# Novel Target for Treatment of Type-2 Diabetes

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## Technology description

This invention describes a method of treatment of type-2 diabetes using activators of adipose-resident type 1 natural killer T (NKT) such as lipid antigens and cytokines that promote M2 macrophage polarization.
Approximately 29.1 million people in the U.S. are living with diabetes in 2012, that being 9.3% of the population. 95% of them suffer from type 2 diabetes mellitus, the most common form of diabetes.
The present method offers a breakthrough in treatment options for diabetes patients. Cornell researchers discovered that adipose tissue contains a unique and previously unidentified population of lipid-sensing NKT cells that play a key role in modulating immune cell response, macrophage polarization, and glucose homeostasis. This population of CD1d-restricted type 1 NKT cells has been shown to decrease while the body mass index and glucose intolerance increase consequently (Fig.1). Thus, it is proven that the activation of these NKT cells is able to lead to the reduction of inflammation in the adipose environment and improve glucose homeostasis.
In experiments, the method significantly improved glucose tolerance in diet-induced obesity mice (HFD) that received a lipid antigen such as α-galactosylceramide (αGalCer). The inventors demonstrated that the effect of α-GalCer was NKT cells-depend (Fig.2) and HFD mice challenged with α-GalCer had an improved glucose tolerance, approaching the LFD level (Fig.3).

## Application area

A novel target for treatment of type-2 diabetes
Screening method to identify activators of adipose-resident NKT cells

## Advantages

Improves glucose tolerance
Can helps attenuate inflammation in adipose tissues
Targets specifically type 1 NKT cells in adipose tissues, which are predominantly $CD4^{-}CD8^{-}$; unlike the type 1 NKT cells found in the liver, spleen, etc.

Institution

Cornell University

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