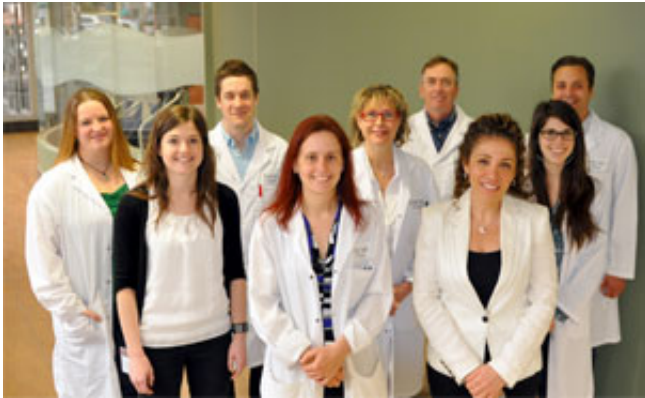


New mechanism to prevent type 2 diabetes in obese individuals

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Nathalie St-Pierre, Catherine Leroux, Simon Bissonnette, Annie Tardif, Dany Gauthier, Robert Dufour, May Faraj, Valérie Lamantia, Hanny Wassef. Credit: IRCM

A new Montréal study conducted by Dr. May Faraj, associate research professor at the Université de Montréal and invited scientist at the IRCM, along with her research team and medical collaborators, shows that the number of particles carrying bad cholesterol in the blood is an important factor in promoting the risk for type 2 diabetes in obese individuals. Their results are published in the May issue of the *Journal of Lipid Research*. This scientific breakthrough may help prevent diabetes by targeting treatments to higher-risk individuals.

Dr. Faraj's research aims at exploring new mechanisms that could favour

the development of [type 2 diabetes](#) and various dietary interventions that may help prevent diabetes within the Canadian population. For this project, her team studied the function of the [adipose tissue](#) (or body fat), which is specialized in storing excess energy from the diet as fat. In humans, adipose tissue is primarily located beneath skin, but can also be found around [internal organs](#).

"Following a meal, dietary fat is transported to different locations in the body, including adipose tissue," says Dr. Faraj. "However, if the adipose tissue is not functioning properly, fat accumulates instead in non-adipose tissue such as the liver, muscle and pancreas, which decreases the body's ability to utilize [dietary sugar](#). Many people have a common misconception that it is better to block adipose tissue function to reduce obesity but, in fact, poorly-functional adipose tissue can increase the risk for type 2 diabetes and other cardiovascular diseases."

The accumulation of fat in the liver increases the production of low-density lipoprotein (LDL), the particles commonly referred to as "[bad cholesterol](#)." While the human body needs a normal level of LDL to ensure cell growth and repair, high levels can cause a build-up of plaque in the [artery walls](#). This subsequently leads to narrowing of the arteries and increased risk of heart attack and stroke. A high number of LDL particles is also an established risk factor for cardiovascular disease.

"We examined the relationship between the number of LDL particles and adipose tissue function in postmenopausal overweight and obese women," explain Simon Bissonnette and Huda Salem, graduate students on Dr. Faraj's team and first authors of the study. "These women were all considered healthy because they were non-smokers, did not take any medication and did not have any chronic diseases like diabetes or cardiovascular disease. We discovered that a high number of LDL particles is not only a consequence of dysfunctional adipose tissue, but that it also plays an active role in causing adipose tissue to become less

functional."

"Our study's results suggest that reducing the number of LDL particles can improve adipose tissue function and, in turn, reduce the risk of developing both type 2 diabetes and cardiovascular disease in [obese individuals](#)," adds Dr. Faraj. "This discovery may help us identify people with a higher risk of developing such cardiometabolic diseases and target them with pharmaceutical or dietary interventions to prevent the onset of disease."

"The Canadian Institutes of Health Research is proud to support Dr. May Faraj in leading her team to make these discoveries that will positively impact the health of Canadians," says Dr. Phil Sherman, Scientific Director at CIHR's Institute of Nutrition, Metabolism and Diabetes. "Arming Canadians with information about whether they are at risk for type 2 [diabetes](#) and how they can avoid it is key to lowering the rate of this preventable condition." /2

For more information, please refer to the article summary published online by the *Journal of Lipid Research*: www.jlr.org/content/54/5/1466.

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