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Aptose Presents New Preclinical Data on CG-806 and APTO-253 at the 2019 AACR Annual Meeting

- *Pan-FLT3/pan-BTK inhibitor CG-806 Demonstrates Significant and Superior Potency Against Primary Cells Across AML Types –*

- *MYC Inhibitor APTO-253 Potently Kills Hematologic Cell Lines; Mechanism of Action Further Defined –*

SAN DIEGO and TORONTO, April 01, 2019 (GLOBE NEWSWIRE) -- Aptose Biosciences Inc. ("Aptose" or the "Company") (NASDAQ: APTO, TSX: APS), a clinical-stage company developing highly differentiated therapeutics targeting the underlying mechanisms of cancer, today announced that new preclinical data for CG-806, its first-in-class, highly potent oral small molecule pan-FLT3/pan-BTK inhibitor, and APTO-253, its MYC inhibitor, are being presented in two separate posters today at the 2019 AACR Annual Meeting in Atlanta, GA.

CG-806 Poster

The poster, ***CG-806, a pan-FLT3 / pan-BTK inhibitor, demonstrates superior potency against cells from IDH-1 mutant and other non-favorable risk groups of AML patients***, explores the activity of CG-806 on primary patient samples with acute myeloid leukemia (AML), in studies that were conducted in collaboration with the Beat AML Initiative. CG-806 demonstrated significant potency across sub-groups of AML cells, including relapsed/refractory AML and those with genetic abnormalities related to poor prognoses in AML patients. CG-806 demonstrated superior potency when compared to other FLT3 inhibitors, including midostaurin, sorafenib, sunitinib, dovitinib, quizartinib, crenolanib and gilteritinib. While patient samples with FLT3-ITD mutations were expected to have greater sensitivity to CG-806, the sensitivity of patient cells with IDH1 R132 mutations was an unexpected finding. In 28-day GLP toxicity and toxicokinetic studies, CG-806 continued to demonstrate a favorable safety profile. The poster also highlights results of combination studies with CG-806 and venetoclax, which demonstrated enhanced killing of primary cancer cells from patients with AML and B-cell cancers.

"With our IND for CG-806 just recently allowed by the FDA, we are eager to begin Phase 1 human clinical trials," said William G. Rice, Ph.D., Chairman, President and Chief Executive Officer. "The Beat AML initiative has allowed us, with our research collaborators at Oregon Health & Science University (OHSU), to test the response of actual patient samples (*ex vivo*) to CG-806, alone and in combination, and enables us to assess its effectiveness based upon specific genetic profiles of patients. The wealth of CG-806 data continues to grow and strongly supports the clinical development of CG-806. It is our goal to improve the odds of achieving long-term disease remissions for patients."

APTO-253 Poster

The poster, *Resistance to APTO-253 caused by internal deletion and alternate promoter usage of the MYC gene in Raji B cells*, presents *in vitro* studies that further define the mechanism of action of APTO-253. A novel small molecule, APTO-253 inhibits expression of the MYC oncogene, leading to apoptosis in human-derived solid tumor and hematologic cancer cells without the myelosuppression seen with other chemotherapies. 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 chronic lymphocytic leukemia (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.

Both of the AACR posters can be accessedhere or at the publications and presentations section of Aptose's website www.aptose.com.

About CG-806

CG-806 is an oral, first-in-class pan-FLT3/pan-BTK multi-cluster kinase inhibitor and is in a Phase 1 clinical trial for hematologic malignancies. This small molecule, in-licensed from CrystalGenomics Inc. in Seoul, South Korea, demonstrates potent inhibition of wild type and all mutant forms of FLT3 (including internal tandem duplication, or ITD, and mutations of the receptor tyrosine kinase domain and gatekeeper region), cures animals of acute myeloid leukemia (AML) tumors in the absence of toxicity in murine xenograft models, and represents a potential best-in-class therapeutic for patients with AML. Likewise, CG-806 demonstrates potent, non-covalent inhibition of the wild type and Cys481Ser (C481S) mutant forms of the BTK enzyme, as well as other oncogenic kinase pathways operative in B cell malignancies, suggesting CG-806 may be developed for various B cell malignancy patients (including CLL/SLL, FL, MCL, DLBCL and others) that are resistant/refractory/intolerant to covalent BTK inhibitors. Because CG-806 targets key kinases/pathways operative in malignancies derived from the bone marrow, it is in development for B-cell cancers and AML.

About APTO-253

APTO-253 is a clinical-stage, small molecule, targeted therapeutic agent that inhibits expression of the MYC oncogene, leading to cell cycle arrest and programmed cell death (apoptosis) in human-derived solid tumor and hematologic cancer cells. Indeed, the first AML patient treated with APTO-253 at the lowest dose level demonstrated significant reductions of MYC expression in peripheral blood mononuclear cells after one 28-day cycle of drug therapy. The MYC oncogene is overexpressed in hematologic cancers, including acute myeloid leukemia (AML). Aptose researchers have reported the ability of APTO-253 to induce cell death, or apoptosis, in multiple blood cancer cell lines including AML, as well as in vitro synergy with various classes of conventional approved and investigational therapies

for AML or myelodysplastic syndromes (MDS). New findings reveal that APTO-253 might also serve certain solid tumor patients with BRCA1/2 mutations, but without causing toxicity to the normal bone marrow functions.

About Aptose Biosciences

Aptose Biosciences is a clinical-stage biotechnology company committed to developing personalized therapies addressing unmet medical needs in oncology, with an initial focus on hematology. The company's small molecule cancer therapeutics pipeline includes products designed to provide single agent efficacy and to enhance the efficacy of other anti-cancer therapies and regimens without overlapping toxicities. APTO-253, the only known clinical stage agent that directly targets the MYC oncogene and inhibits its expression, is in a Phase 1b clinical trial for the treatment of patients with relapsed or refractory acute myeloid leukemia (AML) or high risk MDS. CG-806, an oral, first-in-class pan-FLT3/pan-BTK multi-cluster kinase inhibitor being developed to treat AML and certain B cell malignancies, is in a Phase 1 clinical trial for hematologic malignancies. For further information, please visit www.aptose.com.

Forward Looking Statements

This press release contains forward-looking statements within the meaning of Canadian and U.S. securities laws, including, but not limited to, statements regarding the clinical potential and favorable properties of CG-806 and APTO-253, and statements relating to the Company’s plans, objectives, expectations and intentions and other statements including words such as “continue”, “expect”, “intend”, “will”, “should”, “would”, “may”, “potential” and other similar expressions. Such statements reflect our current views with respect to future events and are subject to risks and uncertainties and are necessarily 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 described in this press release. Such factors could include, among others: our ability to obtain the capital required for research and operations; the inherent risks in early stage drug development including demonstrating efficacy; development time/cost and the regulatory approval process; 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; changing market and economic conditions; inability of new manufacturers to produce acceptable batches of GMP in sufficient quantities; unexpected manufacturing defects; and other risks detailed from time-to-time in our ongoing quarterly filings, annual information forms, annual reports and annual filings with Canadian securities regulators and the United States Securities and Exchange Commission.

Should one or more of these risks or uncertainties materialize, or should the assumptions set out in the section entitled "Risk Factors" in our filings with Canadian securities regulators and the United States Securities and Exchange Commission 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 press release 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.

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