

Researchers identify a mechanism linking bariatric surgery to health benefits

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Bariatric surgery has positive effects not only on weight loss but also on diabetes and heart disease. Researchers at the Sahlgrenska Academy and University of Cincinnati have shown that the health benefits are not caused by a reduction in the stomach size but by increased levels of bile acids in the blood. These findings, reported in *Nature*, indicate that bile acids could be a new target for treating obesity and diabetes.

Previous research from the Sahlgrenska Academy has demonstrated that [obesity surgery](#) is the only effective treatment for obesity and obesity-related diabetes.

However, the mechanisms that cause the positive effects have been unclear.

Positive effects caused by bile acids

Professor Fredrik Bäckhed, in collaboration with Randy Seeley and coworkers from the University of Cincinnati in the US, has shown that the positive effects of [bariatric surgery](#) are likely caused by the surgery-induced increase in [bile acids](#). The study, which is published online in the leading science journal *Nature*, focuses on a specific receptor called FXR, which is involved in bile acid signaling.

"Our study shows that signaling through FXR is essential for the beneficial effects of the surgery to be achieved. This is a major

breakthrough in understanding how bariatric surgery affects metabolism and in the development of new [treatment strategies](#)", says Fredrik Bäckhed.

Important future complement

The prevalence of obesity is increasing worldwide and it is not realistic to operate on all obese subjects. Furthermore, bariatric surgery is associated with a risk of complications. Treatment strategies based on the FXR receptor could therefore be an important future therapeutic approach.

Improves glucose metabolism

In this study, mice with or without the FXR gene underwent an operation termed vertical sleeve gastrectomy (VSG) in which approximately 80 percent of the stomach was removed. The surgical procedure is the same as that performed in humans.

The researchers observed that the operation promoted [weight loss](#) and improved [glucose metabolism](#) in mice with FXR while the operation had no effect in mice that lacked FXR.

Alters intestinal bacterial flora

This study also showed that VSG resulted in changes in the gut microbiota, a potentially important finding given that Fredrik Bäckhed's research group has previously demonstrated that the intestinal bacterial flora is altered in obesity and diabetes.

"These additional findings suggest that an altered gut flora together with signaling through FXR may contribute to improved metabolism. This

means that future treatments based on the intestinal flora could help in the treatment of diabetes."

More information: The article FXR is a molecular target for the effects of vertical sleeve gastrectomy was published online in *Nature* on 26 March. Link: [www.nature.com/nature/journal/ ... ull/nature13135.html](http://www.nature.com/nature/journal/full/nature13135.html)

Provided by University of Gothenburg

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