

## An Interventional, Open-label, Non-randomized Dose-escalation Phase I Multicenter Clinical Trial of Multi-peptide Anti-minor Histocompatibility Antigen Immunotherapy for the Prevention of Relapse in Patients with High-risk Malignancy Eligible for Matched Related ASCT

July 1, 2020 - March 31, 2025

### Highlights

- A “first-in-human” clinical trial in relapsing patients has already demonstrated signs of activity without severe toxicity. This trial will facilitate implementation and broaden target patient population.
- New and well-defined MiHAs that are i) expressed mainly/ only on hematopoietic cells, and ii) overexpressed on neoplastic cells, are used to generate an anti-MiHa donor lymphocyte infusion (DLI) with a manufacturing approach that avoids T cell exhaustion, to be administered day+60 post ASCT.
- Companion tests with novel IP have also been developed and implemented under the Centre for Commercialization of Cancer Immunotherapy (C3i).

### Hematologic Cancers

This study uses a novel immunotherapeutic strategy to prevent post-ASCT relapse in patients with high-risk hematologic malignancy.

targeted cancers

Partners  
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Centre intégré universitaire de santé et de services sociaux de l'Est-de-l'Île-de-Montréal

Québec



Regenerative Medicine and Cell Therapy Network

Project value  
\$3.72 M  
BioCanRx contribution:  
\$749,960

Patients enrolled  
9

### About the project

Long-term remissions of hematologic malignancies after allogeneic stem cell transplantation (ASCT) rely largely on the graft-versus-leukemia effect (GVL). In a fully HLA-matched setting, the GVL effect is mediated by T cell immune responses against host minor histocompatibility antigens (MiHAs) found on malignant cells surface. 16-51% of AML patients experience recurrence of their disease within 2 years following AHCT. In patients with high-risk hematologic malignancy the GVL effect appears to be more limited and disease progression is known to be higher than 50%, questioning the benefit of this immunotherapy. Patients with relapsed acute leukemia or myelodysplastic syndrome following AHCT can be treated with their original donor lymphocyte infusions (DLI), but only 10-30% of them achieve remission.

The ability to target MiHAs preferentially expressed on leukemia cells is a promising strategy to prevent post ASCT relapse. In this study, the researchers will use a novel immunotherapeutic strategy by selecting 98 MiHAs preferentially expressed on hematologic cancers cells over other tissues, to generate anti-MiHA T cells line (GLIDE) while minimizing the risk of GVHD.

Ten patients who have already relapsed post ASCT have already been treated with 1-2 infusions of single (n=9) or multi (n=1) anti-MiHA peptide stimulated T cells in a [multicenter phase I study](#). This treatment has demonstrated signs of activity without toxicity. Following this proof of concept, the researchers plan to generate a DLI targeting multiple MiHA peptides to be administered simultaneously day+60 post ASCT in patients with high-risk hematologic malignancies to increase the GVL effect and improve patient long-term outcome.

This application is addressing priority areas of BioCanRx: it is investigating a novel immunotherapeutic strategy for high risk blood cancers, using biologically relevant anti-MiHA cancer targeting DLI, developed with sophisticated genomic and immunologic approaches, incorporating multiplex ex vivo expansion strategy, and assessing its activity (HTA) in a clinical trial setting. Most importantly, it is gathering efforts from major centers across Canada.

Key investigator  
Dr. Denis Claude Roy

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# Project Team Members

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## Partners

HMR-CIUSSS-East-of-Montréal - \$800,000 (in-kind)

C3i: Centre for Commercialization of Cancer Immunotherapy - \$100,000 (in-kind)

CellCAN - \$20,000

Cancer Research Society - 1.5M

## Key Milestones

Perform a multi-center novel anti-MiHA T cell immunotherapy clinical trial across Canada to determine the safety of GLIDE infusion after HLA-matched stem cell transplantation.

Provide preliminary information on the efficacy of multi-peptide anti-MiHA specific DLI in patients with high-risk hematologic malignancy undergoing HLA-matched allogeneic stem cell transplantation.

Determine the dose of GLIDE cells that can be administered safely (MTD) in the context of immunoprophylaxis after allogeneic HLA matched stem cell transplantation.

Determine whether GLIDE graft characteristics have an impact on GVHD and malignant relapse.

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

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