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Dr. Richard Lehner, Department of
Pediatrics and Cell Biology at the
University of Alberta

So the Beat Goes On

This enzyme reduces fat and cholesterol in laboratory tests

By: Arpana Chakravarty and Hayley Millard

By manipulating triacylglycerol hydrolase (TGH), an enzyme that plays a role in fat metabolism, researchers from the University of Alberta have reduced the levels of triglyceride fat and bad cholesterol in mice. This breakthrough may be used to develop a new pharmaceutical that could reverse the enzyme's role in fat metabolism, and discourage the onset of obesity-related diseases such as type II diabetes.

Dr. Richard Lehner, from the Department of Pediatrics and Cell Biology at the University of Alberta, proved that inactivation of TGH led to lower blood levels of bad cholesterol and triglycerides in mice, and the mice did not suffer any side effects.

“Heart disease and other obesity-related diseases are leading causes of death in North America,” says Lehner. “We are a fat nation. Research is necessary to combat this epidemic.”

Obesity occurs when the body stores an excessive amount of fat called triglyceride. Meat and dairy products are dietary sources of cholesterol and triglycerides, but excessive consumption of foods such as of sugar-rich soft drinks, will also lead to increased triglyceride levels. A diet high in saturated fats, along with overeating and minimal exercise, will lead to obesity.

The TGH enzyme assists in the assembly of fat and cholesterol-carrying lipoproteins that are exported into

the blood stream from the small intestine and the liver. The liver-derived lipoprotein called very-low density lipoprotein (VLDL) is converted to low-density lipoprotein (LDL) in the blood. LDL is referred to as the carrier of “bad cholesterol”.

If the blood contains too much LDL cholesterol, the surplus is deposited into the arteries that bridge the heart and the brain. Continuous build up can create a blockage that could lead to a heart attack or stroke.

This breakthrough may be used to develop a new pharmaceutical that could reverse the enzyme's role in fat metabolism, and discourage the onset of obesity-related diseases such as type II diabetes.

Lehner discovered that the inhibition of TGH decreases the secretion of VLDL, which consequently lowers the blood VLDL and LDL levels.

The drug would be of great benefit to those who are genetically obese and would be a short-term solution to obesity as a bridge to successful lifestyle changes. The most effective method of preventing obesity is for individuals to monitor their food intake and practice a healthy, active lifestyle.

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Others involved in the research include postdoctoral fellows Dr. Mustafa Alam, Dr. Enhui Wei, and Dr. Yassine Ben Ali, and graduate students Dean Gilham and HuaJin Wang at the University of Alberta.



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