

Popular science summary

Title of the project: Regulation of GLP-1-Producing Cells – the influence of a diabetic milieu characterized by hyperlipidemia and hyperglycemia

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Type 2 diabetes is a chronic disease in which the body cannot downregulate high blood sugar levels, causing severe damages to body's organs. The global prevalence of this disease has been rising over the past decades, and type 2 diabetes is now one of the major health issues in the world. As type 2 diabetes is characterized by insulin resistance and relative low level of insulin, much research has focused on reducing insulin resistance and/or increasing insulin production in patients with type 2 diabetes. Interestingly, the body produces a hormone, called glucagon-like peptide-1 (GLP-1), which, among other things, reduces insulin resistance and increases insulin production. This hormone is produced by a group of intestinal cells known as L-cells. Unfortunately, type 2 diabetic patients tend to have fewer L-cells. Therefore, an approach to diabetes therapy has been suggested in which one aims to enhance L-cell density and endogenous GLP-1 production in patients with type 2 diabetes. To achieve this goal, one needs to acquire a detailed knowledge and a good understanding of how L-cells are regulated. This study was an attempt to understand the behavior of L-cells under diabetic conditions characterized by hyperlipidemia (excess of sugar) and hyperglycemia (excess of lipids). Our study shows that high levels of palmitate (the most abundant saturated free fatty acid bound to human serum albumin) may have deleterious effects on L-cells, whereas moderate levels of oleate (the most abundant unsaturated fatty acid in humans) may protect them from the detrimental effects of palmitate.