governing Law; Jurisdiction; Jury Trial. The laws of the Province of Ontario shall governall issues concerning the relative rights of the Company and its shareholders. All other questions concerning the construction, validity, enforcement and interpretation of this Agreement and the other Transaction Documents shall be governed by the internal laws of the State of Illinois, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of Illinois or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of Illinois. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of Chicago, for the adjudication of any dispute hereunder or under the other Transaction Documents or in connection herewith or therewith, or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof to such party at the address for such notices to it under this Agreement and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. **EACH PARTY HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION HEREWITH OR ARISING OUT OF THIS AGREEMENT OR ANY TRANSACTION CONTEMPLATED HEREBY.**

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

(c) Headings. The headings of this Agreement are for convenience of reference and shall not form part of, or affect the interpretation of, this Agreement.

(d) Severability. If any provision of this Agreement shall be invalid or unenforceable in any jurisdiction, such invalidity or unenforceability shall not affect the validity or enforceability of the remainder of this Agreement in that jurisdiction or the validity or enforceability of any provision of this Agreement in any other jurisdiction.

(e) Entire Agreement. This Agreement and the Registration Rights Agreement supersede all other prior oral or written agreements between the Buyer, the Company, their affiliates and persons acting on their behalf with respect to the matters discussed herein, and this Agreement, the other Transaction Documents and the instruments referenced herein contain the entire understanding of the parties with respect to the matters covered herein and therein and, except as specifically set forth herein or therein, neither the Company nor the Buyer makes any representation, warranty, covenant or undertaking with respect to such matters. Each of the Company and the Buyer acknowledges and agrees that it has not relied on, in any manner whatsoever, any representations or statements, written or oral, other than as expressly set forth in this Agreement. The Buyer and the Company agree the Common Share Purchase Agreement, dated as of May 30, 2018, by and between the Company and the Buyer, is hereby terminated in accordance with its terms.

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

If to the Company:

Aptose Biosciences Inc.
251 Consumers Road, Suite 1105
Toronto, Ontario M2J 4R3
Telephone: 650-718-5028
Facsimile: 905-234-2120
Attention: Gregory K. Chow, CFO
Email: gchow@aptose.com

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

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

If to the Buyer:

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

With a copy to (which shall not constitute delivery to the Buyer):

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

If to the Transfer Agent:

Computershare Investor Services Inc.
100 University Avenue, 8th Floor
Toronto, ON M5J 2Y1
Telephone: 416-263-9534
Facsimile: 888-453-0330
Attention: Paul Allen
Email: paul.allen@computershare.com

or at such other address and/or facsimile number and/or to the attention of such other person as the recipient party has specified by written notice given to each other party at least one (1) Business Day prior to the effectiveness of such change. Written confirmation of receipt (A) given by the recipient of such notice, consent or other communication, (B) mechanically or electronically generated by the sender's facsimile machine containing the time, date, and recipient facsimile number, (C) electronically generated by the sender's electronic mail containing the time, date and recipient email address or (D) provided by a nationally recognized overnight delivery service, shall be rebuttable evidence of receipt in accordance with clause (i), (ii), (iii) or (iv) above, respectively.

(g) Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of the parties and their respective successors and assigns. The Company shall not assign this Agreement or any rights or obligations hereunder without the prior written consent of the Buyer, including by merger or consolidation; provided, however, that any transaction, whether by merger, reorganization, restructuring, consolidation, financing or otherwise, whereby the Company remains the surviving entity immediately after such transaction shall not be deemed a succession or assignment. The Buyer may not assign its rights or obligations under this Agreement.

(h) No Third Party Beneficiaries. This Agreement is intended for the benefit of the parties hereto and their respective permitted successors and assigns, and is not for the benefit of, nor may any provision hereof be enforced by, any other person.

(i) Publicity. The Buyer shall have the right to approve before issuance any press release, SEC filing or any other public disclosure made by or on behalf of the Company whatsoever with respect to, in any manner, the Buyer, its purchases hereunder or any aspect of this Agreement or the transactions contemplated hereby; provided, however, that the Company shall be entitled, without the prior approval of the Buyer, to make any press release or other public disclosure (including any filings with the SEC or with Canadian securities regulatory authorities) with respect to such transactions as is required by applicable law and regulations so long as the Company and its counsel consult with the Buyer in connection with any such press release or other public disclosure at least one (1) Business Day prior to its release; provided, however, that the Company's obligations pursuant to this Section 11 (i) shall not apply if the material provisions of such press release, SEC filing, or other public disclosure previously has been publicly disclosed by the Company in accordance with this Section 11(i). The Buyer must be provided with a copy thereof at least one (1) Business Day prior to any release or use by the Company thereof.

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

(k) Termination. This Agreement may be terminated only as follows:

(i) By the Buyer any time an Event of Default exists without any liability or payment to the Company. However, if pursuant to or within the meaning of any Bankruptcy Law, the Company commences a voluntary case or any Person commences a proceeding against the Company, a Custodian is appointed for the Company or for all or substantially all of its property, or the Company makes a general assignment for the benefit of its creditors, (any of which would be an Event of Default as described in Sections 9(f), 9(g) and 9(h) hereof) this Agreement shall automatically terminate without any liability or payment to the Company without further action or notice by any Person. No such termination of this Agreement under this Section 11(k)(i) shall affect the Company's or the Buyer's obligations under this Agreement with respect to pending purchases and the Company and the Buyer shall complete their respective obligations with respect to any pending purchases under this Agreement.

(ii) In the event that the Commencement shall not have occurred the Company shall have the option to terminate this Agreement for any reason or for no reason without any liability whatsoever of either party to the other party under this Agreement.

(iii) In the event that the Commencement shall not have occurred within ten (10) Business Days of the date of this Agreement, due to the failure to satisfy any of the conditions set forth in Sections 6 and 7 above with respect to the Commencement, either party shall have the option to terminate this Agreement at the close of business on such date or thereafter without liability of either party to any other party; provided, however, that the right to terminate this Agreement under this Section 11(k)(iii) shall not be available to either party if such failure to satisfy any of the conditions set forth in Sections 6 and 7 is the result of a breach of this Agreement by such party or the failure of any representation or warranty of such party included in this Agreement to be true and correct in all material respects.

(iv) At any time after the Commencement Date, the Company shall have the option to terminate this Agreement for any reason or for no reason by delivering notice (a "**Company Termination Notice**") to the Buyer electing to terminate this Agreement without any liability whatsoever of either party to the other party under this Agreement. The Company Termination Notice shall not be effective until one (1) Business Day after it has been received by the Buyer.

(v) This Agreement shall automatically terminate on the date that the Company sells and the Buyer purchases the full Available Amount as provided herein, without any action or notice on the part of any party and without any liability whatsoever of any party to any other party under this Agreement.

(vi) If by the Maturity Date for any reason or for no reason the full Available Amount under this Agreement has not been purchased as provided for in Section 1 of this Agreement, this Agreement shall automatically terminate on the Maturity Date, without any action or notice on the part of any party and without any liability whatsoever of any party to any other party under this Agreement.

Except as set forth in Sections 11(k)(i) (in respect of an Event of Default under Sections 9(f), 9(g) and 9(h)), 11(k)(v) and 11(k)(vi), any termination of this Agreement pursuant to this Section 11(k) shall be effected by written notice from the Company to the Buyer, or the Buyer to the Company, as the case may be, setting forth the basis for the termination hereof. The representations and warranties of the Company and the Buyer contained in Sections 2, 3 and 5 hereof, the indemnification provisions set forth in Section 8 hereof and the agreements and covenants set forth in Sections 4(e) and 11, shall survive the Commencement and any termination of this Agreement. No termination of this Agreement shall affect the Company's or the Buyer's rights or obligations (i) under the Registration Rights Agreement which shall survive any such termination in accordance with its terms or (ii) under this Agreement with respect to pending purchases and the Company and the Buyer shall complete their respective obligations with respect to any pending purchases under this Agreement.

(l) No Financial Advisor, Placement Agent, Broker or Finder. The Company represents and warrants to the Buyer that it has not engaged any financial advisor, placement agent, broker or finder in connection with the transactions contemplated hereby. The Buyer represents and warrants to the Company that it has not engaged any financial advisor, placement agent, broker or finder in connection with the transactions contemplated hereby. Each party shall be responsible for the payment of any fees or commissions, if any, of any financial advisor, placement agent, broker or finder engaged by such party relating to or arising out of the transactions contemplated hereby. Each party shall pay, and hold the other party harmless against, any liability, loss or expense (including, without limitation, attorneys' fees and out of pocket expenses) arising in connection with any such claim.

(m) No Strict Construction. The language used in this Agreement will be deemed to be the language chosen by the parties to express their mutual intent, and no rules of strict construction will be applied against any party.

(n) Failure or Indulgence Not Waiver. No failure or delay in the exercise of any power, right or privilege hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any such power, right or privilege preclude other or further exercise thereof or of any other right, power or privilege.

* * * * *

IN WITNESS WHEREOF, the Buyer and the Company have caused this Common Share Purchase Agreement to be duly executed as of the date first written above.

THE COMPANY:

APTOSE BIOSCIENCES INC.

By:_____
Name: Gregory K. Chow
Title: Chief Financial Officer

BUYER:

ASPIRE CAPITAL FUND, LLC
BY: ASPIRE CAPITAL PARTNERS, LLC
BY: SGM HOLDINGS CORP.

By:_____
Name: Steven G. Martin
Title: President

SCHEDULES

Schedule 3(a)	Subsidiaries
Schedule 3(c)	Capitalization
Schedule 3(e)	Conflicts
Schedule 3(f)	1934 Act Filings
Schedule 3(g)	Material Changes
Schedule 3(h)	Litigation
Schedule 3(j)	Intellectual Property
Schedule 3(l)	Title
Schedule 3(p)	Transactions with Affiliates

EXHIBITS

Exhibit A	Form of Officer's Certificate
Exhibit B	Form of Resolutions of Board of Directors of the Company
Exhibit C	Form of Secretary's Certificate

DISCLOSURE SCHEDULES

Schedule 3(a) – Subsidiaries

None.

Schedule 3(c) – Capitalization

None.

Schedule 3(e) – Conflicts

None.

Schedule 3(f) – 1934 Act Filings

None.

Schedule 3(g) – Material Changes

None.

Schedule 3(h) – Litigation

None.

Schedule 3(j) – Intellectual Property

None.

Schedule 3(l) – Title

None.

Schedule 3(p) – Transactions with Affiliates

None.

EXHIBIT A

FORM OF OFFICER'S CERTIFICATE

This Officer's Certificate ("**Certificate**") is being delivered pursuant to Section 7(e) of that certain Common Share Purchase Agreement dated as of May 7, 2019 (the "**Common Share Purchase Agreement**"), by and between **APTOSE BIOSCIENCES INC.**, a corporation organized under the laws of Canada (the "**Company**"), and **ASPIRE CAPITAL FUND, LLC**, an Illinois limited liability company (the "**Buyer**"). Terms used herein and not otherwise defined shall have the meanings ascribed to them in the Common Share Purchase Agreement.

The undersigned, _____, _____ of the Company, hereby certifies as follows:

1. I am the _____ of the Company and make the statements contained in this Certificate in my capacity as such;

2. The representations and warranties of the Company are true and correct in all material respects (except to the extent that any of such representations and warranties is already qualified as to materiality in Section 3 of the Common Share Purchase Agreement, in which case, such representations and warranties are true and correct without further qualification) as of the date when made and as of the Commencement Date as though made at that time (except for representations and warranties that speak as of a specific date);

3. The Company has performed, satisfied and complied in all material respects with covenants, agreements and conditions required by the Transaction Documents to be performed, satisfied or complied with by the Company at or prior to the Commencement Date.

4. The Company has not taken any steps, and does not currently expect to take any steps, to seek protection pursuant to any Bankruptcy Law nor does the Company or any of its Subsidiaries have any knowledge or reason to believe that its creditors intend to initiate involuntary bankruptcy or insolvency proceedings. The Company is financially solvent and is generally able to pay its debts as they become due.

IN WITNESS WHEREOF, I have hereunder signed my name on this ___ day of _____.

_____
Name:
Title:

The undersigned as Secretary of Aptose Biosciences Inc., a corporation organized under the laws of Canada, hereby certifies that _____ is the duly elected, appointed, qualified and acting _____ of **APTOSE BIOSCIENCES INC.** and that the signature appearing above is his/her genuine signature.

_____
Secretary

EXHIBIT B

FORM OF COMPANY RESOLUTIONS
FOR SIGNING PURCHASE AGREEMENT

WHEREAS, management has reviewed with the Board of Directors the background, terms and conditions of the transactions subject to the proposed Common Share Purchase Agreement (the "**Purchase Agreement**") by and between the Company and Aspire Capital Fund, LLC ("**Aspire Capital**"), including all materials terms and conditions of the transactions subject thereto, providing for the purchase by Aspire Capital of up to Twenty Million Dollars ($20,000,000) of the Company's common shares, without par value (the "**Common Shares**");

WHEREAS, after careful consideration of the Purchase Agreement, the documents incident thereto and other factors deemed relevant by the Board of Directors, the Board of Directors has determined that it is advisable and in the best interests of the Company to engage in the transactions contemplated by the Purchase Agreement (the "**Offering**"), including, but not limited to, the issuance of $360,000 of Common Shares to Aspire Capital at a price per share based on the five-day volume weighted average trading price of the Common Shares on the NASDAQ Capital Market ("**NASDAQ**") during the 5 days prior to the execution of the Purchase Agreement as a commitment fee (the "**Commitment Shares**") and the sale of additional Common Shares to Aspire Capital up to the available amount under the Purchase Agreement (the "**Purchase Shares**", and together with the Commitment Shares, the "**Aspire Shares**");

WHEREAS on March 12, 2019, the Company filed a base shelf prospectus (the "**Shelf Prospectus**") with the United States Securities and Exchange Commission (the "**SEC**") for the offering of up to US$100,000,000 Common Shares, warrants or units of the Company, and such registration statement was declared effective by the SEC on April 25, 2019 (the "**Registration Statement**");

WHEREAS the Company intends to file with the SEC a prospectus supplement (the "**Prospectus Supplement**") to the Shelf Prospectus qualifying the offer and sale of Common Shares having an aggregate offering price of up to US$20,360,000 (including the Commitment Shares), a draft of which has been provided to the board of directors of the Company (the "**Board**");

WHEREAS the Company will be required to execute and deliver certain agreements and documents to complete the transactions contemplated hereby;

WHEREAS the Company proposes to list the Common Shares on the Toronto Stock Exchange and the NASDAQ Capital Market;

Transaction Documents

IT IS RESOLVED, that the Company be and it hereby is authorized to execute the Purchase Agreement providing for the purchase of common shares of the Company having an aggregate value of up to $20,000,000 and the issuance of the Commitment Shares having an aggregate value of $360,000;

IT IS RESOLVED, that the terms and provisions of the Form of Transfer Agent Instructions (the "**Instructions**") are hereby approved and the President and Chief Executive Officer and the Senior Vice President and Chief Financial Officer (the "**Authorized Officers**") are authorized to execute and deliver the Instructions (pursuant to the terms of the Purchase Agreement), with such amendments, changes, additions and deletions as the Authorized Officers may deem appropriate and approve on behalf of, the Company, such approval to be conclusively evidenced by the signature of an Authorized Officer thereon;

Issuance of Common Shares

IT IS RESOLVED, that the Company is hereby authorized to issue the Commitment Shares to Aspire Capital and that upon issuance of the Commitment Shares pursuant to the Purchase Agreement, the Commitment Shares shall be duly authorized, validly issued, fully paid and non-assessable;

IT IS RESOLVED, that the Company is hereby authorized to issue Common Shares upon the purchase of Purchase Shares up to the available amount under the Purchase Agreement in accordance with the terms of the Purchase Agreement and that, upon issuance of the Purchase Shares pursuant to the Purchase Agreement, the Purchase Shares will be duly authorized, validly issued, fully paid and non-assessable;

Listing of Shares on the Exchanges

IT IS RESOLVED, that the officers of the Company with the assistance of counsel be, and each of them hereby is, authorized and directed to take all necessary steps and do all other things necessary and appropriate to effect the listing of the Aspire Shares on the NASDAQ and the Toronto Stock Exchange;

Prospectus Supplement

IT IS RESOLVED to authorize and approve the Prospectus Supplement, substantially in the forms provided to the Board, subject to such amendments, changes, additions and deletions as any director or officer of the Company may approve;

IT IS RESOLVED to authorize any director or officer of the Company to file or cause to be filed the Prospectus Supplement with the SEC and to file all such other documents and supporting material and to execute and deliver all such documents and instruments and to do all such other acts and things as in the opinion of any such director or officer may be necessary or desirable to give full effect to this resolution;

Press Release

IT IS RESOLVED to authorize the Company to issue, when appropriate, a press release announcing the Offering (the "Press Release");

IT IS RESOLVED to authorize any officer or director to approve the Press Release;

General

IT IS RESOLVED, that, without limiting the foregoing, the Authorized Officers are, and each of them hereby is, authorized and directed to proceed on behalf of the Company and to take all such steps as deemed necessary or appropriate, with the advice and assistance of counsel, to cause the Company to consummate the agreements referred to herein and to perform its obligations under such agreements; and

IT IS RESOLVED, that the Authorized Officers be, and each of them hereby is, authorized, empowered and directed on behalf of and in the name of the Company, to take or cause to be taken all such further actions and to execute and deliver or cause to be executed and delivered all such further agreements, amendments, documents, certificates, reports, schedules, applications, notices, letters and undertakings and to incur and pay all such fees and expenses as in their judgment shall be necessary, proper or desirable to carry into effect the purpose and intent of any and all of the foregoing resolutions, and that all actions heretofore taken by any officer or director of the Company in connection with the transactions contemplated by the agreements described herein are hereby approved, ratified and confirmed in all respects;

IT IS RESOLVED, that any and all actions heretofore or hereinafter taken on behalf of the Company by any of said persons or entities within the terms of the foregoing resolutions are hereby approved, ratified and confirmed in all respects as the acts and deeds of the Company; and

IT IS RESOLVED to approve and ratify any and all acts of any nature previously performed by the directors and officers of the Company in connection with the Offering.

EXHIBIT C

FORM OF SECRETARY'S CERTIFICATE

This Secretary's Certificate (the "**Certificate**") is being delivered pursuant to Section 7(k) of that certain Common Share Purchase Agreement dated as of May 7, 2019 (the "**Common Share Purchase Agreement**"), by and between **APTOSE BIOSCIENCES INC.**, a corporation organized under the laws of Canada (the "**Company**") and **ASPIRE CAPITAL FUND, LLC**, an Illinois limited liability company (the "**Buyer**"), pursuant to which the Company may sell to the Buyer up to Twenty Million Dollars ($20,000,000) of the Company's common shares without par value (the "**Common Shares**"). Terms used herein and not otherwise defined shall have the meanings ascribed to them in the Common Share Purchase Agreement.

The undersigned, _____ Secretary of the Company, hereby certifies as follows in his capacity as such:

1. I am the Secretary of the Company and make the statements contained in this Secretary's Certificate.

2. Attached hereto as Exhibit A and Exhibit B are true, correct and complete copies of the Company's bylaws ("**Bylaws**") and Certificate of Incorporation ("**Certificate of Incorporation**"), respectively, in each case, as amended through the date hereof, and no action has been taken by the Company, its directors, officers or shareholders, in contemplation of the filing of any further amendment relating to or affecting the Bylaws or Articles.

3. Attached hereto as Exhibit C are true, correct and complete copies of the resolutions duly adopted by the Board of Directors of the Company on _____, 201__. Such resolutions have not been amended, modified or rescinded and remain in full force and effect and such resolutions are the only resolutions adopted by the Company's Board of Directors, or any committee thereof, or the shareholders of the Company relating to or affecting (i) the entering into and performance of the Common Share Purchase Agreement, or the issuance, offering and sale of the Purchase Shares and the Commitment Shares and (ii) and the performance of the Company of its obligation under the Transaction Documents as contemplated therein.

4. As of the date hereof, the authorized, issued and reserved capital of the Company is as set forth on Exhibit D hereto.

IN WITNESS WHEREOF, I have hereunder signed my name on this ___ day of _____.

_____
_____, Secretary

The undersigned as _____ of **APTOSE BIOSCIENCES INC.**, a corporation organized under the laws of Canada, hereby certifies that _____ is the duly elected, appointed, qualified and acting Secretary of **APTOSE BIOSCIENCES INC.**, and that the signature appearing above is his/her genuine signature.

_____

Exhibit 10.2

Execution Copy

REGISTRATION RIGHTS AGREEMENT

REGISTRATION RIGHTS AGREEMENT (this "**Agreement**"), dated as of May 7, 2019, by and between **APTOSE BIOSCIENCES INC.,** a corporation organized under the laws of Canada (the "**Company**"), and **ASPIRE CAPITAL FUND, LLC,** an Illinois limited liability company (together with its permitted assigns, the "**Buyer**"). Capitalized terms used herein and not otherwise defined herein shall have the respective meanings set forth in the Common Share Purchase Agreement by and between the parties hereto, dated as of the date hereof (as amended, restated, supplemented or otherwise modified from time to time, the "**Purchase Agreement**").

WHEREAS:

A. Upon the terms and subject to the conditions of the Purchase Agreement, (i) the Company has agreed to issue to the Buyer, and the Buyer has agreed to purchase, up to Twenty Million Dollars ($20,000,000) of common shares of the Company without par value (the "**Common Shares**"), pursuant to Section 1 of the Purchase Agreement (such shares, the "**Purchase Shares**"), and (ii) the Company has agreed to issue to the Buyer such number of shares of Common Shares as is required pursuant to Section 4(e) of the Purchase Agreement (the **"Commitment Shares"**); and

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

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

1. DEFINITIONS.

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

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

b. **"Prospectus"** means the base prospectus, including all documents incorporated therein by reference, included in any Registration Statement (as hereinafter defined), as it may be supplemented by a prospectus or the Prospectus Supplement (as hereinafter defined), in the form in which such prospectus and/or Prospectus Supplement have most recently been filed by the Company with the U.S. Securities and Exchange Commission (the "**SEC**") pursuant to Rule 424(b) under the 1933 Act, together with any then issued "issuer free writing prospectus(es)," as defined in Rule 433 under the 1933 Act, relating to the Registrable Securities.

c. "**Register**," "**registered**," and "**registration**" refer to a registration effected by preparing and filing one or more registration statements of the Company under the 1933 Act and pursuant to Rule 415 under the 1933 Act or any successor rule providing for offering securities on a continuous basis ("**Rule 415**"), and the declaration or ordering of effectiveness of such registration statement(s) by the SEC.

d. "**Registrable Securities**" means the Purchase Shares that may from time to time be issued or issuable to the Buyer upon purchases of the Available Amount under the Purchase Agreement (without regard to any limitation or restriction on purchases), the Commitment Shares issued or issuable to the Buyer, and any Common Shares issued or issuable with respect to the Purchase Shares, the Commitment Shares or the Purchase Agreement as a result of any stock split, stock dividend, recapitalization, exchange or similar event, without regard to any limitation on purchases under the Purchase Agreement.

e. "**Registration Statement**" means the Shelf Registration Statement and any other registration statement of the Company, as amended when it became effective, including all documents filed as part thereof or incorporated by reference therein, and including any information contained in a Prospectus subsequently filed with the SEC pursuant to Rule 424(b) under the 1933 Act or deemed to be a part of such registration statement pursuant to Rule 430B or 462(b) of the 1933 Act, or similar rules, covering only the sale of the Registrable Securities.

f. "**Shelf Registration Statement**" means the Company's existing registration statement on Form S-3 (File No. 333-230218).

2. REGISTRATION.

a. Mandatory Registration. The Company shall within two (2) Business Days from the Commencement Date file with the SEC a prospectus supplement to the Shelf Registration Statement specifically relating to the Registrable Securities (the "**Prospectus Supplement**"). The Buyer and its counsel shall have had a reasonable opportunity to review and comment upon such Prospectus Supplement prior to its filing with the SEC. The Buyer shall furnish all information reasonably requested by the Company for inclusion therein. The Company shall use its reasonable best efforts to keep the Shelf Registration Statement effective pursuant to Rule 415 promulgated under the 1933 Act and available for sales of all of the Registrable Securities at all times until the earlier of (i) the Company no longer qualifies to make sales under the Shelf Registration Statement (which shall be understood to include the inability of the Company to immediately register sales of Registrable Securities to the Buyer under the Shelf Registration Statement or any New Registration Statement (as defined below) pursuant to General Instruction I.B.6 of Form S-3), (ii) the date on which the Company shall have sold all the Registrable Securities and no Available Amount remains under the Purchase Agreement, or (iii) the date on which the Purchase Agreement is terminated (the "**Registration Period**"). The Shelf Registration Statement (including any amendments or supplements thereto and prospectuses contained therein) shall not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein, or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading.

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

c. Sufficient Number of Shares Registered. In the event the number of Common Shares available under the Shelf Registration Statement is insufficient to cover the Registrable Securities, the Company shall, to the extent necessary and permissible, amend the Shelf Registration Statement or file a new registration statement (a "**New Registration Statement**"), so as to cover all of such Registrable Securities as soon as reasonably practicable, but in any event not later than ten (10) Business Days after the necessity therefor arises. The Company shall use its reasonable best efforts to have such amendment and/or New Registration Statement become effective as soon as reasonably practicable following the filing thereof.

3. RELATED OBLIGATIONS.

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

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

b. The Company shall submit to the Buyer for review and comment any disclosure in the Registration Statement, and all amendments and supplements thereto (other than prospectus supplements that consist only of a copy of a filed Form 10-K, Form 10-Q or Current Report on Form 8-K or any amendment as a result of the Company's filing of a document that is incorporated by reference into the Registration Statement), containing information provided by the Buyer for inclusion in such document and any descriptions or disclosure regarding the Buyer, the Purchase Agreement, including the transaction contemplated thereby, or this Agreement at least two (2) Business Days prior to their filing with the SEC, and not file any document in a form to which Buyer reasonably and timely objects. Upon request of the Buyer, the Company shall provide to the Buyer all disclosure in the Registration Statement and all amendments and supplements thereto (other than prospectus supplements that consist only of a copy of a filed Form 10-K, Form 10-Q or Current Report on Form 8-K or any amendment as a result of the Company's filing of a document that is incorporated by reference into a Registration Statement) at least two (2) Business Days prior to their filing with the SEC, and not file any document in a form to which Buyer reasonably and timely objects. The Buyer shall use its reasonable efforts to comment upon the Registration Statement or any New Registration Statement and any amendments or supplements thereto within two (2) Business Days from the date the Buyer receives the final version thereof. The Company shall furnish to the Buyer, without charge, any correspondence from the SEC or the staff of the SEC to the Company or its representatives relating to any Registration Statement.

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

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

e. Subject to Permitted Delays, as promptly as reasonably practicable after becoming aware of such event or facts, the Company shall notify the Buyer in writing if the Company has determined that the Prospectus included in any Registration Statement, as then in effect, includes an untrue statement of a material fact or omits to state a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading, and as promptly as reasonably practical (taking into account the Company's good faith assessment of any adverse consequences to the Company and its shareholders of premature disclosure of such event or facts) prepare a prospectus supplement or amendment to such Registration Statement to correct such untrue statement or omission, and, upon the Buyer's request, deliver a copy of such prospectus supplement or amendment to the Buyer. In providing this notice to the Buyer, the Company shall not include any other information about the facts underlying the Company's determination and shall not in any way communicate any material nonpublic information about the Company or the Common Shares to the Buyer. The Company shall also promptly notify the Buyer in writing (i) when a prospectus or any prospectus supplement or post-effective amendment has been filed, and when a Registration Statement or any post-effective amendment has become effective (notification of such effectiveness shall be delivered to the Buyer by facsimile or e-mail on the same day of such effectiveness), (ii) of any request by the SEC for amendments or supplements to any Registration Statement or related prospectus or related information, and (iii) of the Company's reasonable determination that a post-effective amendment to a Registration Statement would be appropriate. In no event shall the delivery of a notice under this Section 3(e), or the resulting unavailability of a Registration Statement, without regard to its duration, for disposition of securities by Buyer be considered a breach by the Company of its obligations under this Agreement. The preceding sentence in this Section 3(e) does not limit whether an event of default has occurred as set forth in Section 9(a) of the Purchase Agreement.

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

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

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

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

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

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

l. If reasonably requested by the Buyer, the Company shall deliver to the Buyer a written confirmation from Company's counsel of whether or not the effectiveness of such Registration Statement has lapsed at any time for any reason (including, without limitation, the issuance of a stop order) and whether or not the Registration Statement is currently effective and available to the Company for sale of all of the Registrable Securities.

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

4. OBLIGATIONS OF THE BUYER.

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

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

5. EXPENSES OF REGISTRATION.

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

6. INDEMNIFICATION.

a. To the fullest extent permitted by law, the Company will, and hereby does, indemnify, hold harmless and defend the Buyer, each Person, if any, who controls the Buyer, the members, the directors, officers, partners, employees, agents, representatives of the Buyer and each Person, if any, who controls the Buyer within the meaning of the 1933 Act or the Securities Exchange Act of 1934, as amended (the "**1934 Act**") (each, an "**Indemnified Person**"), against any third party losses, claims, damages, liabilities, judgments, fines, penalties, charges, costs, reasonable attorneys' fees, amounts paid in settlement (with the prior consent of the Company, such consent not to be unreasonably withheld) or reasonable expenses, (collectively, "**Claims**") reasonably incurred in investigating, preparing or defending any action, claim, suit, inquiry, proceeding, investigation or appeal taken from the foregoing by or before any court or governmental, administrative or other regulatory agency or body or the SEC, whether pending or threatened, whether or not an indemnified party is or may be a party thereto ("**Indemnified Damages**"), to which any of them may become subject insofar as such Claims (or actions or proceedings, whether commenced or threatened, in respect thereof) arise out of or are based upon: (i) any untrue statement or alleged untrue statement of a material fact in the Shelf Registration Statement, any New Registration Statement or any post-effective amendment thereto or in any filing made in connection with the qualification of the offering under the securities or other "blue sky" laws of any jurisdiction in which Registrable Securities are offered ("**Blue Sky Filing**"), or the omission or alleged omission to state a material fact required to be stated therein or necessary to make the statements therein not misleading, (ii) any untrue statement or alleged untrue statement of a material fact contained in the final Prospectus or the omission or alleged omission to state therein any material fact necessary to make the statements made therein, in light of the circumstances under which the statements therein were made, not misleading, or (iii) any violation or alleged violation by the Company of the 1933 Act, the 1934 Act, any other law, including, without limitation, any state securities law, or any rule or regulation thereunder relating to the offer or sale of the Registrable Securities pursuant to the Shelf Registration Statement or any New Registration Statement (the matters in the foregoing clauses (i) through (iii) being, collectively, "**Violations**"). The Company shall reimburse each Indemnified Person promptly as such expenses are incurred and are due and payable, for any reasonable legal fees or other reasonable expenses incurred by them in connection with investigating or defending any such Claim. Notwithstanding anything to the contrary contained herein, the indemnification agreement contained in this Section 6(a): (A) shall not apply to a Claim by an Indemnified Person arising out of or based upon a Violation which occurs in reliance upon and in conformity with information furnished in writing to the Company by the Buyer or such Indemnified Person expressly for use in connection with the preparation of the Registration Statement, any New Registration Statement, the Prospectus or any such amendment thereof or supplement thereto, if such prospectus was timely made available by the Company; (B) with respect to any superseded prospectus, shall not inure to the benefit of any such person from whom the person asserting any such Claim purchased the Registrable Securities that are the subject thereof (or to the benefit of any other Indemnified Person) if the untrue statement or omission of material fact contained in the superseded prospectus was corrected in the revised prospectus, as then amended or supplemented, if such revised prospectus was timely made available by the Company pursuant to Section 3(c) or Section 3(e), and the Indemnified Person was promptly advised in writing not to use the incorrect prospectus prior to the use giving rise to a violation; (C) shall not be available to the extent such Claim is based on a failure of the Buyer to deliver, or to cause to be delivered, the prospectus made available by the Company, if such prospectus was theretofore made available by the Company pursuant to Section 3(c) or Section 3(e); and (D) shall not apply to amounts paid in settlement of any Claim if such settlement is effected without the prior written consent of the Company, which consent shall not be unreasonably withheld. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of the Indemnified Person and shall survive the transfer of the Registrable Securities by the Buyer pursuant to Section 8.

b. In connection with the Shelf Registration Statement, any New Registration Statement or Prospectus, the Buyer agrees to indemnify, hold harmless and defend, to the same extent and in the same manner as is set forth in Section 6(a), the Company, each of its directors, each of its officers who signed the Shelf Registration Statement or signs any New Registration Statement, each Person, if any, who controls the Company within the meaning of the 1933 Act or the 1934 Act (collectively and together with an Indemnified Person, an "**Indemnified Party**"), against any Claim or Indemnified Damages to which any of them may become subject, under the 1933 Act, the 1934 Act or otherwise, insofar as such Claim or Indemnified Damages arise out of or are based upon any Violation, in each case to the extent, and only to the extent, that such Violation occurs in reliance upon and in conformity with written information about the Buyer set forth on Exhibit A attached hereto or updated from time to time in writing by the Buyer and furnished to the Company by the Buyer expressly for inclusion in the Shelf Registration Statement or Prospectus or any New Registration Statement or from the failure of the Buyer to deliver or to cause to be delivered the prospectus made available by the Company, if such prospectus was timely made available by the Company pursuant to Section 3(c) or Section 3(e); and, subject to Section 6(d), the Buyer will reimburse any legal or other expenses reasonably incurred by them in connection with investigating or defending any such Claim; provided, however, that the indemnity agreement contained in this Section 6(b) and the agreement with respect to contribution contained in Section 7 shall not apply to amounts paid in settlement of any Claim if such settlement is effected without the prior written consent of the Buyer, which consent shall not be unreasonably withheld. Such indemnity shall remain in full force and effect and shall survive the transfer of the Registrable Securities by the Buyer pursuant to Section 8.

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

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

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

7. CONTRIBUTION.

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

8. ASSIGNMENT OF REGISTRATION RIGHTS.

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

9. AMENDMENT OF REGISTRATION RIGHTS.

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

10. MISCELLANEOUS.

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

If to the Company:

Aptose Biosciences Inc.
251 Consumers Road, Suite 1105
Toronto, Ontario M2J 4R3
Telephone: 650-718-5028
Facsimile: 905-234-2120
Attention: Gregory K. Chow, CFO
Email: gchow@aptose.com

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

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

If to the Buyer:

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

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

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

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

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

c. The laws of the Province of Ontario shall governall issues concerning the relative rights of the Company and its shareholders. All other questions concerning the construction, validity, enforcement and interpretation of this Agreement shall be governed by the internal laws of the State of Illinois, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of Illinois or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of Illinois. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of Chicago for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof to such party at the address for such notices to it under this Agreement and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. If any provision of this Agreement shall be invalid or unenforceable in any jurisdiction, such invalidity or unenforceability shall not affect the validity or enforceability of the remainder of this Agreement in that jurisdiction or the validity or enforceability of any provision of this Agreement in any other jurisdiction. **EACH PARTY HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION HEREWITH OR ARISING OUT OF THIS AGREEMENT OR ANY TRANSACTION CONTEMPLATED HEREBY.**

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

e. Subject to the requirements of Section 8, this Agreement shall inure to the benefit of and be binding upon the permitted successors and assigns of each of the parties hereto.

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

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

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

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

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

* * * * * *

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

THE COMPANY:

APTOSE BIOSCIENCES INC.

By: _____
Name: Gregory K. Chow
Title: Chief Financial Officer

BUYER:

ASPIRE CAPITAL FUND, LLC
BY: ASPIRE CAPITAL PARTNERS, LLC
BY: SGM HOLDINGS CORP.

By:_____
Name: Steven G. Martin
Title: President

EXHIBIT A

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

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

Exhibit 31.1

CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, William G. Rice, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Aptose Biosciences Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's fourth fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date:May 7, 2019

/s/ William G. Rice
Name: William G. Rice, Ph.D.
Title: President and Chief Executive Officer

Exhibit 31.2

CERTIFICATION PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Gregory K. Chow, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Aptose Biosciences Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's fourth fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: May 7, 2019

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

Exhibit 32.1

CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, I, William G. Rice, the President and Chief Executive Officer of Aptose Biosciences Inc. (the "Company"), hereby certify that, to my knowledge:

1. The Quarterly Report on Form 10-Q for the quarter ended March 31, 2019 (the "Report") of the Company fully complies with the requirements of Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: May 7, 2019

/s/ William G. Rice
Name: William G. Rice, Ph.D.
Title: President and Chief Executive Officer

Exhibit 32.2

CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, I, Gregory K. Chow, the Senior Vice President and Chief Financial Officer of Aptose Biosciences Inc. (the "Company"), hereby certify that, to my knowledge:

1. The Quarterly Report on Form 10-Q for the quarter ended March 31, 2019 (the "Report") of the Company fully complies with the requirements of Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: May 7, 2019

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