

# Scientists discover a natural molecule to treat type 2 diabetes

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Researchers at the Université Laval Faculty of Medicine, the Quebec Heart and Lung Institute Research Center, and the Institute of Nutrition and Functional Foods have discovered a natural molecule that could be used to treat insulin resistance and type 2 diabetes. The molecule, a derivative of omega-3 fatty acids, mimics some of the effects of physical exercise on blood glucose regulation. The details of the discovery made by Professor André Marette and his team are published today in *Nature Medicine*.

It has been known for some time that [omega-3 fatty acids](#) can help reduce [insulin resistance](#) caused by a diet high in saturated fat. In their earlier work, André Marette and his colleagues had linked these effects to a bioactive lipid called protectin D1. In investigating further, they discovered that another member of the same family named protectin DX (PDX) triggers the production and release of interleukin 6 (IL-6) in muscle cells, a response that also occurs during physical exercise. "Once in the bloodstream, IL-6 controls glucose levels in two ways: it signals to the liver to reduce glucose production and acts directly on the muscles to increase [glucose uptake](#)," explains the researcher who is also Scientific Director of Université Laval's Institute of Nutrition and Functional Foods.

The researchers used transgenic mice lacking the IL-6 gene to demonstrate the link between PDX and IL-6. PDX had very little effect on the control of [blood glucose](#) in these animals. In similar tests conducted on obese diabetic rats, PDX was shown to dramatically

improve responsiveness to insulin, the hormone which regulates blood glucose. "The mechanism of action described for PDX represents a new therapeutic strategy for improving glucose control," proposes the researcher. "Its efficacy may be comparable with that of certain drugs currently prescribed to control glycemia."

Even though PDX appears to mimic the effect of [physical exercise](#) by triggering IL-6 secretion in the muscles, André Marette warns that it is not a substitute for physical activity. "Exercise has cardiovascular and other hormonal benefits that go well beyond its metabolic effects on the muscles," adds the researcher whose work is supported by the Canadian Institutes of Health Research (CIHR) and the Canadian Diabetes Association.

Professor Marette and Université Laval have filed a patent application for PDX and its therapeutic applications. "For us, the next step is to demonstrate the antidiabetic effects in humans and determine the receptor through which PDX acts."

**More information:** Protectin DX alleviates insulin resistance by activating a myokine-liver glucoregulatory axis, [DOI: 10.1038/nm.3549](https://doi.org/10.1038/nm.3549)

Provided by Laval University

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