Marc Prentki is a full professor at Université de Montréal's Department of Nutrition and a researcher at the Centre hospitalier de l'Université de Montréal Research Centre. Credit: CRCHUM

To date, no cure has been found for type 2 diabetes, the most common form of this chronic disease which affects nearly 2.5 million Canadians. Marc Prentki's research seeks to understand how the functioning of the cells of the pancreas is disrupted when this disease occurs. Marc Prentki is a full professor at Université de Montréal's Department of Nutrition and a researcher at the Centre hospitalier de l'Université de Montréal Research Centre (CRCHUM).

In normal people, the level of sugar in the blood increases when they eat sugary foods. To restore equilibrium, the pancreas then secretes insulin, an important hormone that controls the body's use of sugar (glucose) and fats. Marc Prentki, a biochemist who specializes in diabetes , has discovered some mechanisms that explain how glucose stimulates the beta cells in the pancreas to make them secrete insulin and how this process is impaired in people with type 2 diabetes. This form of the disease usually appears in adulthood and can result in serious complications and early death.

Professor Prentki, who holds the Canada Research Chair in Diabetes and Metabolism, is trying to identify the defects that occur in the beta cells of the pancreas when the disease first emerges and as it worsens over time. He is especially interested in the signals that act as intermediaries between glucose and insulin within the cells.

Supporting research on type 2 diabetes and obesity

In 2014, Dr. Prentki's laboratory discovered some important roles played by alpha/beta-hydrolase domain 6 (ABHD6), a new key enzyme in the metabolism of fats. He showed that this enzyme plays a role in the stimulation of insulin secretion by glucose, and that if pharmacologic agents are used to inhibit ABHD6, insulin secretion increases. Even more interestingly, mice that have been genetically modified so that they do not express this enzyme, or that have been treated with compounds that inhibit it, have less appetite, are protected from obesity, do more exercise voluntarily, and are more sensitive to insulin. These metabolically ideal mice also have another strange trait: their adipose (fatty) tissue changes from white to brown. Since brown adipose tissue burns fat, this may explain why these mice are protected from obesity and diabetes.

Recently, Dr. Prentki identified another enzyme involved in glucose metabolism. This enzyme plays an important role in controlling blood glucose and storing fats. Thanks to funding from industry and his CIHR Foundation grant, Dr. Prentki will be testing molecules that have the potential to act on these enzymes. He expects to develop an effective medication against diabetes and obesity within the next 10 years or so.

While exercise and a healthy diet can help to prevent type 2 diabetes or delay its onset, the only medications currently available, such as metformin and insulin, can only delay the complications of this disease, such as kidney failure, retinopathy, and neuropathies. If a treatment could be found that attacked both the deregulation of the beta cells in the pancreas and the causes of obesity, it would represent a revolution. Such a medication could not only stimulate insulin secretion in people with type 2 diabetes, but also help obese and diabetic people to lose weight. That is what Marc Prentki is looking for.

Provided by: University of Montreal

This topic, among others, will be discussed at **the first Middle East Practical Diabetes Meeting which will be held at Hotel Marriott Al Jaddaf, Dubai on April 13-14, 2016.**