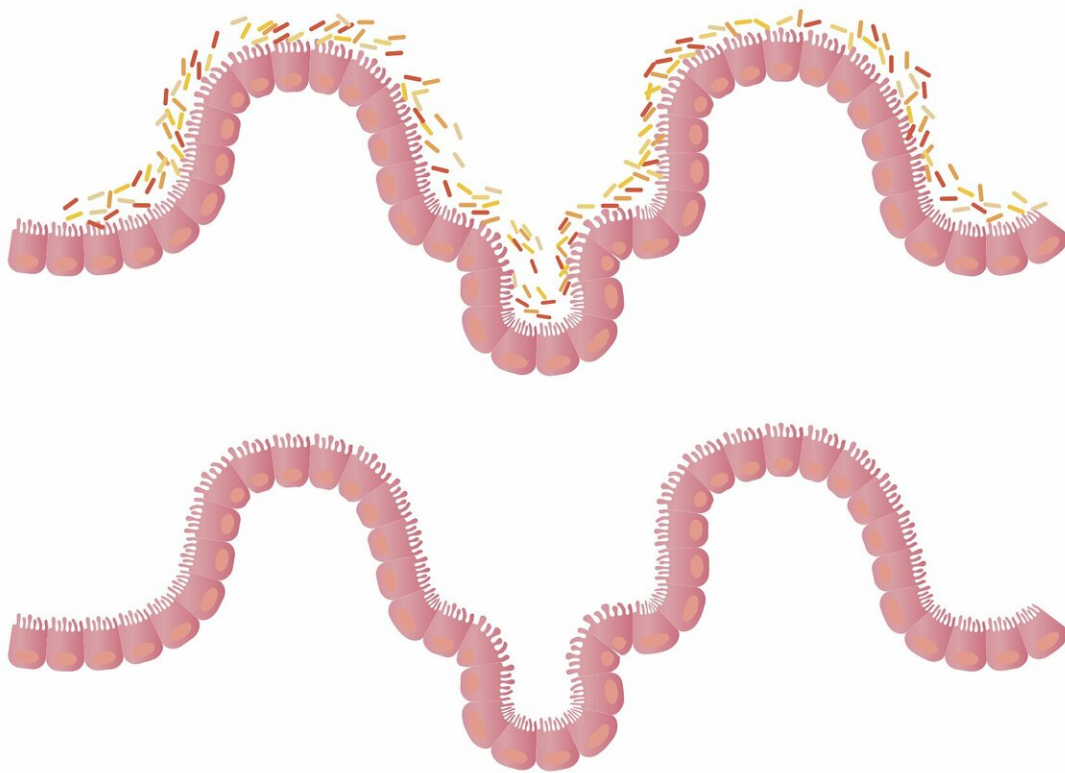# Gut microbiota provide clues for treating diabetes

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The individual mix of microorganisms in the human gastrointestinal tract

provides vital clues as to how any future incidence of type 2 diabetes can be predicted, prevented and treated. This is demonstrated in a population study led from the University of Gothenburg.

That a person's gut microbiota can contribute to type 2 [diabetes](#) has been shown in previous research, led by Fredrik Bäckhed, Professor of Molecular Medicine at Sahlgrenska Academy, University of Gothenburg.

The present study, now published in the journal *Cell Metabolism*, describes newly discovered clues in the microbiota to how bacteria may contribute to type 2 diabetes and potentially predict who will develop disease based individual's gut microbiota.

By studying people who have not yet developed type 2 diabetes, the researchers were able to rule out the possibility that the gut microbiota was affected by the disease or its treatment. The majority of previous studies in this field have compared healthy individuals with patients.

Altered composition

What has emerged is that in individuals with raised fasting blood glucose levels or reduced glucose tolerance, a condition known as prediabetes, as well as in people with untreated type 2 diabetes, the gut microbiota is changed. Accordingly, the findings show that the gut microbiota can be used to identify individuals with diabetes.

The study also shows that, in the gut microbiota of study participants with prediabetes or who had developed type 2 diabetes, the potential to produce butyrate (a fatty acid that promotes hormone production in the [gastrointestinal tract](#) and controls inflammation) was reduced. This substance is formed mainly by beneficial bacteria in intestines as they digest dietary fibers. One possible implication is that altering individuals

fiber intake and perhaps matching fiber types to specific microbiota, or development of next generation probiotics to add missing bacteria, may enable the development of novel diabetes prevention or therapeutics.

"Our study shows clearly that the composition of the gut microbiota may have a great potential for helping us to understand the risks of developing type 2 diabetes, and therefore improve our chances of detecting, preventing and treating the disease," Bäckhed says.

Prevention at individual level

The results confirm the picture that the gut microbiota interacts with the body's functions and internal conditions. The intestinal tract contains more than a kilogram of bacteria that are important for our health, and the kinds of gut bacteria found in people with type 2 diabetes seem to differ from those in healthy people.

"We hope to find patterns and identify which components of the gut microbiota identify individuals whose risk of developing type 2 diabetes is elevated. In the future, perhaps we'll be able to prescribe individualized dietary changes, or develop new types of probiotic that can prevent or perhaps even treat the disease," Bäckhed says.

The research now published builds on a population-based study that has been underway at the University of Gothenburg and Sahlgrenska University Hospital since 2013. It covered some 5,000 randomly selected people who were invited to take part in the study, and its purpose was to investigate which factors may entail an increased risk of type 2 diabetes. To confirm and verify the findings, the researchers also analyzed samples collected from the Swedish Cardiopulmonary Bioimage Study (SCAPIS), a nation-wide population study.

 More information: Hao Wu et al. The Gut Microbiota in Prediabetes

Provided by University of Gothenburg