May 14, 2020

Oncolytics Biotech® Announces Publication of Abstracts at the 2020 American Society of Clinical Oncology Virtual Annual Meeting

Clinical response was associated with tumor-specific replication, PD-L1 upregulation, and CD8+ cell recruitment in multiple myeloma patients treated with pelareorep and carfilzomib

Pelareorep and pembrolizumab combination therapy was well tolerated with encouraging clinical results in second-line pancreatic cancer

SAN DIEGO and CALGARY, Alberta, May 14, 2020 /PRNewswire/ -- Oncolytics Biotech® Inc. (NASDAQ: ONCY) (TSX: ONC), currently developing pelareorep, an intravenously delivered immuno-oncolytic virus, today announced the publication of two abstracts in connection with the upcoming ASCO Virtual Annual Meeting on May 29-31. The first abstract ("Multiple Myeloma Abstract"), which has been accepted as an electronic poster, reports on viral replication, tumor immune responses, and treatment safety in multiple myeloma patients treated with pelareorep in combination with carfilzomib (Kyprolis®). The second abstract ("Pancreatic Cancer Abstract") reports on treatment tolerability and efficacy in pancreatic cancer patients treated with pelareorep, in combination with pembrolizumab (Keytruda®).

Multiple Myeloma Abstract
Abstract ID: 8535
Session: Hematologic Malignancies-Plasma Cell Dyscrasia
Poster ID: 435
Abstract Title: Oncolytic virus pelareorep plus carfilzomib phase I trial in carfilzomib-refractory patients (NCI 9603): Responses with cytokine storm

Presenter: Craig Hofmeister, M.D., MPH, Associate Professor, Department of Hematology and Medical Oncology Emory University School of Medicine

- Reported selective infection of cancerous cells with pelareorep, with associated CD8+ and natural killer (NK) cell recruitment, PD-L1 upregulation, activated caspase-3 expression, and increased pelareorep protein production within myeloma cells.
- Two patients achieved unconfirmed partial responses, two patients had stable disease, and two patients had progressive disease. All patients had advanced and challenging to treat carfilzomib-refractory disease.
- Of the two responding patients, one patient developed a fever and grade 4 thrombocytopenia that resolved, and the other patient developed a cytokine storm, associated with rapid tumor lysis.
- Data supports the potential of future studies investigating pelareorep, carfilzomib, and immune checkpoint inhibitor combination therapy in multiple myeloma patients.
- Additional data to be presented at the poster session on May 29, 2020.

Pancreatic Cancer Abstract
Abstract ID: e16789
Abstract Title: Pembrolizumab in combination with the oncolytic virus pelareorep in patients progressing on systemic chemotherapy for advanced pancreatic adenocarcinoma, a Phase II study
Presenter: Devalingam Mahalingam, MD, Ph.D., Associate Professor of Medicine at Northwestern University Feinberg School of Medicine and a member of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University

- Preliminary data indicate that the combination of pelareorep and pembrolizumab resulted in tumor-specific replication, a high degree of T cell repertoire turnover, and the creation of new T cell clones in the peripheral blood during treatment.
- The treatment was found to be well tolerated, with most treatment-related adverse events being grade 1 or 2.
- One patient achieved a partial response and three achieved stable disease, with an overall disease control rate of 30% in evaluable patients.
- The study will not proceed to stage 2 in unselected patients, however further evaluation of the anti-tumor activity of pelareorep and anti-PD-1 therapy is now planned in biomarker defined pancreatic patients in a subsequent study.
- Detailed translational and biomarker data from this study will be published later in the year.

About Pelareorep

Pelareorep is a non-pathogenic, proprietary isolate of the unmodified reovirus: a first-in-class intravenously delivered immuno-oncolytic virus for the treatment of solid tumors and hematological malignancies. The compound induces selective tumor lysis and promotes an inflamed tumor phenotype through innate and adaptive immune responses to treat a variety of cancers and has been demonstrated to be able to escape neutralizing antibodies found in patients.

About Oncolytics Biotech Inc.

Oncolytics is a biotechnology company developing pelareorep, an intravenously delivered

immuno-oncolytic virus. The compound induces selective tumor lysis and promotes an inflamed tumor phenotype -- turning "cold" tumors "hot" -- through innate and adaptive immune responses to treat a variety of cancers.

Pelareorep has demonstrated synergies with immune checkpoint inhibitors and may also be synergistic with other approved immuno-oncology agents. Oncolytics is currently conducting and planning additional studies in combination with checkpoint inhibitors and targeted therapies in solid and hematological malignancies, as it prepares for a phase 3 registration study in metastatic breast cancer. For further information, please visit: www.oncolyticsbiotech.com.

This press release contains forward-looking statements, within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended and forward-looking information under applicable Canadian securities laws (such forward-looking statements and forward-looking information are collectively referred to herein as "forward-looking statements"). Forward-looking statements, including the Company's belief as to the potential and mode of action of pelareorep as a cancer therapeutic, and other statements related to anticipated developments in the Company's business and technologies involve known and unknown risks and uncertainties, which could cause the Company's actual results to differ materially from those in the forward-looking statements. Such risks and uncertainties include, among others, the availability of funds and resources to pursue research and development projects, the efficacy of pelareorep as a cancer treatment, the success and timely completion of clinical studies and trials, the Company's ability to successfully commercialize pelareorep, uncertainties related to the research and development of pharmaceuticals, uncertainties related to the regulatory process and general changes to the economic environment. In particular, we may be impacted by business interruptions resulting from COVID-19 coronavirus, including operating, manufacturing supply chain, clinical trial and project development delays and disruptions, labour shortages, travel and shipping disruption and shutdowns (including as a result of government regulation and prevention measures). It is unknown whether and how the Company may be affected if the COVID-19 pandemic persists for an extended period of time. We may incur expenses or delays relating to such events outside of our control, which could have a material adverse impact on our business, operating results and financial condition. Investors should consult the Company's quarterly and annual filings with the Canadian and U.S. securities commissions for additional information on risks and uncertainties relating to the forward-looking statements. Investors are cautioned against placing undue reliance on forward-looking statements. The Company does not undertake to update these forward-looking statements, except as required by applicable laws.

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