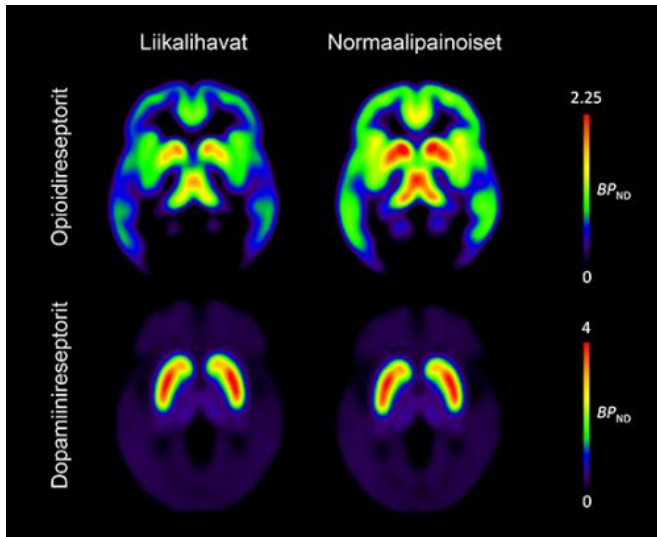


# Obesity associated with brain's neurotransmitters

4 March 2015



Obesity is associated with lowered opioid receptor availability (top row) whereas availability of dopamine receptors remains unchanged. Brains in the left column belong to obese people and brains in the right column to normal-weight people. Credit: Aalto University

Researchers at Aalto University and University of Turku have revealed how obesity is associated with altered opioid neurotransmission in the brain.

New research reveals how [obesity](#) is associated with altered functioning of brain's opioid system, which is intimately involved in generating pleasurable sensations. Researchers found that obesity was associated with significantly lowered number of opioid receptors in the brain. However, no changes were observed in the dopamine neurotransmitter system, which regulates motivational aspects of eating.

Obesity is a great challenge to human health worldwide because it is associated with serious medical conditions such as type 2 diabetes, [coronary heart disease](#), and stroke. Even though it

is well known that unhealthy eating habits are the major cause for obesity, people have often problems with restraining their eating.

Our findings highlight how obesity is associated with brain-level molecular changes. It is possible that the lack of brain's [opioid receptors](#) predisposes the obese individuals to overeating to compensate decreased hedonic responses in this system, tell professor Lauri Nummenmaa and researcher Henry Karlsson.

The findings have major implications for our understanding of the causes of obesity. They help us to understand the mechanisms involved in overeating, and provide new insight into behavioural and pharmacological treatment and prevention of obesity. However, we do not yet know whether the altered brain neurochemistry is a cause or consequence of obesity.

The researchers measured availability of mu-opioid and type 2 dopamine receptors in normal-weight and [obese individuals](#)' brains using [positron emission tomography](#) at the Turku PET Centre.

The findings were published on March 3, 2015 in the scientific journal *The Journal of Neuroscience*.

Provided by Aalto University

APA citation: Obesity associated with brain's neurotransmitters (2015, March 4) retrieved 1 May 2021 from <https://medicalxpress.com/news/2015-03-obesity-brain-neurotransmitters.html>

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