

OBESITY

Gut microbiome and serum metabolome changes

Although the gut microbiota is thought to be involved in the development of obesity, the exact nature of this relationship is unclear. New research in a cohort of Han Chinese individuals has revealed specific alterations in the gut microbial species present in people with obesity, as well as changes in amino acid profiles.

“As the gut microbiota varies with age, ethnicity and diet, studies in a young Chinese population might provide additional valuable information on the gut microbiota and obesity, especially by linking information on the gut microbiome with blood metabolite data,” explains one of the corresponding authors Guang Ning. “Hence, we performed this study to uncover the links between the gut microbiota, blood metabolites and obesity.”

Shotgun sequencing analysis of faecal samples from young individuals revealed that those with obesity had reduced bacterial diversity and gene count compared with control lean individuals. In particular, *Bacteroides thetaiotaomicron*, which is usually highly enriched, was depleted in the samples from participants with obesity. Next, the researchers performed non-targeted metabolomics profiling on serum samples from the participants, which demonstrated that those with obesity had a very different metabolic profile to those who were lean. The levels of 20 of 34 amino acids were substantially different in the two groups. Interestingly, these changes were partially normalized in patients with obesity who had undergone sleeve gastrectomy.

Gavage of mice fed a normal chow diet with *B. thetaiotaomicron* resulted in reduced total and inguinal fat mass, as well as increased lean mass. When mice fed a high-fat diet were gavaged with *B. thetaiotaomicron*, weight gain and adiposity were alleviated. These findings suggest that *B. thetaiotaomicron* could protect against obesity in mice.

The researchers are planning additional studies to further elucidate the role of *B. thetaiotaomicron*. “We are also planning to explore the interactive effects of genetics and gut microbiota on the development of obesity,” says Ning.

Claire Greenhill

ORIGINAL ARTICLE Liu, R. et al. Gut microbiome and serum metabolome alterations in obesity and after weight-loss intervention. *Nat. Med.* <http://dx.doi.org/10.1038/nm.4358> (2017)