Title: VEGFB and its heart-protective role during diabetes

Researchers:

Dr. Brian Rodrigues, Nominated Principal Investigator: University of British Columbia

Research area: Type 1 diabetes

Award: End Diabetes 100 Award, 2021-2024

Summary:

Relevance: In Canada, more than 11 million individuals live with diabetes or pre-diabetes. With the progression of diabetes comes long-term complications that include damage to the heart, a leading cause of death. The heart is a constantly beating organ and requires a steady supply of fuel for energy, which it obtains from sugar and fats. During diabetes, the heart has limited capacity to use sugar and must adapt to largely using fats. The increased reliance upon fats leads to dire consequences and cell death. It is within this framework that a protein produced mainly in the heart, VEGFB, has emerged as a potentially efficacious agent against diabetic heart disease by shifting energy production back to using sugar and preventing cell death.

Purpose: Our objective is to test whether VEGFB is protective against the development of heart complications following diabetes.

Methods: We have a rat model that makes many copies of VEGFB specifically in the heart, allowing us to investigate its characteristics and functions. To induce diabetes, we will use a chemical toxin that targets and destroys cells in the pancreas that make insulin. In live animals and isolated heart cells, we will assess fuel utilization and heart function.

Outcome: While clinical management of diabetes has focused on drugs that lower blood sugar, there are limited therapies that target heart failure in this condition. This project will highlight the unique beneficial properties of VEGFB to overcome fuel dysregulation in the diabetic heart, making it a promising candidate for treating people with diabetes who are at risk of developing heart disease.