

# MANAGEMENT'S DISCUSSION AND ANALYSIS

For the three and nine months ended September 30, 2017

November 14, 2017

This Management's Discussion and Analysis ("MD&A") of Aptose Biosciences Inc. ("we", "our", "us" and similar expressions) for the interim period should be read in conjunction with our unaudited condensed consolidated interim financial statements for the three and nine months ended September 30, 2017 and 2016 which are incorporated by reference herein and form an integral part of this MD&A. Our September 30, 2017 interim financial statements and additional information about us, including the annual audited financial statements and MD&A as at December 31, 2016 and for the year then ended, and our annual report on form 20-F as at December 31, 2016 and for the year then ended can be found on SEDAR at [www.sedar.com](http://www.sedar.com) and EDGAR at [www.sec.gov/edgar.shtml](http://www.sec.gov/edgar.shtml).

*All amounts are expressed in Canadian dollars unless otherwise stated.*

## CAUTION REGARDING FORWARD-LOOKING STATEMENTS

*This management's discussion and analysis may contain forward-looking statements within the meaning of securities laws. Such statements include, but are not limited to, statements relating to:*

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

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

- *our ability to obtain the substantial capital we require to fund research and operations;*
- *our lack of product revenues and history of operating losses;*
- *our early stage of development, particularly the inherent risks and uncertainties associated with (i) developing new drug candidates generally, (ii) demonstrating the safety and efficacy of these drug candidates in clinical studies in humans, and (iii) obtaining regulatory approval to commercialize these drug candidates;*
- *our drug candidates require time-consuming and costly synthesis and formulation, preclinical and clinical testing and regulatory approvals before commercialization;*
- *clinical studies and regulatory approvals of our drug candidates are subject to delays, and may not be completed or granted on expected timetables, if at all, and such delays may increase our costs and could delay our ability to generate revenue;*
- *our reliance on external contract research/manufacturing organizations for certain activities;*
- *potential exposure to legal actions and potential need to take action against other entities;*
- *the regulatory approval process;*
- *our ability to recruit patients for clinical trials;*
- *the progress of our clinical trials;*
- *our ability to find and enter into agreements with potential partners;*
- *our ability to attract and retain key personnel;*
- *our ability to obtain and maintain patent protection;*
- *our ability to protect our intellectual property rights and not infringe on the intellectual property rights of others;*
- *our ability to comply with applicable governmental regulations and standards;*
- *development or commercialization of similar products by our competitors, many of which are more established and have or have access to greater financial resources than us;*
- *commercialization limitations imposed by intellectual property rights owned or controlled by third parties;*
- *potential product liability and other claims;*
- *our ability to maintain adequate insurance at acceptable costs;*
- *further equity financing, which may substantially dilute the interests of our existing shareholders;*
- *exposure to fluctuations of foreign currencies;*
- *changing market conditions; and*
- *other risks detailed from time-to-time in our on-going quarterly filings, annual information forms, annual reports and annual filings with Canadian securities regulators and the United States Securities and Exchange Commission, and those which are discussed under the heading "Risk Factors" in this document.*

Should one or more of these risks or uncertainties materialize, or should the assumptions set out in the section entitled “Risk Factors” underlying those forward-looking statements prove incorrect, actual results may vary materially from those described herein. These forward-looking statements are made as of the date of this management’s discussion and analysis or, in the case of documents incorporated by reference herein, as of the date of such documents, and we do not intend, and do not assume any obligation, to update these forward-looking statements, except as required by law. We cannot assure you that such statements will prove to be accurate as actual results and future events could differ materially from those anticipated in such statements. Investors are cautioned that forward-looking statements are not guarantees of future performance and accordingly investors are cautioned not to put undue reliance on forward-looking statements due to the inherent uncertainty therein.

## CORPORATE UPDATE

The following items highlight our corporate activities during the three and nine months ended September 30, 2017 and any subsequent development up until the date hereof.

## PROGRAM UPDATES

### *CG’806*

In June 2016, we announced a definitive agreement with South Korean company CrystalGenomics, Inc. (“CG”), granting us an exclusive option to research, develop and commercialize CG026806 (“CG’806”) in all countries of the world except the Republic of Korea and China, for all fields of use. CG’806 is a highly potent, orally bioavailable non-covalent small molecule being developed for acute myeloid leukemia (AML) and certain B cell malignancies because of its actions as a pan-FLT3/pan-BTK inhibitor. We paid US\$1.0 million (the “Option Grant Fee”) to CG to acquire the option. Should we elect to exercise the option, upon exercise, we would pay an additional US\$2.0 million (the “Option Exercise Fee”) in cash or combination of cash and common shares, and would receive full development and commercial rights for the program in all territories outside of the Republic of Korea and China. The option fee is due on the earlier of (i) filing of an Investigational New Drug (“IND”) application with the Food and Drug Administration (“FDA”), (ii) first dosage of a human in a clinical trial or (iii) or June 2018.

CG’806 exhibits a picomolar IC<sub>50</sub> toward the FMS-like tyrosine kinase 3 (FLT3) with the Internal Tandem Duplication (“FLT3-ITD”), potency against the wild type FLT3 and a host of mutant forms of FLT3, as well as single-digit nanomolar IC<sub>50</sub>’s against Bruton’s tyrosine kinase (“BTK”) and its C481S mutant (“BTK-C481S”). Consequently, CG’806 is characterized as a pan-FLT3/pan-BTK inhibitor. Further, CG’806 represents a multi-kinase inhibitor that also impacts a small group of other relevant oncogenic targets, including the Aurora kinases (“AURK”), RET, MET, DDR2, TRK and SRC kinases that are operative in AML and certain B cell malignancies.

As a potent inhibitor of FLT3-ITD, CG’806 may become an effective therapy in a high-risk subset of AML patients. This is because the FLT3-ITD mutation occurs in approximately 30% of patients with AML and is associated with a poor prognosis. In murine xenograft studies of human AML (FLT3-ITD), CG’806 administered orally once daily for 14 days resulted in tumor elimination without measurable toxicity. Importantly, CG’806 targets other oncogenic kinases which may also be operative in FLT3-ITD AML, including wild type FLT3, BTK, AURK, RET and SRC family kinases, thereby potentially allowing the agent to become an important therapeutic option for a broader group of this difficult-to-treat AML patient population. The findings that CG’806 targets all forms of FLT3 and other oncogenic pathways, and that CG’806 was well tolerated from a safety perspective during efficacy studies, suggest that CG’806 may also have applicability in treating patients, particularly those over the age of 65, who cannot tolerate other therapies.

Separate from the AML and FLT3 story, overexpression of the BTK enzyme can drive oncogenic expression of certain B cell malignancies, such as chronic lymphocytic leukemia (CLL), mantle cell lymphoma (MCL), diffuse large cell B cell lymphoma (DLBCL) and others. Therapy of these patients with covalent, irreversible BTK inhibitors, such as ibrutinib, that target the active site Cysteine (“Cys”) residue of BTK can be beneficial in many patients. However, therapy with covalent BTK inhibitors can select for BTK with a C481S mutation, thereby conferring resistance to covalent BTK inhibitors. Furthermore, approximately half of CLL patients have discontinued treatment with ibrutinib after 3.4 years of therapy due to the development of resistance (in particular, patients having tumors that developed the BTK-C481S mutation), refractory properties (patient tumors did not respond to ibrutinib), or intolerance (side effects led to discontinuation of ibrutinib), according to a study performed at The Ohio State University. As a non-covalent, reversible inhibitor of BTK, CG’806 does not rely on the Cysteine 481 residue (C481) for inhibition of the BTK enzyme. Indeed, recent X-ray crystallographic studies (with wild type and C481S BTK) demonstrated that CG’806 binds productively to the BTK active site in a position that is indifferent to the presence or absence of mutations at the 481 residue. Moreover, in vitro studies demonstrated that CG’806 kills B cell malignancy cell lines approximately 1000 times more potently than ibrutinib, and CG’806 demonstrated a high degree of safety in animal efficacy studies. Consequently, patients who have relapsed, are refractory or intolerant to ibrutinib or other commercially approved or development stage BTK inhibitors with B cell malignancies may continue to be sensitive to CG’806 therapy. This is particularly true since CG’806 inhibits the wild type and mutant forms of BTK, as well as other kinases that drive the survival and proliferation of B cell malignancies.

We have invested significant time, effort and capital to create a scalable synthetic route for the manufacture of CG’806 drug substance, to develop an oral formulation for clinical development, and to study the actions of CG’806 in various preclinical

biological pathway studies. We now have solved the synthetic route, can scale the manufacture of API, and now have manufactured and delivered a batch of API which will be used for planned Dose Range Finding Studies and toxicology studies. Likewise, we also reported that we selected the oral formulation that we intend to take into first-in-human clinical trials. Provided the studies continue on the anticipated timeline, we expect to initiate a first-in-human clinical trial during 2018, and greater granularity on the timing of the IND submission and clinical trial will be provided in the coming months. CG'806 is being developed with the intent to deliver the agent as an oral therapeutic and to develop it in parallel for AML and for appropriate B cell malignancies (likely CLL).

On May 7, 2017, we presented preclinical data for our pan-FLT3/pan-BTK inhibitor CG'806 at the 2017 American Association for Cancer Research (AACR) Conference for Hematologic Malignancies: Translating Discoveries to Novel Therapies in Boston, MA. Two separate presentations highlighting CG'806 were presented. In one presentation, our scientists, with researchers from the Knight Cancer Institute at Oregon Health & Science University (OHSU), presented data relating to the potency of CG'806 against samples derived from patients with various hematologic malignancies. In a separate presentation, our scientists, with researchers from the MD Anderson Cancer Center, presented data demonstrating CG'806's potent activity against AML cells harboring wild type or specific mutant forms of FLT3.

On August 4, 2017 we received a notice from the USPTO stating that our U.S. Patent Application is allowed for issuance as a patent. The allowed application 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. The notice of allowance is not a grant of patent rights and although it is uncommon, the USPTO can withdraw the allowed application from issuance.

Finally, as announced on November 1, 2017, five abstracts related to the mechanistic properties of CG'806 in AML cells and in B cell malignancy cells have been accepted by the 2017 Meeting of the American Society of Hematology ("ASH") and three of the abstracts will be presented during the meeting.

## **APTO-253**

### ***Phase Ib Trial***

APTO-253, a small molecule c-Myc inhibitor, was being evaluated by us in a Phase Ib clinical trial in patients with relapsed / refractory hematologic malignancies, particularly AML and high-risk myelodysplastic syndromes ("MDS") before being placed on clinical hold by the FDA in November 2015. If and when the APTO-253 clinical trial is re-initiated, upon completion of the dose-escalation stage of the study and determination of the appropriate dose, the plan would be to enroll additional AML patients for a disease-specific single-agent expansion cohorts. For future development, upon selection of a lead hematologic indication from this Phase Ib study, combination of APTO-253 with a standard therapy would be considered.

### ***Clinical Hold and Current Status***

As previously disclosed, 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 announced that we had successfully manufactured multiple non-GMP batches of a new drug product formulation for APTO-253, including a batch that had been stable and soluble for over six months. However, the 40L 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. On January 23, 2017, we announced that the root cause and corrective action studies would take longer than originally expected and that we would temporarily delay clinical activities with APTO-253 in order to elucidate the cause of manufacturing setback, with the intention of restoring the molecule to a state supporting clinical development and partnering. Formal root cause analyses studies have now been completed and have identified the reason for the drug product stability failure, and we have established a corrective and prevention action plan for the manufacture of future batches of drug product. Given these findings, we plan to manufacture a new clinical supply of drug product, perform all of the anticipated studies required to demonstrate fitness of the drug product for clinical usage, and then present the findings to the FDA with the hope of having the clinical hold removed and returning APTO-253 to the clinical trial. However, there can be no assurance that the FDA will remove the clinical hold.

Finally, two abstracts related to the mechanistic properties of APTO-253 were submitted to the 2017 Meeting of the American Society of Hematology ("ASH") and these abstracts will be published on the ASH website.

### ***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 ("Moffitt"), 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 us have suspended work on the program, and the collaboration with LALS has been terminated. However, the program delivered novel intellectual property and hit molecules for further optimization. As a consequence, we may choose to out-license the program.

## **FINANCING ACTIVITIES**

### ***At-The-Market (“ATM”) Facility***

On April 2, 2015, we entered into an at-the-market equity facility (“ATM Facility”) with Cowen and Company, LLC, acting as sole agent. Under the terms of this facility, we may, from time to time, sell common shares having an aggregate offering value of up to US\$20.0 million through Cowen and Company, LLC. We determine, at our sole discretion, the timing and number of shares to be sold under the ATM Facility.

During the nine months ended September 30, 2017, we issued and sold 8,858,252 common shares through the ATM Facility, raising net proceeds of approximately US\$10.2 million (\$13.5 million). Costs associated with the sale of shares under the ATM Facility included a 3% cash commission as well as legal and accounting fees.

On a cumulative basis to September 30, 2017, we have issued and sold common shares under the ATM Facility for gross proceeds of approximately US\$16.67 million, leaving approximately US\$3.33 million available for future issuance prior to the expiration of the ATM facility in December 2017. Subsequent to September 30, 2017, we issued 1,488,231 additional common shares under the ATM Facility, for gross proceeds of approximately US\$2.17million.

### ***Common Shares Purchase Agreement***

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 US \$15.5 million of common shares to Aspire Capital. Under the terms of the Purchase Agreement, Aspire Capital has made an initial purchase of 357,143 common shares at a price of US\$1.40 per share, representing gross proceeds of approximately US\$500,000. Under the terms of the Purchase Agreement, Aspire Capital has committed to purchase up to an aggregate of US\$15.0 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. Under terms of the Purchase Agreement, we also issued 321,429 common shares to Aspire Capital as consideration for Aspire Capital entering into the Purchase Agreement. This transaction will be accounted for in the three months ended December 31, 2017.

We intend to use this equity arrangement as an additional option to assist us in achieving our capital objectives. The equity line provides us with the opportunity to regularly raise capital at prevailing market prices, at our sole discretion providing us with the ability to better manage our cash resources.

## **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.

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.

In managing our liquidity risk, we have considered our available cash and cash equivalents and have reprioritized our resources towards the development of CG’806. We have also considered additional cash raised through the ATM Facility for net proceeds of approximately CA\$13.5 million (US\$10.2 million) in the nine months ended September 30, 2017, and our ability to continue to raise funds under the ATM Facility in 2017 in assessing whether we will have sufficient resources to fund research and development operations through to at least the twelve month period ending September 30, 2018.

After considering the above factors, management has concluded that there are no material uncertainties related to events or conditions that may cast substantial doubt upon our ability to continue as a going concern. However, the estimates made by management in reaching this conclusion are based on information available as of the date of this MD&A. Accordingly, actual experience will differ from those estimates and the variation may be material.

## **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 MD&A. Other important accounting policies are described in note 3 of the audited financial statements for the year ended December 31, 2016.

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 document for a discussion of the factors considered by management in arriving at its assessment.

### ***Change in Functional Currency***

Effective January 1, 2017, we changed our functional currency to US dollars given the prevalence of US dollar denominated activities over time. Since our inception in 1988 to fiscal 2014, all operations of the entity were conducted in Canada and the Canadian dollar was determined to be the functional currency. During fiscal years 2015 and 2016, we gradually transitioned most of our research and development activities, including both headcount and studies, to the US and completed this transition in January 2017. Historically, our source of financing, with the exception of the recent ATM Facility and Purchase Agreement, have been in Canadian dollars and we have had a majority of our shareholders in Canada. Therefore, we have chosen to keep our presentation currency in Canadian dollars.

### ***Change in Accounting Policies***

Effective January 1, 2017, we changed our functional currency to US dollars. The change in functional currency from Canadian dollars to US dollars is accounted for prospectively from January 1, 2017. Our presentation currency is the Canadian dollar.

Foreign currency transactions are translated into US dollars at rates prevailing on the transaction dates. At the end of each reporting period, monetary assets and liabilities denominated in foreign currencies are translated into US dollars at the rates in effect at that date. Foreign exchange gains and losses are recorded in the consolidated statement of loss.

For financial statement presentation, unrealized foreign exchange gains and losses resulting from the translation to Canadian dollars are reported in other comprehensive income.

### **CASH POSITION**

At September 30, 2017, we had cash and cash equivalents and investments of \$13.6 million compared to cash and cash equivalents of \$10.7 million at December 31, 2016, cash and cash equivalents and investments of \$14.2 million at June 30, 2017 and cash and cash equivalents and investments of \$10.3 million at September 30, 2016.

We generally invest our cash in excess of current operational requirements in highly rated and liquid instruments. Investment decisions are made in accordance with an established investment policy administered by senior management and overseen by our Audit Committee and Board of Directors. As at September 30, 2017, our cash and cash equivalents consisted of cash of \$1.8 million (December 31, 2016 - \$3.9 million and September 30, 2016 - \$743 thousand) and in funds deposited into high interest savings accounts in both Canadian and US funds totaling \$8.02 million (December 31, 2016 - \$6.7 million and September 30, 2016 - \$9.6 million). Working capital (representing primarily cash, cash equivalents, investments and other current assets less current liabilities) at September 30, 2017 was \$12.1 million (December 31, 2016 - \$9.6 million and September 30, 2016 - \$8.7 million). Total assets as of September 30, 2017 total \$13.9 million (December 31, 2016 - \$11.6 million and September 30, 2016 - \$11.1 million).

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.

## RESULTS OF OPERATIONS

The results of operations for the three and nine months ended September 30, 2016 and 2017 are presented below:

(in thousands)	Three months ended September 30,		Nine months ended September 30,	
	2017	2016	2017	2016
Revenues	\$ -	\$ -	\$ -	\$ 0
Research and development expenses	1,744	2,164	5,501	7,772
General and administrative expenses	1,652	1,932	5,586	6,883
Net finance income (loss)	(86)	(79)	(181)	46
Net loss for the period	3,310	4,017	10,906	14,701
Foreign currency translation loss	531	-	1,019	-
Comprehensive loss for the period	3,841	4,017	11,925	14,701
Basic and diluted loss per common share	\$0.14	\$0.31	\$0.52	\$1.19

The decrease in the net loss during the three and nine months ended September 30, 2017 compared with the three and nine months ended September 30, 2016 results mostly from our decision in January 2017 to refocus our resources on our CG'806 development program and towards determining the root cause of the manufacturing issue with the APTO-253 program. Expenses were lower due to the cancellation of the LALS/Moffitt collaboration, lower costs associated with the APTO-253 program, and offset by increased development activities related to the CG'806 development program which were nominal in comparable periods, other than the license fee that was paid in June 2016 to acquire an option on the technology.

### Research and Development

*Components of research and development expenses*

The research and development expenses for the three and nine months ended September 30, 2016 and 2017 are as follows:

(in thousands)	Three months ended September 30,		Nine months ended September 30,	
	2017	2016	2017	2016
CrystalGenomics Option Fee	\$ -	\$ -	\$ -	\$ 1,294
Program costs – CG '806	799	78	1,818	97
Program costs – APTO-253	476	1,129	2,029	3,003
Program costs – LALS/Moffitt	-	347	-	1,296
Salaries	402	527	1,390	1,811
Stock-based compensation	56	71	222	236
Depreciation of equipment	11	12	42	35
	\$ 1,744	\$ 2,164	\$ 5,501	\$ 7,772

The changes in research and development expenses in the three months ended September 30, 2017 as compared to the three months ended September 30, 2016 result from the following:

- An increase in research and development activities related to our CG'806 development program. Activities in the current period ended September 30, 2017 included formulation studies and PK studies and the manufacturing of a first batch of the drug substance to be used in dose range finding studies. CG'806 program expenses were nominal in the comparative period as the technology was licensed to us in June 2016;
- Reduced expenditures on the APTO-253 program. In the period ended September 30, 2017, we completed the root cause analysis and determined the cause of the manufacturing issue, established a Corrective and Prevention Action (CAPA) plan to ensure the clinical supply can be manufactured in a reliable manner, and instructed a contract manufacturing organization (CMO) to initiate all activities required to manufacture a new clinical supply. In the comparative period, we were actively manufacturing a clinical batch and preparing to return APTO-253 to the clinic;
- Savings from cancellation of the LALS/Moffitt collaboration which was active in the three months ended September 30, 2016. There are no costs related to this program in the period ended September 30, 2017;
- Lower salaries expense mostly related to reduced headcount.

The changes in research and development expenses in the nine months ended September 30, 2017 as compared to the nine months ended September 30, 2016 result from the following:

- In the comparative nine month period, we paid US\$1.0 million (\$1.3 million) to CG for an option fee related to the CG'806 technology and in that period began research and development activities for this program.
- An increase in R&D activities on our CG'806 program as described above;
- A decrease in R&D activities on our APTO-253 program as described above;
- Savings from cancellation of the LALS/Moffitt collaboration as described above;
- Lower salaries expense mostly related to severance payments made in the three months ended March 31, 2016 when research headcount was reduced and savings resulting from the reduced headcount.

### **General and Administrative**

#### *Components of general and administrative expenses*

The general and administrative expenses for the three and nine months ended September 30, 2016 and 2017 are as follows:

(in thousands)	Three months ended September 30,		Nine months ended September 30,	
	2017	2016	2017	2016
General and administrative excluding salaries	\$ 894	\$ 733	\$ 2,591	\$ 2,688
Salaries	605	858	2,336	2,656
Stock-based compensation	138	320	614	1,476
Depreciation of equipment	15	21	45	63
	<b>\$ 1,652</b>	<b>\$ 1,932</b>	<b>\$ 5,586</b>	<b>\$ 6,883</b>

General and administrative expenses excluding salaries, increased in the three months ended September 30, 2017, compared with the three months ended September 30, 2016. The increase is mostly the result of higher investor relations, professional fees and travel costs in the period ended September 30, 2017. Salaries expenses in the three months ended September 30, 2017, decreased in comparison with the nine months ended September 30, 2016, due mostly to the reduced headcount.

General and administrative expenses excluding salaries, decreased in the nine months ended September 30, 2017, compared with the nine months ended September 30, 2016. The decrease is mostly the result of lower travel costs, consulting and rent costs in the first six months of the fiscal year related to cost containment initiatives taken in the prior fiscal year and offset by higher investor relations, professional fees and travel costs in the three months ended September 30, 2017. Salaries expenses in the nine months ended September 30, 2017, decreased in comparison with the nine months ended September 30, 2016, due mostly to the reduced headcount.

Stock-based compensation decreased in the three and nine months ended September 30, 2017, compared with the three and nine months ended September 30, 2016, due to large forfeitures in the three months ended March 31, 2017 and also due to grants in the prior periods having a greater fair value than the grants issued in the three and nine months ended September 30, 2017, and therefore contributing to higher stock-based compensation in the three and nine months period ended September 30, 2016.

### **QUARTERLY FINANCIAL INFORMATION (UNAUDITED)**

The selected financial information provided below is derived from our unaudited quarterly financial statements for each of the last eight quarters.

	Q3	Q2	Q1	Q4	Q3	Q2	Q1	Q4
(Amounts in 000's except for per common share data)	Sept 30, 2017	June 30, 2017	Mar 31, 2017	Dec 31, 2016	Sept 30, 2016	June 30, 2016	Mar 31, 2016	Dec 31, 2015
Revenue	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —
Research and development expense	1,744	1,462	2,295	2,550	2,164	3,293	2,315	2,340
General and administrative expense	1,652	1,833	2,101	1,461	1,932	2,343	2,608	2,364
Net loss	(3,310)	(3,241)	(4,355)	(3,926)	(4,017)	(5,612)	(5,072)	(4,431)
Basic and diluted net loss per share	(\$0.14)	(\$0.15)	(\$0.25)	(\$0.26)	(\$0.31)	(\$0.46)	(\$0.42)	(\$0.38)
Cash (used in) operating activities	\$(2,664)	\$(3,571)	\$(3,515)	\$(3,984)	\$(3,277)	\$(4,648)	\$(4,523)	\$(3,619)

Changes in research and development expenses follow the activities and stages of development of our programs. Specific activities or events that had significant impacts on the costs incurred for individual periods are as follows: In the nine months ended September 30, 2016 and the follow on quarters up to and including the three months ended December 31, 2016, research and development expenses increased due to the costs associated with the quality, manufacturing and formulation work to resolve the clinical hold of the APTO-253 trial previously described herein, as well as costs related to the collaboration with LALS/Moffitt. In the three months ended June 30, 2016, there is a further increase in expenses due to the \$1.3 million option fee paid to CG as previously described herein. For the three months ended March 31, 2017, cost savings from the cancellation of the LALS/Moffitt program are offset by increased costs related to the CG'806 program. For the three months ended June 30, 2017, there are further savings related to lower expense on the APTO-253 program related to our decision to refocus our resources towards CG'806. The increase in costs in the quarter ended September 30, 2017 are related mostly to development activities for the CG'806 development program.

Changes in general and administrative costs over time result mostly from changes in headcount, foreign exchange, the granting of stock options and decisions by us to engage in certain corporate projects. Specific activities that had significant impacts on the expenses incurred for individual periods are as follows: The increase in the three months ended March 31, 2016 is due to our US dollar expenses and payroll costs which were more costly due to the devaluation of the Canadian dollar over that time period. The decrease in general and administrative costs in the three months ended September 30, 2016, is primarily due to lower stock-based compensation expense and the completion of certain projects. The decrease in administrative costs in the three months ended December 31, 2016, was mainly due to the reversal of previously recognized bonus accruals. The expenses for the three months ended March 31, 2017, are comparable with the expenses recorded in the three months ended September 30, 2016 but slightly higher as a result of higher salaries expense related to severance payments made in the period. Lower expenses in the quarters ended June 30 and September 30, 2017 reflect mostly lower stock option compensation and lower salaries expense.

Cash used in operating activities fluctuates primarily as a result of changes in amounts of expenses incurred and the timing of payments.

## RELATED PARTY TRANSACTIONS

In March 2015, we entered into an agreement with the Moores Cancer Center at the University of California San Diego (UCSD) to provide us with pharmacology lab services. Dr. Stephen Howell serves as our Acting Chief Medical Officer and holds a faculty position as a Distinguished Professor of Medicine at UCSD and oversees the laboratory work. The research services were provided for an annual fee of US\$154,456 to be paid to UCSD in monthly installments. This research services agreement was approved by our Board of Directors on February 23, 2016, for an additional 12 month period beginning April 1, 2016 and for an annual fee of up to US\$200,000. In May 2017, we entered into another agreement with UCSD for an additional twelve month period for an annual fee of US\$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.

### *Contractual Obligations and Off-Balance Sheet Financing*

At September 30, 2017, we had contractual obligations requiring annual payments as follows:

	Less than 1 year	1 - 3 years	4 - 5 years	more than 5 years	Total
Operating leases	\$ 303	\$ 202	\$ nil	\$ nil	\$ 505

We have entered into various contracts with service providers with respect to the clinical development of APTO-253 and for our CG'806 development program. These contracts will result in future payments commitments of up to \$2.5 million.

As at September 30, 2017, we have not entered into any off-balance sheet arrangements other than the operating leases for our offices and labs and certain office equipment.

## FINANCIAL INSTRUMENTS

### (a) Financial instruments

(in thousands)	September 30, 2017	December 31, 2016
<b>Financial assets:</b>		
Cash and cash equivalents, consisting of high interest savings accounts, treasury bill and short-term bankers' acceptance measured at amortized cost	\$9,857	\$10,662

Investments, consisting of fixed income securities measured at amortized cost	3,734	-
<b><u>Financial liabilities:</u></b>		
Accounts payable and accrued liabilities measured at amortized cost	1,656	1,770

At September 30, 2017, there are no significant differences between the carrying values of these amounts and their estimated market values due to their short-term nature.

**(b) Financial risk management**

We have exposure to credit risk, liquidity risk and market risk. Our Board of Directors has the overall responsibility for the oversight of these risks and reviews our policies on an ongoing basis to ensure that these risks are appropriately managed.

**(i) Credit risk**

Credit risk is the risk of financial loss to us if a customer, partner or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from our cash and cash equivalents and investments. The carrying amount of the financial assets represents the maximum credit exposure.

We manage credit risk for our cash and cash equivalents and investments by maintaining minimum standards of R1-low or A-low investments and we invest only in highly rated Canadian corporations with debt securities that are traded on active markets and are capable of prompt liquidation.

**(ii) Liquidity risk**

Liquidity risk is the risk that we will not be able to meet our financial obligations as they come due. To the extent that we do not believe we have sufficient liquidity to meet our current obligations, the Board considers securing additional funds through equity or debt transactions. We manage our liquidity risk by continuously monitoring forecasts and actual cash flows. All of our financial liabilities are due within the current operating period.

In managing the liquidity risk, we have considered our available cash and cash equivalents and have reprioritized our resources towards the development of CG'806. We have also considered additional cash raised through our ATM Facility for net proceeds of approximately \$13.50 million (US\$10.2 million) in the nine months ended September 30, 2017, and our ability to continue to raise funds under this ATM Facility in 2017 in assessing whether it will have sufficient resources to fund research and development operations through to at least the twelve month period ending September 30, 2018.

After considering the above factors, management has concluded that there are no material uncertainties related to events or conditions that may cast substantial doubt upon our ability to continue as a going concern. However, the estimates made by management in reaching this conclusion are based on information available as of the date of this MD&A. Accordingly, actual experience will differ from those estimates and the variation may be material.

**(iii) Market risk**

Market risk is the risk that changes in market prices, such as interest rates, foreign exchange rates and equity prices will affect our income or the value of our financial instruments.

We are subject to interest rate risk on our cash and cash equivalents however we do not believe that the results of operations or cash flows would be affected to any significant degree by a sudden change in market interest rates relative to interest rates on the investments, owing to the relative short-term nature of the investments. We do not have any material interest bearing liabilities subject to interest rate fluctuations.

Currency risk is the risk that future cash flows of a financial instrument will fluctuate because of changes in foreign exchange rates. We are exposed to currency risk from employee costs as well as the purchase of goods and services in Canada and the cash balances held in foreign currencies. Fluctuations in the Canadian dollar exchange rate could potentially have an impact on our results. Assuming all other variables remain constant, a 10% depreciation or appreciation of the Canadian dollar against the US dollar would result in an increase or decrease in loss for the three months ended and comprehensive loss of \$103 thousand. Balances in foreign currencies at September 30, 2017, are as follows:

(in thousands)	Balances at September 30, 2017	Balances at December 31, 2016
Cash and cash equivalents	\$ 1,429	\$ 2,867
Accounts payable and accrued liabilities	(293)	(275)
	\$ 1,136	\$ 2,592

We do not have any forward exchange contracts to hedge this risk.

We do not invest in equity instruments of other corporations.

### **(c) Capital management**

Our primary objective when managing capital is to ensure that we have sufficient cash resources to fund our development activities and to maintain our ongoing operations. To secure the additional capital necessary to pursue these plans, we may attempt to raise additional funds through the issuance of equity or by securing strategic partners.

We include cash and cash equivalents and investments in the definition of capital.

We are not subject to externally imposed capital requirements and there has been no change with respect to the overall capital risk management strategy during the three months ended September 30, 2017.

## **OUTLOOK**

Until one of our drug candidates receives regulatory approval and is successfully commercialized, we will continue to incur operating losses. The magnitude of these operating losses will be largely affected by the timing and scope of future research and development, clinical trials and our ability to raise additional and ongoing working capital and/or establish effective partnerships to share the costs of development and clinical trials.

## **RISK FACTORS**

Investing in our securities involves a high degree of risk. Before making an investment decision with respect to our common shares, you should carefully consider the following risk factors, in addition to the other information included or incorporated by reference into the most recently filed annual information form and in our most recent Annual Report on Form 20-F filed with the SEC, as well as our historical consolidated financial statements and related notes. Management has reviewed our operations in conjunction with the Board of Directors and identified the following risk factors which are monitored on a bi-annual basis and reviewed with the Board of Directors. The risks set out below are not the only risks we face. If any of the following risks occurs, our business, financial condition, prospects or results of operations and cash flows would likely suffer. In that case, the trading price of our common shares could decline and you may lose all or part of the money you paid to buy our common shares.

Please refer to our MD&A, annual information form for the year ended December 31, 2016, and Annual Report on Form 20-F for the year ended December 31, 2016 for a complete discussion of risks and uncertainties.

- We are at an early stage of development. Significant additional investment will be necessary to complete the development of any of our products to approval.
- We need to raise additional capital. Due to our lack of product revenues, 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 issuances, debt issuances, 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.
- We have a history of operating losses. We expect to incur net losses and we may never achieve or maintain profitability.
- Clinical trials are long in duration, expensive and uncertain processes and the FDA may ultimately not approve any of our product candidates. We may never develop any commercial drugs or other products that generate revenues.
- We may not achieve our projected development goals in the time frames we announce and expect.
- Delays in clinical testing could result in delays in commercializing our product candidates and our business may be substantially harmed.
- 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.
- If we have difficulty enrolling patients in clinical trials, the completion of the trials may be delayed or cancelled.
- 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 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 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.
- 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 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.
- 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.
- 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.
- 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.
- 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.
- We may incur substantial cost in defending our intellectual property.
- 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.
- We may be unable to obtain partnerships for one or more of our product candidates, which could curtail future development and negatively impact our share price. In addition, our partners might not satisfy their contractual responsibilities or devote sufficient resources to our partnership.
- We may be exposed to fluctuations of the US dollar against certain other currencies because we hold most of our cash and cash equivalents in US 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.
- We are subject to extensive government regulation.
- Our share price has been and may continue to be volatile and an investment in our common shares could suffer a decline in value.
- Future sales of our common shares by us or by our existing shareholders could cause our share price to fall.
- We are susceptible to stress in the global economy; therefore, our business may be affected by the current and future global financial condition.
- There is no assurance that an active trading market in our common shares will be sustained.
- It may be difficult for non-Canadian investors to obtain and enforce judgments against us because of our Canadian incorporation and presence.
- We are likely a “passive foreign investment company” which may have adverse U.S. federal income tax consequences for U.S. shareholders.
- 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.
- 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.
- As a foreign private issuer, we are not subject to certain United States securities law disclosure requirements that apply to a domestic United States issuer, which may limit the information, which would be publicly available to our shareholders.

## **EVALUATION OF DISCLOSURE CONTROLS AND INTERNAL CONTROLS**

There have been no changes in our internal control over financial reporting that occurred during the three months ended September 30, 2017, that have materially affected or are reasonably likely to materially affect our internal control over financial reporting. As of September 30, 2017, our management has assessed the effectiveness of our internal control over financial reporting using the Committee of Sponsoring Organizations of the Treadway Commission’s 2013 framework, and our disclosure controls and procedures. Based on their evaluation, the Chief Executive Officer and the Chief Financial Officer have concluded that these controls and procedures are effective.

## **UPDATED SHARE INFORMATION**

As at November 14, 2017, we had 26,896,443 common shares issued and outstanding. In addition there were 2,300,093 common shares issuable upon the exercise of outstanding stock options.

## **ADDITIONAL INFORMATION**

Additional information relating to us, including our December 31, 2016 annual report on form 20-F and other disclosure documents, are available on EDGAR at [www.sec.gov/edgar.shtml](http://www.sec.gov/edgar.shtml) and on SEDAR at [www.sedar.com](http://www.sedar.com).