Forward Looking Statements

This presentation contains certain forward looking statements relating to the company’s financial results, business prospects and the development and commercialization of REOLYSIN®, a therapeutic reovirus. These statements are based on management’s current expectations and beliefs and are subject to a number of factors which involve known and unknown risks, delays, uncertainties and other factors not under the company’s control which may cause actual results, performance or achievements of the company to be materially different from the results, performance or other expectations implied by these forward looking statements.

In any forward looking statement in which Oncolytics Biotech® Inc. expresses an expectation or belief as to future results, such expectations or beliefs are expressed in good faith and are believed to have a reasonable basis, but there can be no assurance that the statement or expectation or belief will be achieved. These factors include results of current or pending clinical trials, risks associated with intellectual property protection, financial projections, market projections, actions by the FDA/HPB/MHRA and those other factors detailed in the company’s filings with SEDAR and the Securities and Exchange Commission. Oncolytics does not undertake an obligation to update the forward looking statements, except as required by applicable laws.
REOLYSIN®: Background
Oncolytics Biotech Inc.

- The Company is focused on the development of an oncolytic virus for use as a cancer therapeutic
- The Company’s product, REOLYSIN®, is a proprietary isolate of reovirus type 3 Dearing, currently being investigated in many randomised clinical studies across a variety of cancer indications
- USAN: pelareorep
Reovirus Replication

- Fully replication-competent
- Mammalian permissive which allows effective modeling in murine, canine, and non-human primate models
- Viral replication is exclusively cytoplastic

*Kras mutated colorectal cancer cell line infected with reovirus. Picture courtesy of Dr. Scott Wadler.*
REOLYSIN® Mechanism of Action

REOLYSIN® infects both tumor cells and normal healthy cells.

REOLYSIN® does not replicate in cells that are not Ras activated.

Healthy cells remain undamaged.

Administered to patients prescreened for RAS, EGFR, BRAF and others.

REOLYSIN® infects both tumor cells and normal healthy cells.

REOLYSIN® replicates in Ras-activated tumor cells.

Tumor cells rupture to release progeny virus.

Progeny viruses repeat cell infection cycle in nearby tumor cells.

Productively infected cells upregulate interferon, and others and induce an anti-tumor specific immune response mediated by NK and T cells.
REOLYSIN®: Clinical Development

- Phase I studies were conducted in various tumour types without reaching an MTD; highest total weekly dose reached was $1.5 \times 10^{11}$ TCID$_{50}$ IV
- Synergistic with cytotoxic compounds or radiotherapy (RT), both of which promote delivery to the interior of a tumor, viral protein translation, and apoptosis of tumor cells
- Objective responses are seen in tumors with known Ras pathway activation
- Safety profile:
  - Minimal hematological or liver toxicity
  - Characteristic flu-like symptoms
  - Administered on an outpatient basis
  - BSL2 with no major precautions

Picture courtesy of Drs. Mahalingham and Nuovo (REO 017 study of Gemcitabine and REOLYSIN® in pancreatic cancer with known KRAS mutation)
# Randomized Clinical Trial Program for REOLYSIN®: Active Studies

<table>
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<th>Phase</th>
<th>Sponsor</th>
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REOLYSIN®, PD-1 and PD-L1
REOLYSIN®, PD-1 and PD-L1

- REOLYSIN® induces the up-regulation of PD-1 and PD-L1 in target tissues
- PD-L1 and PD-1 overexpression is strongly associated with productive reoviral infection
REO 013b is an open-label, single arm, translational clinical study of REOLYSIN® as single IV infusion to nine patients with high grade glioma or metastatic brain tumours prior to planned surgical resection of the target tumours.

REOLYSIN® for the Treatment of Brain Tumors
## Presence of Reoviral Protein, PD-1, and PD-1 (REO 013b Study)

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REOLYSIN® Increases PD-L1 Expression

- Glioblastomas treated with REOLYSIN®: productive reoviral infection showed increases in PD-L1 expression (brown is +)

GBM Treated with REOLYSIN®

Control GBM (Untreated)

Courtesy of Dr. Gerard Nuovo of the OSU Comprehensive Cancer Center and Phylogeny, Inc.
REOLYSIN® Increases PD-1 Expression

- Glioblastomas treated with REOLYSIN®: productive reoviral infection showed increases in PD-1 expression (brown is +)

GBM Treated with REOLYSIN®

GBM Treated with REOLYSIN®, But No Productive Infection

Courtesy of Dr. Gerard Nuovo of the OSU Comprehensive Cancer Center and Phylogeny, Inc.
REO 017: Gemcitabine and REOLYSIN® Induced PD-L1 Expression (25 cycles)

Baseline | Reolysin + Gem
---|---

PD-L1

Pancreatic Cancer Patient

Courtesy of Dr. Steffan T. Nawrocki, Department of Medicine, CRTC at University of Texas Health Science Center at San Antonio
Reovirus and the PD-L1 blockade

- Reovirus upregulates PD-L1 on the surface of breast, kidney and lung cell lines.
- The combination of reovirus and sunitinib further enhances the expression of PD-L1 in breast and lung cancer cell lines.
- This combination increases cell killing in breast and lung cancer cell lines.

Mostafa et al. 2014: Don Morris group, University of Calgary (AACR Tumor Immunology Conference poster)
The combination of intratumoural REOLYSIN® with an anti-PD-1 Ab results in prolonged survival of mice with melanoma.

Rajani et al. 2014: Richard Vile group (Conference poster)
REOLYSIN® and Anti-PD-1 Combination Therapy

- The combination of REOLYSIN® with an anti-PD-1 Ab augments tumor-specific NK responses and attenuates tumor-specific immunosuppression, resulting in significant survival benefits in C57BL/6 mice with established SC B16 tumors (melanoma).

Rajani et al. 2014: Richard Vile group (Conference poster)
REO 013b: Co-Expression of NK Cells and Productive Reoviral Infection

- Reoviral protein expression is seen in same areas as NK cells in brain metastases from colorectal cancer.

*red = reovirus protein; brown = cKIT
red = reovirus protein; green = cKIT; blue = hematoxylin

Courtesy of Dr. Gerard Nuovo, OSU Comprehensive Cancer Center and Phylogeny, Inc.
REOLYSIN® and Immune Checkpoint Inhibitors: rationale for combination therapy

Giovanni Selvaggi, MD
VP Clinical Development

March 25th, 2015