Obesity research finds leptin hormone isn't the overeating culprit

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Assistant Professor Diego Perez-Tilve

For years, scientists have pointed to leptin resistance as a possible cause of obesity. Research led by investigators at the University of Cincinnati (UC) Metabolic Diseases Institute, however, found that leptin action isn't the culprit.

"Restoring leptin action will not be effective at reducing obesity because leptin action is normal as opposed to being impaired in obesity," says assistant professor Diego Perez-Tilve, PhD, who directed the study "Diet-Induced Obese Mice Retain Endogenous Leptin Action" which appeared in the science journal *Cell Metabolism* on May 14, 2015.

Leptin is a hormone that plays a role in appetite and weight control. It is produced, Perez-Tilve says, when we are well fed, and it signals to the brain that there is ample energy and therefore reduces eating.

Leptin has been a hormone of interest since 1994, he says, when scientists discovered that a particular strain of obese mouse couldn't produce leptin at all.

"That mouse was very obese because it was hungry all the time. When they treated the mouse withleptin, it stopped eating so much and started losing weight."

Perez-Tilve says scientists were initially puzzled because obese persons have leptin levels far higher than persons of average weight. They theorized that the body was making extra leptin to combat obesity and that the obese patients must therefore need more leptin than persons of average weight to signal the brain to stop eating. However, in human preclinical trials, "giving obese patients more leptin didn't work … they ate the same and remained obese, so it was concluded that obesity was a state of leptin resistance," he says.

In the UC study, funded by the National Institutes of Health, the team headed by Perez-Tilve took a different approach. They blocked leptin action in both lean and obese mice. The results were that both sets of mice ate more and gained weight to the same extent, proving that "leptin action was not impaired in the obese mouse."

With obesity affecting more than one-third of Americans and taking a toll on the nation's health care system, Perez-Tilve says the results of this study show "we need to change our way of thinking about how to use leptin as a potential target for therapy to treat obesity."

Provided by University of Cincinnati