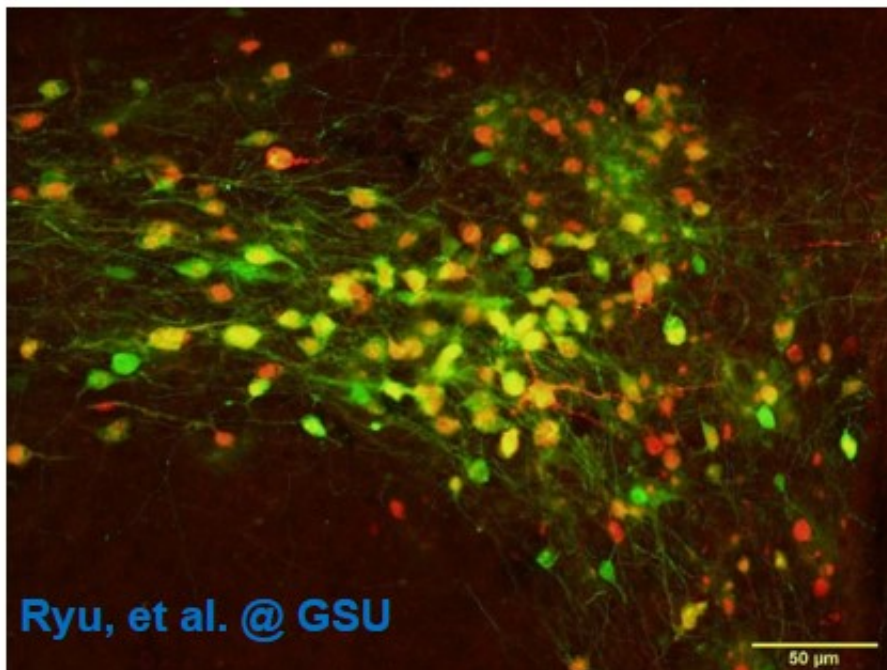


Researchers discover how body's good fat tissue communicates with brain

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A Conversation Taking Place...



Sensory and sympathetic nerves connected to brown fat through the nervous system. Sensory nerves (red/orange) send information from fat to the brain and sympathetic nerves (green/orange) send the signal for fat to be activated or break down. Credit: Georgia State University

Brown fat tissue, the body's "good fat," communicates with the brain through sensory nerves, possibly sharing information that is important for fighting human obesity, such as how much fat we have and how

much fat we've lost, according to researchers at Georgia State University.

The findings, published in *The Journal of Neuroscience*, help to describe the conversation that takes place between the brain and [brown fat](#) tissue while brown fat is generating heat.

Brown fat is considered "good fat" or "healthy fat" because it burns calories to help generate heat for our bodies and expend energy, while [white fat](#) stores energy for later and can increase the risk for health issues, such as diabetes and heart disease. A person with a healthy metabolism has less white fat and an active supply of brown fat.

Studies show that brown fat plays a big role in someone having the capability to burn more energy, becoming a tool to stay trim and fight obesity. Pharmaceutical companies are trying to target brown fat and activate it more, said Johnny Garretson, study author and doctoral student in the Neuroscience Institute and Center for Obesity Reversal at Georgia State.

The study found that when brown fat tissue was activated with a drug that mimics the sympathetic nervous system messages that normally come from the brain, the fat talked back to the brain by activating sensory nerves. The sensory nerves from brown fat increased their activity in response to direct chemical activation and heat generation.

"This is the first time that the function of [sensory nerves](#) from brown fat has been examined," Garretson said. "Brown fat is an active organ that's relatively important for metabolism, and we found a new pathway of its communication.

"The study informs us more about the communication between fat and the brain, which is really beneficial for treating [human obesity](#). There is

evidence that people with more brown fat have a better metabolism, lower instances of type II diabetes and are trimmer. Knowing how to increase the amount of brown fat activity or increase the brown fat, that's the future of trying to figure out yet another way to try and lose weight effectively and quickly."

The researchers speculate that brown fat is telling the brain many things, such as how much heat is being generated, how much and what types of [free energy](#) are being used or stored, how much fat we have and how much fat we've lost.

"As brown fat gets hotter and starts to generate heat, being active and doing good things for our body, it increases our metabolism and helps us burn white fat," Garretson said. "As it's getting hotter, Dr. (Vitaly) Ryu and other members of our lab found that it tells the brain it's getting hotter. We think this is some type of feedback, like a thermostat, and as it gets hotter, it probably controls how the brain is talking back to it."

It was already known the brain communicates with fat tissue by telling it to break down and either release or use free energy for our bodies to function. This study shows a feedback loop between brown [fat tissue](#) and the brain.

The research team has studied the communication from fat to the brain and the brain to fat for years, but they're one of only a few labs in the world to examine communication from fat to the [brain](#) through the nervous system, Garretson said.

Provided by Georgia State University

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