

# Scientists highlight link between stress and appetite

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(Medical Xpress) -- Researchers in the Hotchkiss Brain Institute (HBI) at the University of Calgary's Faculty of Medicine have uncovered a mechanism by which stress increases food drive in rats. This new discovery, published online this week in the journal *Neuron*, could provide important insight into why stress is thought to be one of the underlying contributors to obesity.

Normally, the brain produces neurotransmitters (chemicals responsible for how cells communicate in the brain) called endocannabinoids that send signals to control appetite. In this study, the researchers found that when food is not present, a stress response occurs that temporarily causes a functional re-wiring in the brain. This re-wiring may impair the endocannabinoids' ability to regulate food intake and could contribute to enhanced food drive.

The researchers also discovered that when they blocked the effects of stress hormones in the brain, the absence of food caused no change in the neural circuitry.

Researchers Jaideep Bains, Ph.D. and Quentin Pittman, Ph.D., looked specifically at nerve cells (neurons) in the region of the brain called the hypothalamus. This structure is known to have an important role in the control of appetite and metabolism and has been identified as the primary region responsible for the brain's response to stress.

Bains explains, "These findings could help explain how the cellular

communication in our brains may be overridden in the absence of food. Interestingly, these changes are driven not necessarily by the lack of nutrients, but rather by the stress induced by the lack of food."

If similar changes occur in the human brain, these findings might have several implications for human health.

"For example, if we elect to pass over a meal, the brain appears to simply increase the drive in pathways leading to increased appetite," explains Pittman. "Furthermore, the fact that the lack of food causes activation of the stress response might help explain the relationship between stress and obesity."

These results lay the foundation for future studies to investigate the use of therapies that affect these systems in order to manipulate food intake. They also open the door to studies looking at whether or not the stress brought about by lack of food affects other systems where endocannabinoids are known to play a role.

"One thing we can say for sure, is that this research highlights the importance of food availability to our nervous system. The absence of food clearly brings about dramatic changes in the way our neurons communicate with each other," says Pittman.

Provided by University of Calgary

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