

Researchers discover that brown fat protects against diabetes and obesity in humans

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Researchers at the University of Texas Medical Branch at Galveston have shown for the first time that people with higher levels of brown fat, or brown adipose tissue, in their bodies have better blood sugar control, higher insulin sensitivity and a better metabolism for burning fat stores.

Their findings suggest that, because of the brown fat's ability to better regulate [blood sugar](#), this could be a potential medical weapon against diabetes.

"We showed that exposure to mild cold raised whole body [energy expenditure](#), increased glucose removal from the circulation and improved [insulin sensitivity](#) in men who have significant amounts of brown adipose tissue depots," stated UTMB's Labros Sidossis, professor of Internal Medicine, Division of Geriatric Medicine. "These results support the notion that brown [adipose tissue](#) may function as an anti-obesity and anti-diabetic tissue in humans."

People have two types of fat tissue in their bodies: the widely reviled white fat tissue and the less familiar brown fat tissue. One of the many ill health effects of excess white fat tissue is decreased insulin sensitivity, which is a major contributor to diabetes. On the other hand, brown fat has several healthy qualities, including protection against obesity and diabetes.

In their new study appearing in the journal *Diabetes*, Sidossis and his colleagues compared otherwise similar healthy men with either high or

low levels of brown fat tissue on their resting energy expenditure, glucose usage and insulin sensitivity. These men were placed in either normal temperature conditions or were exposed to mildly cold temperatures for five to eight hours.

Throughout the cold or regular temperature exposure period, the team conducted comprehensive analyses of various bodily samples. They collected blood and breath samples to observe changes in glucose and insulin concentrations, hormone changes, whole body oxygen consumption and carbon dioxide production rates. They also aspirated brown and white fat tissue samples to analyze differences in cellular energy production and gene expression.

"In this study we show that, when activated via mild cold exposure, [brown adipose tissue](#) can increase energy expenditure and burn calories. This is good news for overweight and obese people," stated Sidossis. "Of even greater clinical significance may be the finding that brown fat can help the body regulate blood sugar more effectively. This is great news for people with insulin resistance and diabetes and suggests that brown fat may prove to be an important anti-diabetic tissue."

Provided by University of Texas Medical Branch at Galveston

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