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

Enabling Studies Program

Enabling a Phase I Clinical Trial of a Novel Single Domain Mesothelin-Specific Chimeric Antigen Receptor (CAR) T-Cell Therapy for Ovarian Cancer and Other Solid Tumours

Project duration: 2025-3-9 to 2026-3-31

Targeted cancer type:

Solid tumors (ovarian, pancreatic)

This project will support the manufacturing, safety assessments and clinical trial design for an innovative CAR that targets mesothelin (MesoCAR), in order to enable an eventual Phase I clinical trial for solid-tumors.

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BioCanRx Funded Core Facilities

The Ottawa Hospital's Biotherapeutics Manufacturing Centre

BC Cancer's Molecular and Cellular Immunology Core

Project Value:

$1,689,673

BioCanRx Contribution:
$605,000

Biotherapeutic:
Adoptive cell therapy

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Partners

Key Investigators:

Project Lead:
Dr. Brad Nelson
BC Cancer Research
Provincial Health Services Authority

Dr. Jennifer Quizi
The Ottawa Hospital Research Institute | L'Hôpital d'Ottawa Institut de recherche

BC Cancer Foundation
National Research Council Canada | Conseil national de recherches Canada
The Ottawa Hospital Research Institute | L'Hôpital d'Ottawa Institut de recherche
Ovarian Cancer Canada

About the project:

While Chimeric Antigen Receptor (CAR) T cell therapies have been successful in treating certain blood cancers, their application to solid tumours remains challenging. To address this, in close collaboration with the National Research Council, the team has developed a novel CAR that uses an innovative "nanobody" against a protein called mesothelin (Meso), which is frequently overexpressed by ovarian, pancreatic and other solid tumours. The team's lead MesoCAR shows unparalleled efficacy in mouse tumour models, with 100% of mice achieving complete, durable tumour regressions. In collaboration with the Canadian-Led Immunotherapies for Cancer (CLIC) consortium, they are advancing MesoCAR from mouse models to a phase I clinical trial at three Canadian centres. This project will finalize pre-clinical safety assessments of MesoCAR, initiate production of clinical-grade lentivirus and CAR-T cells, and design a clinical trial protocol. By the end of funding, the team will be ready to manufacture clinical-grade lentivirus and finalize CAR-T cell production methods to enable a Clinical Trial Application to Health Canada in 2026. This project has the ambitious goal of "breaking the solid tumour barrier" using an exceptionally promising made-in-Canada CAR-T cell product.

Research:
BC Cancer, Victoria, BC
Dr. Brad Nelson, Dr. Peter Watson,
Dr. Julian Smazynski

BC Cancer, Vancouver, BC
Dr. Kevin Hay, Dr. Robert Holt,
Dr. Hanna Cherniawsky,
Dr. Kevin Song, Dr. Yvette Drew

Cell Manufacturing:
BC Cancer, Victoria, BC
Dr. Julie Nielsen

Research:
Arthur Child Cancer Centre,
Calgary, AB
Dr. Prafall Ghatage

Virus Manufacturing:
The Ottawa Hospital's Biotherapeutics
Manufacturing Centre, Ottawa, ON
Dr. Jennifer Quizi

Research:
Ottawa Hospital Research Institute,
Ottawa, ON
Dr. Natasha Kekre,
Dr. Harry Atkins

National Research Council, Ottawa, ON
Dr. Scott McComb,
Dr. Risini Weeratna

Partners:

BC Cancer Foundation

National Research Council of Canada

The Ottawa Hospital's Biotherapeutics Manufacturing Centre

Ovarian Cancer Canada

Total Pledged Partner Contributions: $1,084,673

Total Pledged Matched Contributions: $846,436

Total Leveraged Partner Contributions: $238,236

Key Deliverables

1. Complete the safety assessment of the lead sdMesoCAR construct
2. Initiate clinical-grade manufacturing of sdMesoCAR plasmids and lentivirus
3. Develop release assays and release criteria for sdMesoCAR-T cells
4. Establish a robust clinical trial protocol for a future CTA submission to Health Canada

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

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