

GUT

Gut microbe may be key to metabolic health and leanness in overweight/obesity

Abundance of Akkermansia muciniphila linked to lower glucose, blood fats, and healthier body fat distribution

The gut microbe *Akkermansia muciniphila* may hold the key to better metabolic health and healthier body fat distribution in people who are overweight or obese, reveals a small study published online in the journal **Gut**.

The microbe seems to be linked to lower levels of fasting blood glucose and fats—key factors involved in the development of diabetes and heart disease—and healthier distribution of body fat, the findings indicate.

In healthy people *A muciniphila* makes up around 3-5% of the gut's bacterial ecosystem and is associated with a diet rich in insoluble fibre.

The evidence to date suggests that a wide range of gut microbes and the chemical processes that sustain life—metabolism—have an important role in the development of obesity and potentially harmful metabolic disorders.

A muciniphila has already been linked to healthier glucose metabolism and leanness in mice, but it has not been clear whether this also applies to people.

The researchers therefore wanted to find out if the microbe was linked to bacterial diversity in the gut and a lower health risk profile in people who were overweight/obese.

They assessed levels of gut *A muciniphila* and other bacteria, as well as fasting blood glucose and blood fats, and indicators of body fat distribution—waist:hip ratio and the amount of fat beneath the skin—in 49 obese or overweight adults.

These assessments were made before and after a dietary intervention: 6 weeks of a low calorie diet with extra protein and fibre followed by 6 weeks of a stabilisation diet. Calorie restriction is known to alter the composition of gut bacteria.

They found that at the start of the dietary intervention, those with evidence of abundant *A muciniphila* in their guts had lower fasting blood glucose and insulin levels, a smaller waist:hip ratio, and a smaller fat cell volume beneath their skin than those with low levels of the microbe.

Those who had abundant *A muciniphila* as well as a greater diversity of microbes in their gut to start with, had the healthiest metabolic profile—particularly for fasting blood glucose, triglycerides (blood fats), and body fat distribution.

After 6 weeks of calorie restriction, those with a greater abundance of *A muciniphila* to start with showed stronger improvement in their metabolic profile and body fat distribution than those with lower levels.

Calorie restriction was associated with a reduction in the abundance of *A muciniphila* across the board, but these levels still remained 100 times higher in people in whom the microbe was more abundant to start with.

The researchers suggest that the by-products of *A muciniphila* may act as a fuel for other beneficial gut bacteria.

"*A muciniphila* produces a variety of fermentation products," they write. "These may serve as energy sources for other bacteria and the host. It is possible that through this cross-feeding, *A muciniphila* may contribute to the expansion of other beneficial species, while it may itself have a direct effect on host metabolism, consistent with rodent studies," they add.

The researchers conclude that *A muciniphila* warrants further investigation to see whether it could have some potential as a treatment for insulin resistance—the precursor to type 2 diabetes—and whether it might be used as an indicator of the likely success of dietary interventions.