

# Gamma-Delta T cells may play a role in insulin resistance and type 2 diabetes

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New research in mice suggests that an unusual type of immune cell called " $\gamma\delta$  T cells" may be a new drug and research target for treating or preventing type 2 diabetes caused by obesity. The research report, appearing in the January 2015 issue of the *Journal of Leukocyte Biology*, suggests that  $\gamma\delta$  T cells are necessary for obesity-induced accumulation of macrophages, which are associated with promoting inflammation in fat tissue. This inflammation, which is induced during obesity, is known to be a risk factor for insulin resistance and type 2 diabetes, but its underlying causes have not been clear.

"Results showed that  $\gamma\delta$  T cells contribute to systemic insulin resistance in obese [mice](#), which opens up new avenues for studies in obese humans," said Pooja Mehta, Ph.D., a researcher involved in the work from the Department of Pathology and Immunology at Baylor College of Medicine in Houston, Texas. "This study also provides new information about the complex interplay of immune cells, in the [fat tissue](#), during [obesity](#)."

To make this discovery, scientists used two groups of mice. The first group of mice had an altered gene that caused them to be deficient in  $\gamma\delta$  T cells. The second group was normal. When both groups of mice were fed a Western-type diet rich in saturated fats and sugar to induce obesity, the normal mice showed signs of low-grade inflammation in [adipose tissue](#), liver and skeletal muscle. The mice lacking  $\gamma\delta$  T cells had reduced inflammatory responses in these organs. Furthermore, the [obese mice](#) deficient in  $\gamma\delta$  T cells had reduced systemic insulin resistance as

compared to normal mice.

"Obesity is one of the large public health and growing medical problems in developed countries. The more we learn about obesity, the more we realize that an intimate connection exists between adipose tissue, inflammation and the immune system," said John Wherry, Ph.D., Deputy Editor of the *Journal of Leukocyte Biology*. "These new studies identify a new potentially critical piece of the immune puzzle in the control of the damaging inflammation associated with obesity."

**More information:** Pooja Mehta, Alli Martina Nuotio-Antar, and C. Wayne Smith.  $\gamma\delta$  T cells promote inflammation and insulin resistance during high fat diet-induced obesity in mice. *J. Leukoc. Biol.* January 2015 97:121-134; [DOI: 10.1189/jlb.3A0414-211RR](https://doi.org/10.1189/jlb.3A0414-211RR)

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