

Scientists uncover new role for gene in maintaining steady weight

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Against the backdrop of the growing epidemic of obesity in the United States, scientists from the Florida campus of The Scripps Research Institute have made an important new discovery regarding a specific gene that plays an important role in keeping a steady balance between our food intake and energy expenditure. The study may help scientists better understand the keys to fighting obesity and related disorders such as diabetes.

The study, which was published in the November 25, 2011 print edition of *The [Journal of Biological Chemistry](#)*, focused on the melanocortin-3 receptor (MC3R), which normally responds to signals of nutrient intake.

"What we discovered was quite a surprise," said Scripps Research Associate Professor Andrew Butler, who led the study. "We thought that the actions of the receptor expressed in the brain would be critical for metabolic homeostasis. However, what we found is that actions of the receptor expressed outside the brain appear to be equally important."

The existence of [drug targets](#) in areas outside of the [central nervous system](#) (the body's "periphery") might help in the effort to develop drugs that influence metabolism without major side effects, Butler said.

The findings were made possible by the team's development of a new transgenic animal model, where expression of the MC3R gene can be selectively "switched on" in different cell types.

In the study, the suppression of MC3R expression in the brain and peripheral tissues had a marked impact on metabolic homeostasis (equilibrium). Interestingly, mice expressing the MC3R gene in the brain only displayed an obese phenotype ([physical appearance](#)) similar to those where all types of expression was suppressed, indicating that actions of this receptor in the brain are not sufficient to protect against weight gain. The finding that loss of MC3R activity in the periphery impairs metabolic homeostasis is startling, Butler said, and point to a distinct role for MC3R signaling in the [peripheral tissues](#). However, how the actions of these receptors impacts on obesity remains to be determined.

"It's clear that these peripheral receptors are important and the new mouse model will let us explore that potential," Butler said.

More information: "Genetic dissection of melanocortin-3 receptor function suggests roles for central and peripheral receptors in energy homeostasis," [www.jbc.org/content/early/2011 ... M111.278374.abstract](http://www.jbc.org/content/early/2011/11/11/111.278374.abstract)

Provided by The Scripps Research Institute

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