This presentation contains certain forward looking statements relating to the company’s business prospects and the development and commercialization of pelareorep a first-in-class systemically administered immuno-oncology agent for solid tumors and heme malignancies. 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, 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.
Corporate & Clinical Progress

Supports progress into registration pathway for mBC and expansion of I-O & IMiD combinations

<table>
<thead>
<tr>
<th>Nearly doubled overall survival (OS) in HR+/HER2- breast cancer patients</th>
<th>Studies with Merck &amp; Celgene</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPA agreement, Granted Fast Track Designation &amp; positive feedback from FDA and EMA</td>
<td>o Two Combo’s with Keytruda in MM and pancreatic cancer</td>
</tr>
<tr>
<td></td>
<td>o MM combo with Revlimid® or Imnovid®</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I-O Data</th>
<th>Growing interest in oncolytic viruses</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Demonstrated upregulation of PD-L1</td>
<td>Merck-Viralytics / BMS-PsiOxus / Jansen-Benevir</td>
</tr>
<tr>
<td>o Positive Keytruda combo</td>
<td></td>
</tr>
<tr>
<td>o Potential CI and CAR-T synergies</td>
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</table>

<table>
<thead>
<tr>
<th>Partnership with Adlai Nortye</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>o Licensing fee and milestones for mBC of $21.2M</td>
<td></td>
</tr>
<tr>
<td>o Additional milestone payments of $65.4M</td>
<td></td>
</tr>
<tr>
<td>o Double digit royalty</td>
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</tbody>
</table>
What is pelareorep?

- Non-pathogenic proprietary isolate of the unmodified reovirus
- An unarmed intravenously (IV) delivered RNA oncolytic virus
- First IV delivered immuno-oncolytic virus to demonstrate overall survival benefit in a randomized study
## Pelareorep Advantages

<table>
<thead>
<tr>
<th>DNA</th>
<th>VS</th>
<th>RNA pelareorep</th>
</tr>
</thead>
</table>
| IT Delivery | • Specialized delivery  
• Variable dose  
• Assured delivery to tumor |
| IV Delivery | • Ease of delivery  
• Standard dose  
• Accesses metastatic disease |
| Armed Virus | • Specialized delivery and customized handling  
• Biosafety Level 3 |
| Unarmed Virus | • No change to standard practice  
• Biosafety Level 2 |
Pelareorep MOA

Synergy with chemotherapies & immunotherapies by promoting:

- Viral replication
- Activating T cells, NK cells and dendritic cells
- Recruiting tumor infiltrating lymphocytes

More than 40 supporting publications
Pelareorep and Safety

- 1,100+ patients treated, 900+ intravenously
- No maximum tolerated dose (MTD) reached to date
- Biosafety Level 2

Monotherapy Toxicity Symptoms

- Toxicities have generally been mild (grade 1 or 2) and included chills, fever, headache, cough, myalgia, runny nose, sore throat, fatigue, lymphopenia or neutropenia
- Transient toxicities (grade 3 or 4) also included lymphopenia or neutropenia

Symptoms frequently observed from day 2 of treatment and usually lasted < 6 hours
Clinical Development Plan & Clinical Data
Clinical Development Plan

Addresses drug combinations that can potentially boost each response of the MOA

• **Chemo combinations**
  Chemotherapy assists the escape of the virus from the vasculature and enhances the distribution of the virus in the tumor. The basis for our mBC registration pathway.

• **Immunotherapy combinations**
  Pelareorep creates an inflamed phenotype highlighting synergies with both immune checkpoint inhibitors (PD-1/PD-L1) and CAR-T cell therapies. Exploring Window of Opportunity and phase 1/2 collaborations.

• **Targeted/IMiD combinations**
  Pelareorep upregulates NK (natural killer cells). Currently in a combination study with Celgene’s Imnovid® & Revlimid® targeting myeloma and exploring additional collaborations, including combinations with CDK 4/6 and PARP inhibitors.
Chemotherapy Combinations

Metastatic Breast Cancer (2nd, 3rd & 4th Line)

Regulatory Status & Key Learnings

- Statistically significant phase 2 OS data
- Regulatory Feedback:
  - Favorable FDA End-of-Phase 2 (EOP2) Meeting
  - Favorable EMA Final Advice Letter (FAL)
  - Special Protocol Assessment Agreement
  - Fast Track Designation
- Preparing for 450-patient adaptive design registration study with OS endpoint
- **Demonstrated to work as I-O therapy**
Chemo-Combo / Breast Cancer

(IND-213) Phase 2 Design

- Randomized, non-blinded study, with IV administered pelareorep given in combination with paclitaxel versus paclitaxel alone
- Patients with advanced or metastatic breast cancer
- Paclitaxel weekly, on days 1, 8 and 15 of a 28-day cycle and test arm with the addition of pelareorep on days 1, 2, 8, 9, 15 and 16
- 74 patients; powered to 90%
- Endpoints:
  - Primary: PFS
  - Secondary: OS
  - Secondary: ORR
  - Secondary: Safety

(IND-213) Phase 2 Data

- Statistically significant improvement in median OS:
  - 10.4 months to 17.4 months (ITT)
    - HR = .65
    - P = 0.1 (powered to 90%)
  - 10.8 months to 21.0 months (HR+/HER2-)
    - HR = .6
    - P = 0.1 (powered to 90%)
- First IOV to demonstrate a statistically significant median OS advantage in a randomized clinical study
- ORR and PFS similar in both groups
IND-213 randomized phase 2 study from CCTG
Statistically significant improvement in overall survival

ITT Population

Test Arm (paclitaxel/pelareorep) 17.35 months
Control Arm (paclitaxel) 10.35 months

Test n=36
Control n=38
HR+/HER2- ~80%
TNBC ~18%
Prior Chemo 100%
Prior Anthrac. ~90%
Prior Taxanes ~50%
HR (hazard ratio) 0.65
CI (confidence int.) 80% (0.46-0.91)
p-value 0.1 (90% power)

Bernstein V et.al. Abstract CT131, AACR 2017
Chemo-Combo / Breast Cancer

Nearly doubled OS in HR+/HER2-
More than doubled OS in ER+/PR+/HER2-

Overall survival for 57 patients in IND-213 breast cancer study with ER+/HER2- status

HR = 0.60
p = 0.1 (powered to 90%)
Median OS = 10.8 mths vs 21.0 mths
Test = 28
Control = 29

Test Arm (paclitaxel/pelareorep)
Control Arm (paclitaxel)

Overall survival for 47 patients in IND-213 breast cancer study with PgR+/HER2- status

HR = 0.36
p = 0.003
Median OS = 10.8 mths vs 21.8 mths
Test = 26
Control = 21

CCTG: Canadian Cancer Trials Group
Chemo-Combo / Breast Cancer

3,560,570
breast cancer prevalence,
US 2016

2,599,216
Patients with HR+/HER2-subtype

154,885
Patients with HR+/HER2-stage IV breast cancer

154,885
addressable patients in North America

Most common cancer in women globally

Nearly 1.7 million new cases diagnosed globally every year

Source: SEER database & WCRF
## Chemo-Combo / Breast Cancer

### Why 2L and 3L HR+/HER2- is a significant unmet need

<table>
<thead>
<tr>
<th>New agents are all approved as adjuvants or in 1L setting</th>
<th>Checkpoint inhibitors have failed</th>
<th>No other meaningful OS advantage in 2L and 3L</th>
</tr>
</thead>
</table>
| KISQALI® | IBRANCE® | FASLODEX® | VERZENIO® | I-O activity focused on TNBC due to inflamed tumor type | TNBC is most active component of ongoing clinical studies in breast cancer | Only Halaven has shown an OS advantage (2.5 months) | Only PFS options in 2L & 3L:  
  * Taxotere  
  * Taxol  
  * Abraxane  
  * Gemzar |
Immunotherapy Combinations

Current checkpoint inhibitors

Case 4 pretreatment*

Keytruda®
Bavencio®
Opdivo®
Imfinzi®
Tecentriq®
Yervoy®

~20% of cancers

Potential when COLD tumors turn HOT

Case 4 one week after reovirus + Kyprolis*

7-8 days

??% of cancers

• NCI-9603 (Clinical Trial #NCT 02101944), Dr. Craig Hofmeister
Immunotherapy Combinations

Metastatic Pancreatic Cancer (2\textsuperscript{nd} Line)

- **REO 024 Keytruda\textsuperscript{®} Combo**
  - Two patients with SD: 126 and 277 day
  - One patient with PR lasting 504 days (35 cycles)
  - On treatment biopsy: infection in cancer cells and immune infiltrates

- **Pelareorep/Keytruda combination**
  - Primary Endpoint: ORR by iRECIST
  - Secondary Endpoints:
    - Blood-based immune biomarker data
    - PFS and mOS

Additional I-O combinations being reviewed
Multiple Myeloma

- **Pelareorep/Keytruda combination**
  - Primary Endpoint: ORR by iRECIST
  - Secondary Endpoints:
    - Blood-based immune biomarker data
    - PFS and mOS

Additional I-O combinations being reviewed
Targeted/IMiD Combinations

Pelareorep + Imnovid® or Revlimid® in multiple myeloma

Ongoing collaboration with Celgene & Myeloma UK

Establish safety profile

- Rescue treatment in relapsing myeloma patients
- Phase 1b enrolling 44 patients
- Preliminary data expected mid-2019

Additional targeted/IMiD studies currently being reviewed
Clinical Pipeline

<table>
<thead>
<tr>
<th>Collaboration</th>
<th>USC-Merck: Pembro + pelareorep Multiple Myeloma</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOLTI: Window of Opportunity: mBC Subtypes</td>
<td></td>
</tr>
<tr>
<td>NWU-Merck: Pembro + pelareorep 2L Pancreatic</td>
<td></td>
</tr>
<tr>
<td>Celgene-MUK: pom/len + pelareorep in RR Myeloma</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Preclinical</th>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
</tr>
</thead>
<tbody>
<tr>
<td>REO 026: Paclitaxel ± pelareorep 2/3L mBC</td>
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</tr>
</tbody>
</table>

Chemo Combos  | Immuno Therapy Combos  | Targeted / IMiD Combos | Cell Page 20
Manufacturing & Intellectual Property
Established Manufacturing Capability

- Final formulation produced at 100 liter-scale under cGMP
- > 50,000 standard doses per production run
- Commercial scale manufacturing agreement with SAFC (part of Merck Millipore Sigma)
- When stored frozen, liquid formulation is stable for at least five years (stability testing ongoing)
- Biosafety Level 2 classification requiring no specialized handling requirements
- Cost of Goods (COGS) are in line with those of other products made via vaccine manufacturing process
Strong Patent Portfolio

- More than **396 patents** issued worldwide, including **49 US** and **21 Canadian**

- Over **29 pending applications** worldwide

- Reovirus issued patent claims cover:
  - Compositions of matter comprising reovirus
    - Through 2028 and extendable to 2033
  - Pharmaceutical use of reoviruses to treat neoplasia and cellular proliferative diseases
  - Combination therapy with radiation, chemotherapy and/or immunosuppressants
  - Methods for manufacturing reovirus and screening for susceptibility to reovirus
  - Pharmaceutical use of reoviruses in transplantation procedures

As of June 30, 2018
Corporate
Adlai Nortye: USD $86.6 Million Regional License

Regional license covers China, Hong Kong, Macau, Singapore, South Korea and Taiwan

- Upfront, licensing fee and milestone payments to support phase 3 registration study of USD $21.2 million
  - Upfront payment of USD $5.3 million
  - Two milestone payments totaling USD $8 million made up of two callable common share purchase warrants priced at a premium
  - USD $7.9 million based on certain regulatory advancements
- USD $65.4 million upon achievement of clinical, regulatory and commercialization milestones
- Double digit royalty payments
# Experienced Leadership

**Extensive knowledge of oncology/immunotherapy** | **Public company experience**
--- | ---
**Strong business development and commercialization expertise**

## MANAGEMENT
- **Matt Coffey, PhD, MBA**  
  Co-founder, Director, President & CEO
- **Kirk Look, CA**  
  Chief Financial Officer  
  EY LLP
- **Andrew de Guttadauro**  
  Global Head of Business Development  
  Amgen, Biogen, Takeda
- **Allison Hagerman, PEng, PMP**  
  VP of Product Development  
  Visionary Biomedical
- **Michael Moore**  
  VP of IR & Corporate Communications  
  Equicom, Atkins + Associates

## NON-EXECUTIVE DIRECTORS
- **Wayne Pisano, MBA**  
  Chair of the Board, Oncolytics  
  Former President, Sanofi Pasteur
- **Angela Holtham, MBA, ICD.D**  
  Nabisco  
  Hospital for Sick Children
- **J. Mark Lievonen, CA**  
  Former President, Sanofi Pasteur  
  Ontario Institute for Cancer Research
- **William G. Rice, PhD**  
  President & CEO, Aptose Biosciences  
  President, CEO & Director of Achillion
- **Bernd R. Seizinger, MD, PhD**  
  Former President & CEO of GPC Biotech  
  VP of Oncology Drug Discovery, BMS
- **Deborah M. Brown, BSc, MBA**  
  Former President, EMD Serono Canada  
  CCTG

## SCIENTIFIC ADVISORY BOARD
- **Dr. Martine Piccart, MD, PhD**  
  Professor of Oncology, Université Libre de Bruxelles  
  BCRF Scientific Advisory Board  
  Co-Founder of Breast international Group (BIG)
- **Dr. Aleix Prat, MD, PhD**  
  Head, Medical Oncology Department, Hospital Clinic of Barcelona  
  SOLTI - Breast Cancer Research Group
- **Dr. Padmanee Sharma, MD, PhD**  
  Professor, Department of Genitourinary Medical Oncology  
  MD Anderson Cancer Center  
  KITE, Amgen & BMS IO Network
<table>
<thead>
<tr>
<th>Market and Capital Data</th>
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<tbody>
<tr>
<td><strong>Exchanges</strong></td>
</tr>
<tr>
<td>Nasdaq: ONCY</td>
</tr>
<tr>
<td>TSX: ONC</td>
</tr>
<tr>
<td><strong>Market Cap (August 2, 2018)</strong></td>
</tr>
<tr>
<td>USD $80.3 M</td>
</tr>
<tr>
<td>CDN $103.3M</td>
</tr>
<tr>
<td><strong>Shares Outstanding (August 2, 2018)</strong></td>
</tr>
<tr>
<td>16,531,956</td>
</tr>
<tr>
<td><strong>Warrants (August 2, 2018)</strong></td>
</tr>
<tr>
<td>1,730,894</td>
</tr>
<tr>
<td><strong>Options (August 2, 2018)</strong></td>
</tr>
<tr>
<td>892,731</td>
</tr>
<tr>
<td><strong>Restricted/performance share units (August 2, 2018)</strong></td>
</tr>
<tr>
<td>260,349</td>
</tr>
<tr>
<td><strong>Fully Diluted (August 2, 2018)</strong></td>
</tr>
<tr>
<td>19,415,930</td>
</tr>
<tr>
<td><strong>Cash / Cash Equivalents / (June 30, 2018)</strong></td>
</tr>
<tr>
<td>CDN $18.7 million (USD $14.4 million*)</td>
</tr>
<tr>
<td><strong>Financial runway</strong></td>
</tr>
<tr>
<td>End of 2019</td>
</tr>
</tbody>
</table>

* Based on FX on August 2, 2018
# Achieved & Anticipated Milestones

<table>
<thead>
<tr>
<th>Event</th>
<th>Timing</th>
</tr>
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<tbody>
<tr>
<td>Almost doubled OS in HR+/HER2- mBC patients</td>
<td>✓</td>
</tr>
<tr>
<td>FDA: Special Protocol Assessment &amp; Fast Track Designation</td>
<td>✓</td>
</tr>
<tr>
<td>Listed on Nasdaq</td>
<td>✓</td>
</tr>
<tr>
<td>Corporate Update <em>(phase 3, partnering and clinical programs)</em></td>
<td>Q3 2018</td>
</tr>
<tr>
<td>Initiate phase 2 Window of Opportunity Study in mBC</td>
<td>2H 2018</td>
</tr>
<tr>
<td>Initiate phase 2 NWU-Merck study in pancreatic cancer</td>
<td>2H 2018</td>
</tr>
<tr>
<td>Initiate phase 1b USC-Merck study in multiple myeloma</td>
<td>2H 2018</td>
</tr>
<tr>
<td>Data from Window of Opportunity (WOO) Study in mBC</td>
<td>1H 2019</td>
</tr>
<tr>
<td>Preliminary Data from MUK eleven study in multiple myeloma</td>
<td>Mid-2019*</td>
</tr>
<tr>
<td>Data from USC-Merck study in multiple myeloma</td>
<td>2H 2019*</td>
</tr>
<tr>
<td>Preliminary data from NWU-Merck study in pancreatic cancer</td>
<td>1H 2020*</td>
</tr>
</tbody>
</table>

* Guidance provided by principal investigators
Compelling Opportunity Summary

Registration pathway:
- Almost doubled OS in HR+/HER2- mBC patients
- Favorable FDA & EMA feedback
- SPA agreement

Synergies with Immunotherapies
- Increases NK & T-Cells and enhances antigen presentation by APC’s
  - Potential synergy with IMiD’s (MUK-Celgene study) & CDK 4/6
- Increasing expression of PD-1/L1 on tumor T-Cells
  - Potential synergy with I-O’s (presented Keytruda® results)
- Preparing for additional phase 1 and 2 studies
- Investigating additional collaborations with strategic partners

Competitive advantages
- IV administration (systemic)
- Biosafety Level 2 & extensive safety database
- Broad patent portfolio
- Manufacturing
Investor Presentation