

BACKGROUND

BC led genomics projects contribute to Canada's health innovation and biomanufacturing goals

These four health research projects are designed to strengthen Canada's ability to respond to today's most urgent health challenges — including drug resistance, complex immune diseases, viral infections and barriers to care.

Together, these projects are enhancing how we develop, deliver and scale innovative therapies, while also establishing the policy tools and manufacturing capacity necessary to bring them into use.

Funded by Genome BC, Michael Smith Health Research BC and federal and industry co-funders, the projects will contribute to the work of Canada's Immuno-Engineering and Biomanufacturing Hub (CIEBH) to reinforce national goals in health innovation, policy and domestic biomanufacturing.

This initiative will:

- **Support the development of innovative therapies**, including RNA medicines, cell therapies and microbiota-based treatments.
- **Strengthen Canada's biomanufacturing and delivery systems** for rapid response to emerging health threats.
- **Accelerate the translation of health innovations into clinical use** through policy, regulatory and evidence-generation tools.
- **Contribute to national health goals by building platforms** that are scalable, equitable and ready for real-world application.

Microbiota for Pandemic Interventions and Exploration (MiPEX)

Project Leads: Dr. Carolina Tropini and Dr. Bruce Vallance

Organization: University of British Columbia (UBC)

Objective: This project is investigating how to use beneficial gut bacteria to prevent and treat drug-resistant infections, helping to fight antibiotic resistance and prepare for future pandemics.

Summary: Antimicrobial resistance is a significant public health concern because it can undermine the effectiveness of current treatments and increase the risk of future pandemics. This project is investigating how beneficial bacteria in the human gut can help prevent drug-resistant infections. By leveraging cutting-edge genomics for screening and validating protective microbes, the team aims to develop microbiota-based therapies that could be used for treatment or prevention. The work will also support domestic innovation by building a scalable pathway from discovery to biomanufacturing.

A Pathogen-ready Arsenal of Next-generation lipid nanoparticle (LNP) messenger RNA (mRNA) therapeutics (PAN-RNA)

Project Leads: Dr. Eric Jan and Dr. Sabrina Leslie

Organization: University of British Columbia (UBC)

Objective: This project aims to improve how RNA therapies are designed and tested, accelerating the development of new treatments for disease, like cystic fibrosis.

Summary: RNA-based medicines offer new ways to treat a wide range of diseases, but challenges with stability and testing are slowing their development. This project aims to improve how RNA therapies are developed and will use advanced single-molecule and single-cell imaging tools to evaluate the performance of these revised therapies at the most granular level of resolution. The team aims to reduce trial-and-error in the lab and help bring safe, effective RNA-based treatments to patients faster — including for cystic fibrosis and autoimmune conditions.

Platform for Regulatory Science, Innovation, and Equitable Health Systems (PRISm)

Project Leads: Dean Regier, Deirdre Weymann, Tania Bubela

Organizations: University of British Columbia (UBC)

Objective: PRISm is a platform designed to accelerate the translation of health innovation into patient care. Bringing together scientists from across disciplines, PRISm will produce evidence on safety, value, and equity to guide decisions about commercialization, regulation and reimbursement.

Summary: Even the most promising health innovations can stall when evidence or policy lags behind. PRISm addresses this gap by creating tools and generating evidence that support decision-making, with a focus on patient outcomes, clinical performance, cost-effectiveness, and equity. PRISm also includes training for future experts and partnerships with government and industry to ensure that innovations reach the people who need them — safely, fairly and sustainably.

Designer Cellular Immuno-Engineering for Infectious Disease Elimination (DeCIDE)

Project Leads: Dr. Peter Zandstra and Dr. Megan Levings

Organization: University of British Columbia (UBC)

Objective: This project is creating pre-made, "off-the-shelf" cell therapies to prevent or treat long-term health problems, making this type of treatment more accessible and ready for future outbreaks.

Summary: Cell therapy has shown promise in treating cancer and immune disorders, but its complex and resource-intensive production limits access — especially in urgent or large-scale situations. This project is developing "off-the-shelf" cell therapies that can be



Genomics positively impacts life, every day.

manufactured in advance and used to prevent or treat long-term complications from viral infections or other immune-mediated diseases. By combining cell engineering with scalable production methods, the team aims to make cell therapies more accessible and adaptable — a key step toward preparing for future outbreaks and immune-related health challenges.

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