

# One in four has alarmingly few intestinal bacteria

August 28 2013

---

All people have trillions of bacteria living in their intestines. If you place them on a scale, they weigh around 1.5 kg. Previously, a major part of these 'blind passengers' were unknown, as they are difficult or impossible to grow in laboratories. But over the past five years, an EU research team, MetaHIT, coordinated by Professor S. Dusko Ehrlich at the INRA Research Centre of Jouy-en-Josas, France and with experts from Europe and China have used advanced DNA analysis and bioinformatics methods to map human intestinal bacteria.

"The [genetic analysis](#) of intestinal bacteria from 292 Danes shows that about a quarter of us have up to 40% less [gut bacteria](#) genes and correspondingly fewer bacteria than average. Not only has this quarter fewer intestinal bacteria, but they also have reduced [bacterial diversity](#) and they harbour more bacteria causing a low-grade inflammation of the body. This is a representative study sample, and the study results can therefore be generalised to people in the Western world," says Oluf Pedersen, Professor and Scientific Director at the Faculty of Health and Medical Sciences, University of Copenhagen.

Oluf Pedersen and Professor Torben Hansen have headed the Danish part of the MetaHIT project, and the findings are reported in the scientific journal *Nature*.

## The gut is like a rainforest

Oluf Pedersen compares the [human gut](#) and its bacteria with a tropical rainforest. He explains that we need as much diversity as possible, and – as is the case with the natural [tropical rainforests](#) – decreasing diversity is a cause for concern. It appears that the richer and more diverse the composition of our intestinal bacteria, the stronger our health. The bacteria produce vital vitamins, mature and strengthen our immune system and communicate with the many [nerve cells](#) and hormone-producing cells in the intestinal system. And, not least, the bacteria produce a wealth of bioactive substances which penetrate into the bloodstream and affect our biology in countless ways.

"Our study shows that people having few and less diverse intestinal bacteria are more obese than the rest. They have a preponderance of bacteria which exhibit the potential to cause mild inflammation in the digestive tract and in the entire body, which is reflected in blood samples that reveal a state of chronic inflammation, which we know from other studies to affect metabolism and increase the risk of type 2 diabetes and cardiovascular diseases," says Oluf Pedersen.

"And we also see that if you belong to the group with less intestinal bacteria and have already developed obesity, you will also gain more weight over a number of years. We don't know what came first, the chicken or the egg, but one thing is certain: it is a vicious circle that poses a health threat," says the researcher.

## **Take care of your intestinal bacteria**

The researchers thus still cannot explain why some people have fewer intestinal bacteria, but the researchers are focusing their attention at dietary components, genetic variation in the human host, exposure to antimicrobial agents during early childhood and the chemistry we encounter daily in the form of preservatives and disinfectants.

A French research team reports a study in the same issue of *Nature* showing that by maintaining a low-fat diet for just six weeks, a group of overweight individuals with fewer and less diverse intestinal bacteria may, to some extent, increase the growth of intestinal bacteria, both in terms of actual numbers and diversity.

"This indicates that you can repair some of the damage to your gut bacteria simply by changing your dietary habits. Our intestinal bacteria are actually to be considered an organ just like our heart and brain, and the presence of health-promoting bacteria must therefore be cared for in the best way possible. Over the next years, we will be gathering more knowledge of how best to do this," says Oluf Pedersen, whose research team is studying, among other things, the impact of dietary gluten on gut bacteria composition and gut function.

## **Towards innovative early diagnostics and treatment options**

Obesity and type 2 diabetes are not just a result of unfortunate combinations of intestinal bacteria or lack of health-promoting [intestinal bacteria](#), Oluf Pedersen emphasises. There are likely many causal factors at play. But the MetaHit researchers' contribution opens a new universe in which we begin to understand how gut bacteria in direct contact with the surrounding environment have a decisive impact on our health and risk of disease.

"At present we cannot do anything about our own DNA, individual variation in which also plays a crucial role in susceptibility for lifestyle diseases. But thanks to the new gut microbiota research, we now can start exploring interactions between host genetics and the gut bacteria-related environment which we may be able to change. That is why it is so exciting for us scientist within this research field– the possibilities are

huge," says Oluf Pedersen.

"The long-term dream is to map and characterize any naturally occurring gut bacteria that produce appetite-inhibiting bioactive substances and in this way learn to exploit the body's own medicine to prevent the obesity epidemic and type 2 diabetes," says Oluf Pedersen.

**More information:** [dx.doi.org/10.1038/nature12506](https://doi.org/10.1038/nature12506)  
[dx.doi.org/10.1038/nature12480](https://doi.org/10.1038/nature12480)

Provided by University of Copenhagen

Citation: One in four has alarmingly few intestinal bacteria (2013, August 28) retrieved 26 April 2024 from <https://medicalxpress.com/news/2013-08-alarmingly-intestinal-bacteria.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.