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Gut microbiota found to play a pivotal role in disordered eating tied to repeated dieting

For the first time, the gut microbiota has been shown to play a pivotal role in the risk of disordered eating behaviour stemming from yo-yo dieting. Researchers from INRAE, CNRS, the University of Rennes and the Université Bourgogne Europe conducted a preclinical study showing that repeated dieting leads to binge-eating behaviour, which can be passed on directly by the microbiota. The results were published in *Advanced Science*.

An estimated 42% of adults in Western countries[1] have tried low-calorie diets in an attempt to lose weight. Repeated dieting – where a person alternates between restricting and then increasing their calorie intake – can have a yo-yo effect, with the person gaining more weight than they lost in the first place. This pattern of restriction deregulates eating behaviour, leading to issues such as binge eating, where a person compulsively consumes a large amount of food in a short period of time.

Researchers from INRAE, CNRS, the University of Rennes and Université Bourgogne Europe took a closer look at the microbiota to understand its involvement in the deregulation of eating behaviour.

Based on a study in mice, the research team showed that alternating between a standard diet and one high in fat and sugar caused the animals' weight to yo-yo and led them to binge on fatty and sugary foods.

Faecal sample analysis showed changes in the microbiota of the binge-eating mice. The researchers then transferred this altered microbiota into healthy mice. These mice then also developed the same compulsive eating behaviour towards the high-fat and high-sugar foods, which shows the role the gut microbiota plays in eating behaviour deregulation.

Changes were even visible in the animals' brains, with increased expression of the genes related to the reward system, an area of the brain involved in food liking. Cellular-level changes were identified in the brain stem, which is where information from the gut is integrated.

These findings confirm the potentially harmful health effects of repeated dieting and underscore the need to consider the gut microbiota when patients seek medical support in their weight-loss efforts. To confirm the potential applications of these initial results, complementary studies in humans will be necessary, such as surveys and microbiota analyses of people who have experienced these types of yo-yo effects.

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[1] Santos I., Sniehotta F. F., Marques M. M., Carraça et al. (2017). Prevalence of personal weight control attempts in adults: a systematic review and meta-analysis. *Obesity Reviews*, 18, 32–50. doi: 10.1111/obr.12466.

Reference

Fouesnard M., Salin A., Ribes S. et al. (2025). Weight cycling deregulates eating behavior in mice via the induction of durable gut dysbiosis. *Advanced Science,* DOI: http://doi.org/10.1002/advs.202501214

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