

Brain stress factor regulates obesity

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Autophagy is like the garbage disposal program of a cell, through which it disposes unusable material. Credit: Pixabay_Hans

For the first time, the Max Planck Institute of Psychiatry and the University Hospital Bonn have been able to directly link a stress factor in

the brain to the cell's recycling system and obesity. This could enable a completely new approach to treat stress-induced metabolic diseases.

Researchers have long known that the protein FKBP51 is associated with depression and anxiety disorders. FKBP51 is involved in the regulation of the stress response system—if this is disturbed, [mental illnesses](#) can develop. The researchers at the Max Planck Institute (MPI) of Psychiatry and the University Hospital Bonn (UKB) have now discovered a surprising new role for this protein: it acts as a molecular link between the stress response system and [metabolic processes](#) in the body. The central mechanism is autophagy, the cellular waste recycling process.

"Autophagy is the cell's recycling program, which gets rid of old or damaged proteins. As such, it can counteract aging processes and—as we have now been able to show—reduce obesity," explains Nils Gassen, Head of the Neurohomeostasis Research Group at the UKB, one of the project leaders.

Mathias Schmidt, Research Group Leader at the MPI of Psychiatry, adds: "The fact that the stress factor FKBP51 in the brain is a master regulator of autophagy and thus [obesity](#) reveals a number of new intervention possibilities, from pharmacological manipulation of FKBP51 to autophagy-inducing fasting diets or sports programs."

Stress resilience for everyone

The possibilities opened up by the new findings are very diverse. Especially now, with the ongoing worldwide pandemic, it becomes clear how uncontrollable stress can affect our psyche and our body. Processes such as autophagy can be positively influenced by an [active lifestyle](#) and a healthy diet. Gassen and Schmidt are therefore planning further collaborations intended to provide concrete data on how each individual

can increase their [autophagy](#) and thus their individual stress resilience.

More information: Alexander S. Häusl et al, Mediobasal hypothalamic FKBP51 acts as a molecular switch linking autophagy to whole-body metabolism, *Science Advances* (2022). [DOI: 10.1126/sciadv.abi4797](#)

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