BioCanRx
Canada's Immunotherapy Network
Le réseau canadien d'immunothérapie

Enabling Studies Program

Developing T cells that target antigens specific to lymphoid cancers

October 1, 2015 to March 31, 2017

Highlights

- This therapeutic approach involves isolating and propagating T cells that can recognize and attack specific antigens in blood cancers
- This is the first time a proteomic approach has been used to discover and validate MiHAs in human lymphoma and chronic lymphocytic leukemia (CLL)
- Success would lead to more consistent, more effective and safer treatment of blood cancers compared to allogeneic transplantation

Biotherapeutics
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MiHA T cells
T cells targeted to minor histocompatibility antigens (MiHAs)

Eligible cancers
10,816
new cases of these cancers in 2015
non-Hodgkin's **lymphoma**
lymphoid hematologic **malignancies**
chronic lymphocytic **leukemia**
3,389
deaths from these cancers in 2015

Project value
$729,875
$299,875
from BioCanRx
$300,000
$20,000
GenomeQuébec
$110,000
in-kind
cure: blood cancer
Hôpital Maisonneuve-Rosemont
Centre affilié à l'Université de Montréal

Partners
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About the project

In Canada, approximately half of the 16,000 people diagnosed with hematologic cancers (HCs) every year develop resistance to chemotherapy and die, representing an estimated 60,000 years of potential life lost.

For these patients, allogeneic hematopoietic cell transplantation (AHCT) is the sole curative treatment. However, there are two major problems with traditional ACHT: it has variable anti-cancer effects and comes with the risk of a devastating complication called graft-versus-host disease (GVHD), in which the donor cells attack the patient.

Research has shown that the curative effects of AHCT result from immune cells that are able to recognize and target the cancer cell's minor histocompatibility antigens (MiHAs), which are small cell-surface proteins that function as signals for cells of the immune system. Preclinical and clinical studies suggest that the injection of T cells primed against a single MiHA can cure HCs without causing any GVHD.

The project team has identified 39 MiHAs expressed by hematopoietic cells using samples from 1,000 patients with hematologic cancers (e.g., non-Hodgkin's lymphoma (NHL) and chronic lymphocytic leukemia (CLL), but not acute leukemias). They want to identify and validate the best candidates for a clinical trial, and develop a protocol for submission the Health Canada.

Using T cells that target specific MiHAs has the potential to transform care for patients with blood cancers.

Key investigators
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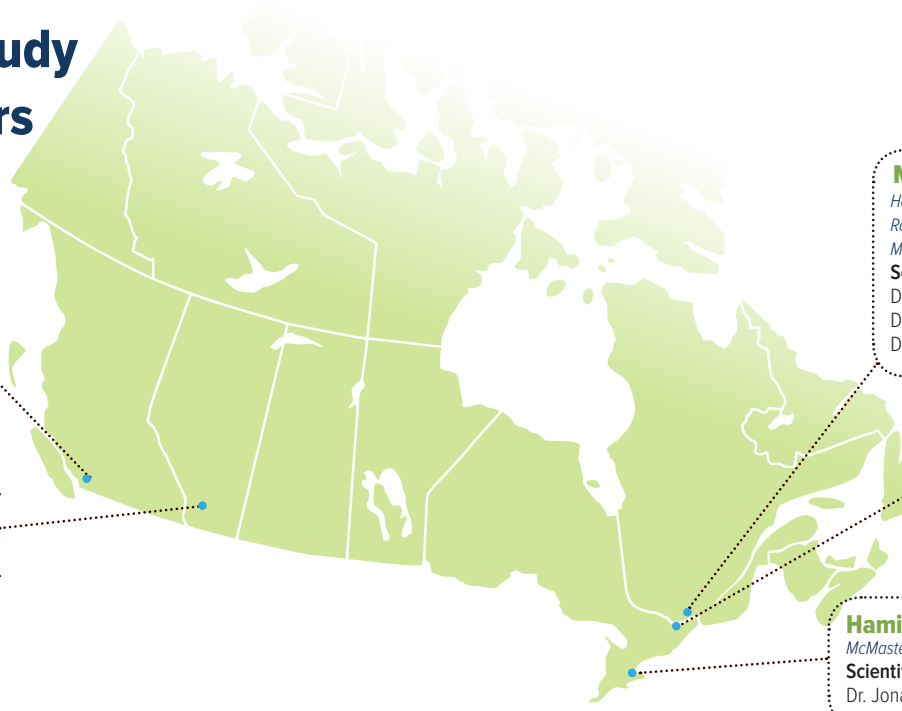
Enabling Study investigators



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BioCanRx
$299,875
approved on
Sept. 29, 2015

Partner contributions

Cure: Blood Cancer
$20,000

Genome Quebec
$300,000

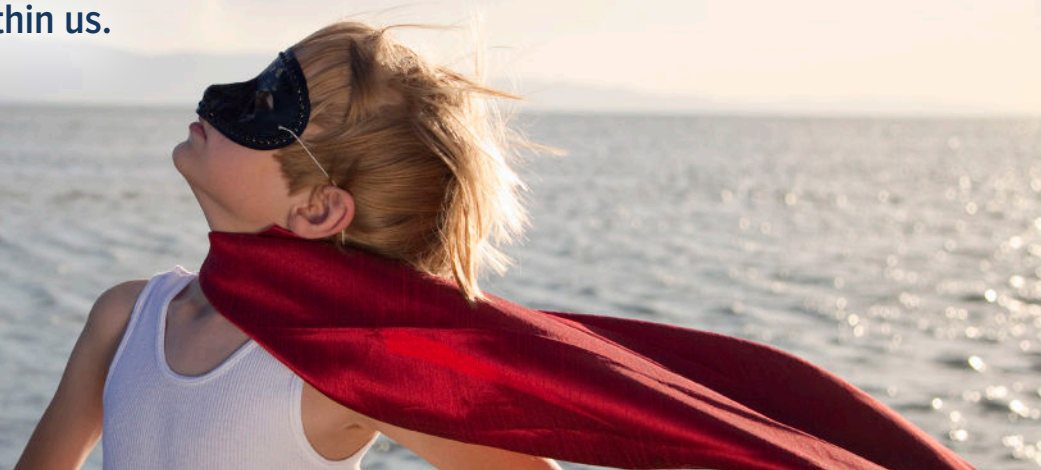
Hôpital Maisonneuve-Rosemount
$110,000

October 1, 2015 to March 31, 2016
- Test shipping conditions with cells collected from donors
- Generate cytotoxic cell lines with anti-MiHA activity (fresh and frozen)
- Identify primary NHL, CLL and peripheral blood mononuclear cell (PBMC) samples

April 1 to September 30, 2016
- Evaluate shipping samples for identity and purity
- Transcriptome analysis of samples (MAP identification and quantification)
- Start development of clinical trial protocol

October 1, 2016 to March 31, 2017
- Measure polyfunctionality of fresh versus frozen initial and final blood products
- Select best MiHA profiles
- Perform dry and wet runs
- Finalize clinical trial protocol
- File Clinical Trial Application

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



BioCanRx
Biotherapeutics for Cancer Treatment
Biothérapies pour le traitement du cancer