

# ACCELERATING RESEARCH COMMERCIALIZATION AND IMPACT

Pre-Budget Submission – 2024  
JDRF Canada

## RECOMMENDATION



2024 marks JDRF Canada's 50th anniversary. As such, and as a valued partner with the government, we are recommending that the Government of Canada invest \$50M over 5 years, with up to a \$10M in-kind and cash match from JDRF and partners, in new and existing type 1 diabetes (T1D) research from discovery to clinical trials – aimed at discovering and translating treatments that can be commercialized - building Canada's life sciences sector and creating good jobs for Canadians.

## INTRODUCTION

JDRF's research strategy is focused on investing in fundamental, translational and clinical research to drive productization – getting new therapies or devices into the hands of Canadians living with type 1 diabetes (T1D). For the research we fund to benefit the T1D community, it is crucial that the breakthroughs our funding enables are translated into commercial products. Central to our Global Research Strategy are principles that ensure this translation is supported for high potential projects.

Many of JDRF's research investments have helped move therapies in development beyond the "valley of death," a critical time when discovery research is translated into a therapy or technology but lacks the funding to move it forward. Crossing this "valley" so that a therapy or device will make it into the hands of people with T1D involves vital early-stage clinical trials, a space in which JDRF is a key player.

JDRF's recommendation also aligns with key research opportunities outlined in the National Framework for Diabetes, "[e]nhance investments for innovative diabetes research for all types of diabetes in Canada to support strong investigator-initiated and strategic research," and can provide both the accountability and success metrics required for reporting purposes in 2027 (Public Health Agency of Canada, 2022, p.16).

Similarly, Canada's Biomanufacturing and Life Sciences Strategy can benefit from JDRF's focus on

productization and clinical trials that drive development from lab to commercialization. "These objectives will be supported by upstream federal enabling measures, such as support for clinical trials, training and skills development for the life sciences labor market, modern regulations and commercialization of Canadian innovations" (Innovation, Science, and Economic Development Canada, 2021, p. 8).





## THE IMPORTANCE OF COMMERCIALIZING TYPE 1 DIABETES RESEARCH

An estimated 300,000 Canadians live with T1D, an autoimmune disease where the pancreas cannot produce enough insulin for the body's needs, causing blood sugars to rise. Until a cure is found, people with T1D must monitor their blood glucose throughout the day and take multiple daily insulin injections to survive. But insulin is an imperfect treatment, and Canadians with T1D have a high risk of burdensome complications, lower quality of life, and life expectancy that is 10 years less than the general population. Importantly, T1D is one of only two common autoimmune diseases without at least one disease-modifying therapy on the market (the other is celiac disease).

Cases of T1D in Canada are climbing by 4.3% every year – faster than general population growth of 1.0% per year – and we do not know why (Global T1D Index data, 2023). Health care costs resulting from all diabetes in Canada are estimated to cost over \$30 billion (CAD) annually (Diabetes Canada, 2022). The need is urgent to

develop, test and deliver new therapies to market for patients to reduce disease management burden, and ultimately delay or prevent the onset of disease.

Canada has the talent and capacity to discover the next major breakthroughs in T1D research and drive them to commercialization, as shown by incredible results in this space that are getting us closer to prevention and cures.

But to maintain our leading research position on the global stage and to reduce the immense pressure on our health care system of this chronic condition, we need the proper support and investments for life-science innovations throughout the research process, from bench to patient. It is crucial to provide consistent and stable sources of funding for Canadian researchers to launch the next moonshots that will transform the landscape of T1D therapy.

## ECONOMIC IMPACT LOST BY CANADA WITHOUT SUSTAINED RESEARCH INVESTMENT:

JDRF is currently funding approximately 60 grants in Canada, almost exclusively at academic institutions, and a large proportion of them at the discovery or translational stage. This indicates incredible momentum in Canadian T1D research and a high potential to transform discoveries into new products that can benefit the T1D community. Substantial and sustained investment in Canadian T1D research is crucial to leverage this momentum and potential, and will boost the Canadian economy in multiple ways. First, with JDRF Canada’s recommended investment, we propose to create at least 200 jobs for research staff and highly qualified personnel, and up to 200 positions for students across our planned initiatives. Second, the potential for our research to result in spin-off companies could boost the economy further by creating additional jobs and attracting greater investment into the commercial space. Third, the long-term effects of bringing new solutions to market for T1D will ultimately reduce health care costs by reducing hospitalizations due to T1D-related complications (including diabetic ketoacidosis, hypoglycemia, kidney and cardiovascular disease, and mental health disorders), as well as improve quality of

life and thereby reduce absenteeism and presenteeism related to T1D in working-age adults.

Research projects that are heading down a road of success need sustained funding to ensure they do not disintegrate. Without the right funding, these projects and the research talent behind them may choose to relocate to other countries. This puts Canada in a position of starting research projects with a heavy investment, but then losing out on the economic benefits that would flow from potential breakthroughs. By not creating the right environment for research projects to move through the full pipeline, including commercialization, we are also deterring new investments in Canada that bring additional and needed economic benefits. As noted in the federal government’s Advisory Panel on the Federal Research Support System, to maintain a robust pipeline of new opportunities, increased investment is needed in world-leading research.



Research investments by JDRF Canada have the potential to spin off into companies, creating jobs and stimulating investment. Examples of success stories that demonstrate how JDRF-funded research drives progress through the pipeline towards commercialized therapies with high potential to improve the lives for people with T1D and their caregivers include:

- JDRF provided support to Dr. Richard Liggins and Dr. Mike Riddell, funding discovery-stage research which led to creation of a Canadian biotech company, Zucara Therapeutics. JDRF then provided funding to move Zucara beyond the “valley of death”, from discovery to commercial development. With this support, Zucara was able to advance its drug candidate, ZT-01, to be ready for human testing and secure the backing of a large venture capital fund in April 2020 to move ZT-01 (designed to prevent dangerous hypoglycemic events) into phase 1 clinical trials. JDRF has also made a new \$2M USD investment in the company’s phase 2 clinical trial in June 2023. ZT-01 is on track to become the first therapy on the market to prevent severe hypoglycemic events, which are a common, life-threatening and greatly feared complication of living with insulin-treated diabetes.

**2.** JDRF supported multiple studies, including those of Dr. Timothy Kieffer (UBC), that proved that human stem cells could be differentiated into insulin-producing beta cells, and that the cells could function in encapsulation devices designed for implant under the skin, supporting the launch of first-in-human clinical trials of these approaches in 2015. The first company to test this approach in humans, ViaCyte, was extensively supported by JDRF from 2015 until the company was acquired by Vertex Pharmaceuticals in 2022. Islet replacement therapies being tested by ViaCyte / Vertex today are showing great potential for people living with T1D to stop taking external sources of insulin, bringing the field close to a functional cure for the disease.

**3.** JDRF historically supported the work of Pere Santamaria (University of Calgary) which led to creation of a Canadian spin-off company, Parvus Therapeutics, who in 2024 is set to begin its first clinical trial of a platform technology designed to treat autoimmunity. In a T1D setting, this technology has the potential to delay progression of T1D by minimizing the autoimmune response, preventing complications and lessening the burden of management. Moreover, the technology may be tested in people at risk to prevent disease onset.

## OUR RESEARCH SETS US APART



- Since 1974, JDRF has been **part of nearly every major scientific breakthrough** in T1D research worldwide.
- **We engage people with lived experience** of T1D throughout the research process.
- We collaborate with academia, foundations, industry, government, and other non-profits to extend our reach and impact.
  - Our largest partnership, the JDRF-CIHR Partnership to Defeat Diabetes, has invested a total of \$60 million to T1D research (\$30 million from the federal government and \$30 million from JDRF) since 2017. Over that short period of time, we have jointly funded 20 cutting-edge projects on topics with high translational and practice- or policy-changing potential, including studies aiming to develop novel immune therapies or stem cell-based cures for T1D; implementation studies focused on mental health and T1D; studies dedicated to developing precision medicine approaches for T1D; and a consortium focused on feasibility of screening children in Canada for T1D risk. Partnership projects are collectively engaging 125 researchers, >120 collaborators, >150 research staff, and >90 trainees from across Canada.
- Benefits of our research extend beyond T1D, helping **advance knowledge** which benefits type 2 diabetes and other autoimmune diseases.
- **Mobilization and translation of knowledge** generated by research is crucial to enable real-world impacts on clinical practice and policy and to ensure all our stakeholders clearly understand the impact of the research we're funding. JDRF-funded research teams are encouraged to dedicate grant funds to knowledge mobilization activities and to report back, and JDRF amplifies these through the activities of our own well-defined knowledge mobilization and translation strategy.

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The ingredients needed to advance T1D research rapidly towards commercialization and create upwards of 200 good jobs in Canada would include an investment in these key initiatives:

- **Catalyst grants** (to build the innovation pipeline)
- **Translational research grants** (to advance innovation to clinical trial stage)
- **Clinical trials**
- **Funds to sustain T1D data initiatives** (to drive data-driven research and facilitate clinical trial recruitment)
- **Early career researcher grants** (to build capacity in the sector)
- **T1D innovation network** (to encourage greater collaboration between basic, translational and clinical researchers working in T1D and complementary fields, to drive innovation)
- **T1D innovation think tank** (an advisory group of experts in commercialization)
- **Patient engagement** (to maintain a focus on patient-oriented research)
- **Research operations**

## CONCLUSION

Canada can be a successful world leader in translating and commercializing incredible research innovation, thereby building up the Canadian life sciences economy with highly skilled jobs and make once lifelong diseases like T1D curable. We just need the ambition, will and investment.

In the post-pandemic future of Canada, we must continue to establish our competitive position on the global stage, which includes translating research success into health innovation and impact by increasing coordinated research funding, collaboration, and the talent pipeline. JDRF Canada is a trusted partner who has the expertise, demonstrated ability and commitment to do exactly this.



Notes:

1. Diabetes Canada. (2022). Diabetes rates continue to climb in Canada. Retrieved from <https://www.diabetes.ca/media-room/press-releases/diabetes-rates-continue-to-climb-in-canada>
2. Global T1D Index data. (2023). T1D Index ([T1D Index \(shinyapps.io\)](https://shinyapps.io)).
3. Innovation, Science, and Economic Development Canada. (2021). Canada’s Biomanufacturing and Life Sciences Strategy. Government of Canada.
4. Public Health Agency of Canada. (2022). Framework for Diabetes in Canada. Government of Canada.