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New Link Between Obesity and Type 2 Diabetes: Researchers Discover New Way Fats Kill Beta-cells

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Researchers at the University of British Columbia have discovered a new link between increased level of fat in the human body and Type 2 diabetes. Researchers believe this will open new fields in diabetes research and could lead to new therapies.

Elevated fats (lipids) in the blood of obese people are a known risk factor for Type 2 diabetes, a preventable but incurable disease that affects millions worldwide.

The discovery, published in the *Proceedings of the National Academy of Sciences*, explains that high levels of fat in the blood destroy insulin-producing beta-cells in the pancreas by reducing the protein Carboxypeptidase E (CPE) a process that leads to Type 2 diabetes.

CPE is a protein in the beta-cells of the pancreas. It plays a key role in producing insulin, but its reduction had not been previously explored as a potential cause of beta-cell failure.

“Scientists have been hunting for the major protein targets of lipids in beta-cells for many years and we discovered that CPE is it,” says Jim Johnson, senior author of the paper and assistant professor in UBC’s Department of Cellular and Physiological Sciences and the Department of Surgery within the Faculty of Medicine. “Using a powerful new technology called proteomics, we were the first to show that fats can

dramatically reduce the levels of CPE, thereby linking one of the most important diabetes risk factors to this important protein that controls beta-cell function and survival."

The pancreas produces insulin to control the level of glucose in the body. However in people with Type 2 diabetes, either the pancreas becomes unable to produce sufficient amounts of insulin, or the body can't use the insulin the pancreas produces.

"Our research is the first to suggest that the reduction in CPE causes the beta-cells to clog-up," says Johnson. "In doing so, non-functional insulin is produced and the beta-cells die from the stress. Understanding the pathway of this disease, how it is initiated and how it progresses, will lead to the design of new therapies."

This study was done in collaboration with Washington University in St. Louis and funding was provided by The Canadian Diabetes Association. Dr. Johnson is a Michael Smith Foundation for Health Research Scholar and a Canadian Institutes for Health Research New Investigator.

According to the Canadian Diabetes Association, diabetes affects an estimated 246 million people worldwide, and is expected to reach 380 million by 2025.

Diabetes is a contributing factor in the deaths of approximately 41,500 Canadians each year. Canadian adults with diabetes are twice as likely to die prematurely, compared to people without diabetes. Life expectancy for people with Type 2 diabetes may be shortened by 5 to 10 years.

There is no cure for diabetes, however the onset of Type 2 diabetes may be prevented or delayed through increased physical activity, healthy eating and weight loss.

Source: University of British Columbia