

Dr. Patrick MacDonald



CURE | BIOMEDICAL RESEARCH

Project: A novel regulator of glucagon

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

Through your support, Dr. Patrick MacDonald, Professor of Pharmacology at the University of Alberta and Canada Research Chair in Islet Biology, is bringing us one step closer to better blood sugar level control for people living with diabetes.

In healthy individuals, blood sugars are controlled by a hormone called insulin, which lowers blood sugar levels, and another hormone called glucagon, which increases blood sugar levels. Insulin and glucagon are produced by cells in the pancreas called islet cells. For people with diabetes, their blood sugar levels are unstable because their islet cells can no longer produce enough insulin to lower blood sugars and no longer produce glucagon in a controlled way.

Without controlled glucagon production, people with diabetes experience higher high blood sugar levels and lower low blood sugar levels, which can lead to significant health complications and impact a person's quality of life.

Dr. MacDonald is studying a protein called TMEM55A that helps control glucagon production in islet cells. He and his lab are exploring:

1. The role of TMEM55A in glucagon regulation in type 1 and type 2 diabetes
2. Removing TMEM55A and how this impacts islet cells and glucagon production
3. The change in signals produced by TMEM55A in islet cells from donors with type 1 or type 2 diabetes
4. Blocking TMEM55A to improve glucagon control in diabetes

This research sets the stage for future therapeutics to help reduce low blood sugar levels and improve blood sugar management in people with diabetes.