

Excess weight linked to brain changes that may relate to memory, emotions, and appetite

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Being overweight appears related to reduced levels of a molecule that reflects brain cell health in the hippocampus, a part of the brain involved in memory, learning, and emotions, and likely also involved in appetite control, according to a study performed by researchers at SUNY Downstate Medical Center and other institutions. The results of the study were published in *Neuroimage: Clinical*.

Jeremy D. Coplan, MD, professor of psychiatry at SUNY Downstate, led a multicenter team that visualized the molecule, N-acetyl-aspartate (NAA), using [magnetic resonance spectroscopy](#), a non-invasive magnetic resonance imaging (MRI) application. NAA is associated with brain cell health. Overweight study participants exhibited lower levels of NAA in the [hippocampus](#) than normal weight subjects. The effect was independent of age, sex, and psychiatric diagnoses.

The importance of the hippocampus – a seahorse-shaped organ deep within the brain – to the formation and preservation of memory and to emotional control is well known, Dr. Coplan notes, but its role in [appetite control](#) is less established.

"The relevance of the finding is that being [overweight](#) is associated with specific changes in a part of the brain that is crucial to memory formation and emotions, and probably to appetite," said Dr. Coplan. The study is believed to be the first human research documenting the association of NAA with body weight.

"Whether low NAA is a consequence of being overweight, causes being overweight, or a combination of both remains to be determined," Dr. Coplan added. "Future studies are planned to focus on whether weight loss leads to an increase

in NAA."

"We also found that high worry also produced low levels of NAA in the hippocampus, but was not associated with a high [body mass index](#) (BMI)," Dr. Coplan said. Dr. Coplan and his team looked at persons with a BMI equal to or greater than 25. Normal weight is defined as a BMI of 18.5-24.9, overweight between 25 and 29.9, and obesity at a BMI of 30 or greater.

More information: Dr. Coplan's article, "Reduced Hippocampal N-acetyl-aspartate (NAA) as a Biomarker for Overweight," is available online at: www.sciencedirect.com/science/.../S2213158213001733

Provided by SUNY Downstate Medical Center

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