

Discovery of an early predictor of increased diabetes risk

January 15 2014

A Montréal research team led by Jennifer Estall at the IRCM discovered that a protein found in muscle tissue may contribute to the development of type 2 diabetes later in life. The study's results, published in today's printed edition of the scientific journal *American Journal of Physiology - Endocrinology and Metabolism*, indicate that the protein could be a promising early predictor of increased diabetes risk.

"My team and I studied PGC-1 α , a protein responsible for regulating the production of energy in cells," explains Dr. Estall, Director of the Molecular Mechanisms of Diabetes research unit at the IRCM.

"Surprisingly, we found that young mice lacking this protein in their [muscle tissue](#) appeared healthier, as they had lower [blood sugar levels](#) before and after meals. So, at first, we thought having less of this protein was actually better."

"However, as they aged, the mice lacking the PGC-1 α protein developed significant glucose intolerance and insulin resistance, which are hallmarks of type 2 diabetes," adds Dr. Estall. "As a result, we discovered that chronically low levels of this protein in muscle may contribute to the development of diabetes later in life."

While the levels of PGC-1 α were only altered in muscle, the scientists observed detrimental effects on the health of other tissues. The study showed that the absence of PGC-1 α in muscle increases inflammation in the liver and adipose tissue (fat), revealing a novel link between muscle metabolism and the chronic inflammatory state of the body often

associated with metabolic diseases such as type 2 diabetes and cardiovascular disease.

"Our study also suggests that low levels of PGC-1 α in muscle could be a promising new way of predicting increased risk of type 2 diabetes at a young age, and drugs to increase the levels of this [protein](#) may help prevent or delay the progression of the disease," concludes Dr. Estall.

According to the Canadian Diabetes Association, more than nine million Canadians are living with diabetes or prediabetes, and 90 per cent of those with diabetes have [type 2 diabetes](#). The Association states that the first step in preventing or delaying the onset of complications associated with [diabetes](#) is recognizing the risk factors, signs and symptoms of the disease.

More information: ajpendo.physiology.org/content/0/ajpendo.00578.2013

Provided by Institut de recherches cliniques de Montreal

Citation: Discovery of an early predictor of increased diabetes risk (2014, January 15) retrieved 23 April 2024 from

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