

Dr. Vincent Poirout



PREVENTION | BIOMEDICAL RESEARCH

Project: How do nutrients stimulate pancreatic beta cells to replicate?

Thank you for your generosity. Diabetes Canada is grateful to our donors for supporting critical research that will end diabetes.

Through your support, Dr. Vincent Poirout, Director of Research and Innovation at University of Montreal Hospital Center (CHUM) and Scientific Director of the CHUM Research Centre in Montreal is bringing us one step closer to preventing gestational and type 2 diabetes.

In healthy individuals, blood sugars are controlled by a hormone called insulin, which lowers blood sugar levels. Insulin is produced by cells in the pancreas called beta cells. For people with type 2 diabetes, their beta cells can no longer produce enough insulin to control their blood sugars, which can lead to health complications such as nerve damage, sight loss, heart disease, kidney failure, anxiety, amputations, and even death.

Today, more and more people are exposed to abundant and calorie-rich food which together with sedentary lifestyles and other risk factors have contributed to a dramatic increase in type 2 diabetes. When beta cells are exposed to excessive nutrients – in particular, carbohydrates and fat – the cells initially replicate and produce more insulin to maintain normal blood sugar levels. In approximately 20% of individuals, however, this mechanism fails, and type 2 diabetes occurs.

In pregnant women, a natural resistance to insulin develops that is addressed by increased beta cell replication, as otherwise gestational diabetes can occur.

Dr. Poirout and his lab are working to understand how beta cells replicate, and how nutrients trigger beta cell replication. They will:

1. Test whether beta cell replication in response to nutrients involves signals caused by oxidative stress, or cell damage caused by free radicals
2. Investigate whether enzymes can be used to change beta cell replication in response to a high fat diet
3. Assess whether increasing oxidative stress signals increase beta cell replication

This project will provide critical information around beta cell replication and help the team design therapeutic approaches to prevent or delay gestational or type 2 diabetes.