Diabetes Research: USA

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 the United States who are currently funded by Diabetes Canada.

Research Grants & Awards

Dr. Anne-Marie Carreau (Post-Doctoral Fellowship)
Supervisor: Dr. Melanie Cree-Green
University of Colorado Denver (Denver, CO)
Funded: 2017-2019
Title: Mitochondrial function in PCOS linking hepatic steatosis and insulin resistance

Adolescents with polycystic ovary syndrome(PCOS) are at higher risk of developing type 2 diabetes and fatty liver disease. Dr. Carreau is exploring the possibility that fatty liver may partly explain the risk of diabetes as it may lead to a dysfunctional way of metabolising fatty acids and sugar by the liver. This may be due to the mitochondria, which is the part of the cell that produces energy. Dr. Carreau believes that girls with PCOS do not produce as much energy in their liver as girls who do not have PCOS. The overload of fatty acids that are not converted to energy in the liver may contribute to the increase in blood glucose

levels. This research could lead to more effective methods of prevention for those at high risk of type 2 diabetes.

Dr. Zhi Chao Feng (Post-Doctoral Fellowship)

Supervisor: Dr. Dongsheng Cai
Albert Einstein College of Medicine (Bronx, NY, USA)
Funded: 2016-2019

Title: Control of obesity and obesity-related diabetes via synchronization of cytokine diurnal rhythms within the hypothalamus.

The hypothalamus is the part of the brain that regulates how much mammals eat and how much energy they use and store. Recently, studies have suggested that the hypothalamus can get inflamed in type 2 diabetes. Dr. Feng has shown that the molecules that cause inflammation have a day-night rhythm, and his study will compare this rhythm in mice fed a regular diet and mice fed a high-fat diet, to find out if this activity could be reset to reduce the risk of developing obesity and associated health problems, like type 2 diabetes.

Dr. Rucha Patel (Post-Doctoral Fellowship)

Supervisor: Dr. Barbara Kahn
Beth Israel Deaconess Medical Centre (Boston, Mass., USA)
Funded: 2017-2020

Title: Biosynthetic regulation of a novel class of lipids with anti-diabetic and anti-inflammatory effects

Dr. Patel and her team recently discovered a structurally new class of lipids made in humans that have anti-diabetic effects. Levels of these lipids are decreased in insulin-resistant humans and mice. When high-fat-diet-fed diabetic mice were treated with these novel lipids, their insulin sensitivity improved. These results provide evidence for a beneficial role of theses lipids and suggest that a decrease in their levels in humans could potentially contribute to the development of insulin resistance. This project aims to discover the enzymes responsible for the production of these lipids and determine if reduced production of the beneficial lipids contributes to decreased levels present in insulin-resistant people. This work could lead to the development of new treatments to restore the beneficial lipid levels in insulin-resistant people which may prevent or treat type 2 diabetes.

Dr. Anu Shah (Post-Doctoral Fellowship)

Supervisor: Dr. Richard T. Lee
Harvard University (Cambridge, MA, USA)
Funded: 2016-2019

Title: Thioredoxin interacting protein (TXNIP) enhances fructose uptake by small intestine in the diabetic state

Fructose is a natural sugar found in fruits and vegetables. Having too much fructose from items such as corn syrup, sweet drinks, and sweetener has been linked to type 2 diabetes and other health problems. A protein called TXNIP, that takes fructose into the cells of the small intestine, is high in people with diabetes. Dr. Shah is studying how TXNIP ushers fructose into the cells of mice with type 2 diabetes. Dr. Shah hopes to find ways to slow this process to block the harmful effects of eating and drinking fructose.

Dr. Michael Shum (Post-Doctoral Fellowship)

Supervisor: Professor Orian Shirihai
University of California-Los Angeles (Los Angeles, CA, USA)
Funded: 2016-2019

Title: Role of mitochondrial ABCB10 (ATP-binding cassette B10) on beta-cell function

Mitochondria are the “engines” of the cells. They take sugar and fat and convert them into energy. These engines can become damaged in the insulin-producing beta cells of people with type 2 diabetes. Dr. Shum is investigating a protein in the mitochondria called ABCB10. He will test if turning off ABCB10 protects the mitochondria of the beta cells and, in turn, helps keep insulin production at normal levels.