



## Diabetes Research: [Quebec](#)

Since 1971, Diabetes Canada (formerly the Canadian Diabetes Association) has proudly supported outstanding diabetes research in Canada, administering more than \$140 million in research grants, awards and partnerships to scientists and clinicians who have dedicated their careers to the fight against diabetes.

Since Banting and Best's discovery of insulin in Toronto, in 1922, Canadian researchers have made huge strides and key advances in mapping and understanding the physiology, biochemistry and genetics of diabetes. This is why we choose, each year, to fund Canada's most renowned researchers in their quest for new and innovative developments in the prevention, treatment and management of diabetes. And although the research is diverse in its scope, covering a broad range of specialties and topics, the underlying goal of each study remains the same - to improve the quality of life of people living with diabetes and to find a cure.

Every year, our researchers continue a tradition of innovation and discovery. Below is a list of the scientists and clinicians in Quebec who are currently funded by Diabetes Canada.

### Research Grants & Awards

#### [Dr. Claudia Gagnon \(New Investigator Award\)](#)

Centre de recherche du CHUL (CRCHUL) University Laval (Laval, Québec)

Funded: 2017-2020

**Title:** Bone health after bariatric surgery in people with type 2 diabetes

Bariatric surgery is gaining in popularity in people with type 2 diabetes. Dr. Gagnon is studying the impact of three different bariatric procedures - sleeve gastrectomy, Roux-in-Y gastric bypass, and biliopancreatic diversion - on bone fragility, a complication of type 2 diabetes. This study is important for patients with type 2 diabetes undergoing bariatric surgery, as well as for health-care professionals to inform on the benefits and risks of each bariatric procedure. It will also help identify factors that could be tested to prevent or treat bone fragility in people with type 2 diabetes.

### **Dr. Ahmad Haidar (New Investigator Award)**

McGill University (Montréal, QC)

Funded: 2017-2020

**Title:** The development of a multi-hormone fully-automated artificial pancreas system

Dr. Haidar is developing a next-generation, triple-hormone, fully automated artificial pancreas system for people with type 1 diabetes. This novel artificial pancreas automatically regulates glucose levels by delivering insulin, pramlintide, and glucagon in response to continuous glucose sensor readings. This new system does not require input from the user around meals and would eliminate the need for multiple daily injections, carbohydrate counting, and meal categorization. Such a system would also help those with type 1 diabetes to maintain tight glucose control and achieve their recommended blood glucose targets.

### **Dr. Stewart Jeromson (Post-Doctoral Fellowship)**

Supervisor: Dr. Jennifer Estall

Clinical Research Institute of Montreal (IRCM)

Funded: 2018-2020

**Title:** Uncovering novel strategies to improve PGC-1 stability in diabetes

The main complications of diabetes include the inability of cells within the pancreas to release insulin, the hormone that reduces glucose in the blood, and uptake of glucose into cells. There is a protein, PGC-1, that is critical for the release of insulin and it is often reduced in people with diabetes, and there are differences in the genetic code for this protein between people that regulate the amount PGC-1 in the cells. Dr. Jeromson is trying to determine why this genetic difference causes low PGC-1 protein in key organs and how this difference is linked to the survival and function of these important cells. As diabetes is likely caused by a combination of genes and poor lifestyle, he will also aim to understand how this protein is affected by environmental factors (i.e. nutrition). These findings would allow for better prediction of who is at risk of developing diabetes and help in the development of new strategies to prevent diabetes.

### **Dr. Elite Possik (Post-Doctoral Fellowship)**

Supervisor: Dr. Marc Prentki

University of Montréal (Montréal, QC)

Funded: 2017-2020

**Title:** Role of glycerol-3-phosphate phosphatase in energy metabolism and insulin homeostasis

Dr. Possik is studying the properties of a newly discovered enzyme called glycerol 3 phosphate phosphatase (G3PP) which converts sugar to glycerol, a less toxic by-product than glucose. Dr. Possik believes G3PP may prove to be important in reducing the toxic effects of excess sugar and also fat burden in people with diabetes. Studying this enzyme, how it's controlled, and its beneficial effects could lead to new medications to increase G3PP function and effectively treat type 2 diabetes and obesity.

**Dr. Rémi Rabasa-Lhoret (Diabetes Investigator Award)**

Clinical Research Institute of Montréal (Montréal, QC)

Funded: 2017-2022

Title: Strategies to reduce exercise-induced hypoglycemia in adults with type 1 diabetes

Fear of hypoglycemia is a major limitation for physical activity for patients with type 1 diabetes. Strategies to reduce the risk of exercise-induced hypoglycemia, such as reduction in insulin dose in the hours preceding the exercise and food intake, have not been well validated and new avenues are emerging. In this study, Dr. Rabasa-Lhoret will be assessing the efficacy of:

- Multiple small snacks during exercise vs. a large snack before exercise to reduce exercise-induced hypoglycemia
- Novel technologies, such as the artificial pancreas, to avoid exercise-induced hypoglycemia
- Medication increasing concentrations of glucagon (hormone to increase blood glucose) to reduce exercise-induced hypoglycemia
- Insulin reduction vs. bedtime snack to prevent nocturnal hypoglycemia after daytime exercise.

The results of these trials will identify new strategies to reduce hypoglycemia and could be used to encourage patients with type 1 diabetes to practice regular physical activity. Increased physical activity should improve quality of life, could improve glucose control and should reduce the risk of obesity and cardiovascular disease.

**Dr. Przemyslaw Sapielha (Diabetes Investigator Award)**

Maisonneuve-Rosemont Research Centre (Beaconsfield, QC)

Funded: 2018-2021

**Title:** Cellular senescence in diabetic retinopathy

The retina is a thin layer of nervous tissue at the back of the eye that transforms light into sight. During diabetes, the blood vessels that supply nutrients and oxygen to the retina degenerate and the nerve cells cease to function appropriately. This is called diabetic retinopathy and is the most common complication of diabetes and the leading cause of blindness in working-age individuals. In this study, Dr. Sapieha will explore a novel and exciting paradigm in diabetic retinopathy where diabetic neurons in the retina enter a state of dormancy to protect themselves from diabetes-related stress. He and his team will explore avenues of waking these neurons in order to restore vision. Ultimately, he hopes to be able to develop new and more effective therapies for the treatment of retinopathy.

## **Chairs & Partnerships**

### **Innovative Clinical Trials**

Dr. Simon Bacon

Concordia University (Montréal, QC)