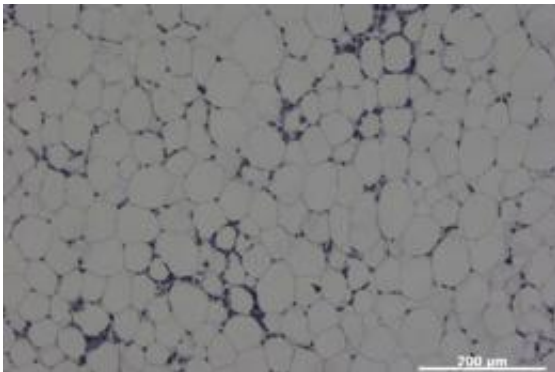


Killer T-cells found to counter obesity-related diabetes

May 8 2012, By Krishna Ramanujan

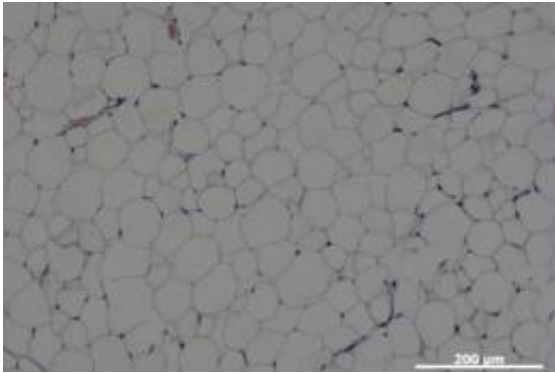


The two images show histological sections of white fat tissues from mice; the top panel shows tissues have been injected with the compound α -galactosylceramide that activates NKT cells (stained blue); image below is a control. (Qi Lab)

(Medical Xpress) -- For years, researchers have known that obesity, type 2 diabetes and low-level inflammation are linked, but how they are connected has not been well understood.

A recent Cornell-led study has found that a type of [immune cells](#) -- called natural killer T (NKT) cells -- is an important part of the puzzle.

Two hallmarks of diabetes include insulin resistance, the inability to effectively respond to insulin to control blood sugar, and [glucose intolerance](#), the inability to metabolize glucose.



(Qi Lab)

"When tissue is inflamed, it becomes insulin resistant," said Ling Qi, assistant professor of nutritional sciences.

The study found, however, that "activation of NKT cells reduces inflammation, and also reduces insulin resistance and increases [glucose tolerance](#)," added Qi, senior author of the study published April 20 in the [Journal of Biological Chemistry](#). Yewei Ji, a postdoctoral researcher in Qi's lab, is the paper's lead author.

In the study, team members at the University of Hong Kong examined tissues from 39 healthy premenopausal Chinese [adult women](#) and correlated the NKT cell levels with the women's [body mass index](#) (BMI). They found that as BMI increased, NKT cell levels in adipose (fat) tissue decreased significantly.

"The mechanism for that is not clear," said Qi, "but it points to the significance of our study that you need to activate these cells to have some sort of impact."

At Cornell, Qi and colleagues injected mice that were fed Western-type

diets --where 60 percent of calories come from fat -- with a lipid compound (α -galactosylceramide) that is known to strongly and specifically activate NKT cells. The result: The inflammation and degrees of [insulin resistance](#) and glucose intolerance in the mice fell.

"The mice were eating a Western diet but their metabolic response was closer to mice that were eating a healthy diet," Qi said.

Next, the researchers plan to alter the regimen of lipid treatment to see if they can induce an even better effect in animals and try to identify compounds in foods that naturally activate NKT cells in humans. The researchers hope to identify particular foods that obese diabetics could eat to achieve the positive effects.

A patent has been filed as a result of this study.

Co-authors include researchers from the University of Hong Kong, Harvard University's School of Public Health, the National Institute on Alcohol Abuse and Alcoholism of the National Institutes of Health, and Wageningen University in the Netherlands.

The study was funded by the National Institutes of Health, Hong Kong Collaborative Research Fund, Netherlands Nutrigenomics Center, Cornell, Howard Hughes Medical Institute, and the American Diabetes Association.

Provided by Cornell University

Citation: Killer T-cells found to counter obesity-related diabetes (2012, May 8) retrieved 6 May 2024 from <https://medicalxpress.com/news/2012-05-killer-t-cells-counter-obesity-related-diabetes.html>

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