Drug boosts fat tissue's calorie-burning ability in lab

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A drug that mimics the activity of thyroid hormone significantly increases the amount of energy burned by fat tissue and promotes weight loss, an animal study of metabolism finds. The results were presented Sunday at The Endocrine Society's 95th Annual Meeting in San Francisco.

Humans and other mammals have two kinds of fat, or adipose, tissue, which are referred to by color: white or brown. White adipose tissue, or WAT, has low energy-burning capacity. Because of this, WAT is associated with weight gain and obesity, as well as other conditions related to metabolism, which is the process that turns food into energy. These conditions include high cholesterol and blood pressure as well as resistance to the hormone insulin. Combined with excess weight, especially around the torso, these conditions comprise a group of diseases collectively called metabolic syndrome. This syndrome is known to increase the risk of developing heart disease and diabetes.

In contrast, brown adipose tissue, or BAT, burns energy at a much faster rate, in a process called thermogenesis. Because of this accelerated energy usage, BAT actually helps protect against obesity, rather than contributing to it like WAT does.

With obesity quickly becoming an international epidemic, medical researchers are trying to find ways to increase the body's own fat-burning ability. One approach is to increase the amount of fat that is turned into energy during thermogenesis. New research conducted last

year in a genetically engineered animal model showed that the activity of white-fat cells could be altered to behave more like brown-fat cells in terms of their fat-burning capabilities. The changes were small, however, so the potential health benefits of this process, aptly termed "beiging," are unclear.

"BAT has the remarkable ability to dissipate excess energy as heat, thus conferring resistance to obesity," said the study's lead author Jean Lin, BS, a graduate research fellow at the Methodist Hospital Research Institute in Houston, TX. "This study has uncovered a new mechanism by which thyroid hormone signaling regulates thermogenesis and metabolic rate and demonstrates the profound therapeutic potential of white fat beiging,"

Lin and her co-investigators examined the beiging effects of the experimental drug called GC-1. In the body, this drug binds to proteins called thyroid hormone receptors, which play a role in turning food into energy when activated by thyroid hormone.

They found that GC-1 increased the metabolism of obese mice by more than 60 percent. Furthermore, this increase in metabolic rate led to significant weight loss within two weeks.

"By inducing thermogenesis in white fat, the compound GC-1 gives fat cells the remarkable ability to dispose of excess calories by converting them to heat instead of storing them as lipid," Lin said.

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