BioCanRx
Biotherapeutics for Cancer Treatment
Biothérapies pour le traitement du cancer

Clinical Trials Program

Clinical trial to test the oncolytic vaccine approach in combination with checkpoint inhibitor antibodies

June 1, 2016 to November 30, 2018

Highlights

- World's first clinical trial to combine an oncolytic vaccine approach with checkpoint inhibitor antibodies for cancer treatment
- The oncolytic vaccine strategy using adenovirus and Maraba virus was developed in Canada and its clinical testing remains exclusive to Canada
- Tremendous prospect for multi-sector partnerships at an early stage of testing

Patients: **42**

Trial sites: **5**

Biotherapeutics: **3**

Eligible cancers: **150,400** new cases of these cancers in 2015

Lung, Uterine, Pancreatic, Melanoma, Stomach, Anal, Bladder, Cervical, Prostate, Kidney, Ovarian, Esophageal, Colon, Mouth, Liver, Breast

Project value: **$7.9M**

$750,000 from BioCanRx

$1.2M

$4.2M in kind

$1.7M

OICR Ontario Institute for Cancer Research

Pharmaceutical company (TBC)

TURNSTONE BIOLOGICS • THINK POSSIBLE

Partners: **3**

AdMA3
Adenovirus vaccine/ MAGE-A3

+

MG1MA3
MG1 Maraba/MAGE-A3 oncolytic virus

Anti-PD1 antibody
Immune checkpoint inhibitor

> "The combination of conventional and oncolytic vaccines with checkpoint inhibitor antibody therapy is one of the most exciting prospects in oncology."
>
> *– **Dr. Stephen Russell**, oncologist and researcher at the Mayo Clinic, and member of the BioCanRx Research Management Committee*

About the project

This Phase Ib clinical trial will test a new biotherapeutic combination strategy in patients with advanced solid-tumour cancers that express the tumour antigen MAGE-A3 and have failed to respond to conventional therapies. The study will evaluate the safety, biology and anti-tumour activity of an approach that combines oncolytic virus vaccines with therapeutic antibodies. The oncolytic virus approach uses two viruses that, together, stimulate anti-tumour immune response and provide their own ability to kill cancer cells. Onto this, the trial will layer an antibody therapy in the form of an immune checkpoint inhibitor. These inhibitors target immunological brakes, which normally function to hold the immune system at bay in order to avoid its over-activation against normal cells. These immunological brakes are often co-opted by cancer cells, allowing the cancer to escape detection by the immune system. By using immune checkpoint inhibitors to disrupt this deception, the immune system can properly detect the cancer and do its job to get rid of the disease.

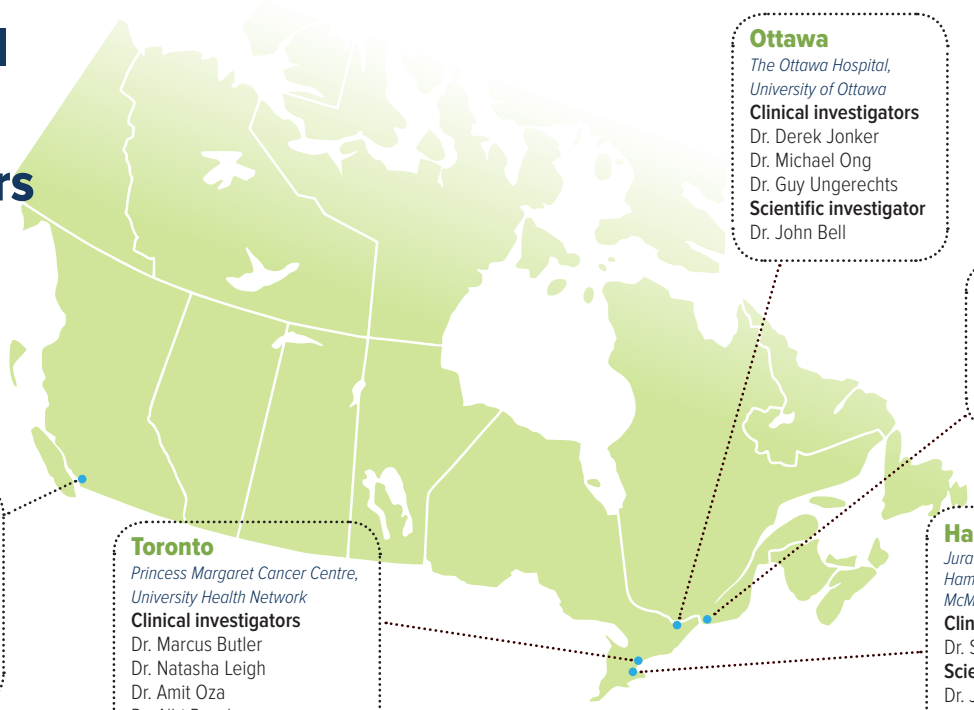
Because only some patients in clinical trials respond to therapeutic antibodies on their own, it's thought that immune checkpoint inhibitors are most effective in patients with an existing anti-cancer immune response. As a result, there is a search for agents that will sensitize cancers to immune checkpoint inhibitors. This trial will explore whether the proposed oncolytic virus vaccine approach will sensitize the cancer in this way, while also delivering its own cancer-killing properties.

Key investigator

Dr. Marcus **Butler**

UHN Princess Margaret Cancer Centre

Clinical trial sites and investigators



Ottawa
The Ottawa Hospital, University of Ottawa
Clinical investigators
Dr. Derek Jonker
Dr. Michael Ong
Dr. Guy Ungerechts
Scientific investigator
Dr. John Bell

Montreal
Jewish General Hospital, McGill University
Clinical investigators
Dr. Gerald Batist
Dr. Wilson Miller

Vancouver
BC Cancer Agency, University of British Columbia
Clinical investigator
Dr. Daniel Renouf
Scientific investigators
Dr. Rob Holt
Dr. Brad Nelson

Toronto
Princess Margaret Cancer Centre, University Health Network
Clinical investigators
Dr. Marcus Butler
Dr. Natasha Leigh
Dr. Amit Oza
Dr. Albi Razak

Hamilton
Juravinski Cancer Centre, Hamilton Health Sciences, McMaster University
Clinical investigator
Dr. Sebastien Hotte
Scientific investigators
Dr. Jonathan Bramson
Dr. Brian Lichty

BioCanRx
$750,000
approved on
June 10, 2015

Partner contributions

Ontario Insitute for Cancer Research
$1.2M to provide patient case funding and patient screening costs

Turnstone Biologics
$1.74M to fund production of clinical, human grade Ad-MAGE-A3 and MG1-MAGE-A3 viral vectors, and immune monitoring costs

Industry partner (to be confirmed)
$4.2M in kind to supply the checkpoint inhibitor, an anti-PD-1 antibody therapy.

Before June 1, 2016
- Generate required clinical and regulatory documents
- Submit Clinical Trial Application to Health Canada
- Establish contracts with sites and other contract research organizations, and obtain REB approvals
- Vial existing lot of the oncolytic vaccine MG1MA3
- Manufacture and release a second lot of the oncolytic vaccine MG1MA3

June 1, 2016
- Trial opens

June 1 to Nov. 30, 2016
- Enrol and treat patients 1 to 6 in the initial safety phase of the trial

Dec. 1, 2016 to Nov. 30, 2017
- Enrol and treat patients 7 to 12 in the initial safety phase of the trial
- Complete analysis of the first 12 patients and choose treatment schedule for the Phase 1b part of the trial
- Enrol and treat patients 13 to 42 in the Phase 1b part of the trial

Dec. 1, 2017 to May 31, 2018
- Complete follow-up and evaluation of:
  - primary safety objectives
  - secondary endpoint of response to treatment in the Phase 1b part of the study

June 1 to Nov. 30, 2018
- Continue and complete evaluation of the remaining secondary endpoints, which include: duration of response, antigen-specific T-cell activation, lymphocyte infiltration into tumours and biomarkers that predict tumour response
- Write manuscript

The power to kill cancer lies within us.
Let's tell our bodies how.

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