

Brain mechanisms link foods to rising obesity rates

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An editorial authored by University of Cincinnati (UC) diabetes researchers to be published in the Feb. 7, 2012, issue of the journal *Cell Metabolism* sheds light on the biological factors contributing to rising rates of obesity and discusses strategies to reduce body weight.

According to the U.S. Centers for Disease Control, about one-third of U.S. adults are obese, a number that continues to climb.

"While we don't usually think of it this way, body weight is regulated. How much we weigh is influenced by a number of biological systems, and this is part of what makes it so hard for people to lose weight and keep it off," says Randy Seeley, PhD, Donald C. Harrison Endowed Chair, director of the Cincinnati [Diabetes](#) and Obesity Center and author on the paper along with Karen Ryan, PhD, an assistant professor in endocrinology, diabetes and metabolism at UC.

"To understand the obesity epidemic, we must figure out how our environment alters these biological systems to encourage weight gain."

Seeley says a big part of the environment that encourages weight gain is the availability and [consumption](#) of calorically dense, high-fat foods—in particular, what we eat can alter the brain regions that regulate body weight.

"Leptin is a key hormone that is secreted from fat tissue, or adipose tissue, and its main function is to inhibit appetite," Seeley says. "Via a

number of molecular mechanisms, eating a high-fat diet reduces the actions of leptin in the brain. This miscommunication can lead to increased food intake and [weight gain](#)."

"Evolutionary speaking, we are designed to want to eat foods that are high in fat and gain weight because it made it easier to survive times when food was not available," he continues. "However, that is no longer a real concern since food is almost always available, but we still have a biological desire to eat these calorically dense foods. So, how do we intervene and change this drive?"

Seeley says there are several key points in successful therapeutic interventions for the population facing social, financial and health consequences of obesity.

"The key issue is to find ways to take these [biological systems](#) that usually make it hard to lose weight and make them work for us so that it is easier for obese individuals to lose weight," he says. "As we understand the molecular interaction between what we eat and these brain circuits that regulate our body weight, we can design interventions that reduce the [body weight](#) that our bodies defend. This will mean that people trying to lose weight would be able to work with their biology rather than trying to use will power to overcome their biology that pushes them back to their obese state. Such an endeavor will ultimately require a wide range of scientists from different fields to reduce both the human and monetary costs of the [obesity epidemic](#)."

Provided by University of Cincinnati Academic Health Center

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