Medical Xpress

A new bacteria, made in Belgium

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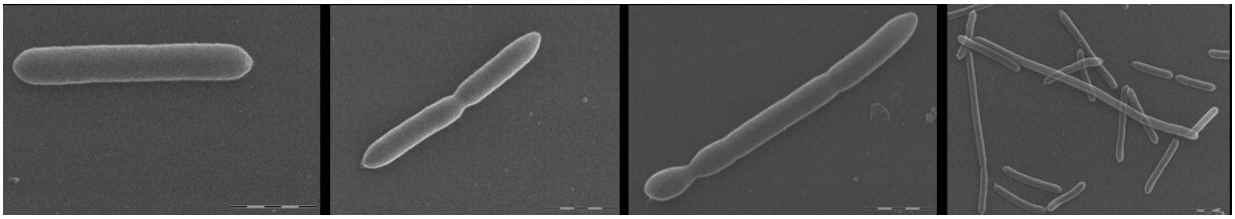

Researchers from University of Louvain (UCLouvain) have discovered a new bacterium in the human intestine, they called Dysosmobacter welbionis. The UCLouvain scientists have also discovered positive effects of this bacterium on type 2 diabetes, obesity and inflammation. Credit: UCLouvain

Researchers led by Patrice Cani, FNRS researcher at University of Louvain (UCLouvain) have studied a bacterium called Subdoligranulum that is almost absent in obese and diabetic people, while systematically present in healthy people. There is as yet only one cultivated strain of this bacterial family available in the world (the only known member of a large family), but unfortunately, it is not the strain that was observed to be decreased in sick people. This is not unusual: Nearly 70% of bacteria in the intestine have not yet been identified (this is called the dark matter of the intestine).

In 2015, the team then set out to isolate the bacterium themselves in order to learn about its action on the human body, knowing that it is only present in healthy people. For two years, the scientists searched, isolated and cultivated nearly 600 bacteria from the intestine in an attempt to

find a second member of the family, without success. Instead, the UCLouvain team uncovered a previously unknown bacterium. This achievement is already extraordinary in itself: Few scientists have the opportunity in their careers to discover a new genus of bacteria. Due to its odor, the researchers named it Dysosmobacter welbionis: Dysosmo ("That which smells bad" in Greek), bacter (bacterium) and Welbionis for WELBIO, the organization in the Walloon region which funded this research.

The peculiarity of this bacterium? To begin with, it produces butyrate; many other bacteria produce this molecule, which is known to decrease the risk of colon cancer, for example, by strengthening the intestinal barrier and boosting immunity. But the team also observed that Dysosmobacter welbionis was less present in people with type 2 diabetes.

Through the analysis of 12,000 fecal samples (microbiota) from around the world (i.e., a very representative population sample), the UCLouvain scientists observed that the bacteria is present in 70% of the population. So why has it never been discovered before? Part of the answer probably lies in the improved cultivation techniques developed by the UCLouvain team.

The UCLouvain team including Emilie Moens de Hase (doctoral student) and Tiphaine Le Roy (post-doctoral fellow) then tested the action of Dysosmobacter welbionis in mice. The bacteria increased the number of mitochondria, thereby lowering sugar levels and weight, in addition to exerting strong anti-inflammatory effects. All these effects are very promising for type 2 diabetic and obese subjects and resemble those of Akkermansia, a beneficial bacterium that is at the heart of the research in Patrice Cani's lab.

Additionally the bacteria's effects are not limited to the gut: Scientists

have found that certain molecules produced by Dysosmobacter migrate around the body and have distant effects, as well. This is promising, and probably explains the effects of the bacteria on the fat tissue, but also opens the doors for a possible impact on other diseases such as inflammation and cancer. This is currently being investigated by the team.

The next step is to test the action of Dysosmobacter welbionis coupled with that of Akkermansia in order to see if their association allows cumulate effects on health to observe possible benefits for type 2 diabetes, inflammatory diseases, obesity and cancer. "That's the fun of research: You dig for dinosaur bones and you end up finding a treasure," says Patrice Cani.

The research results are published in the journal *Gut*.

More information: Tiphaine Le Roy et al, Dysosmobacter welbionis is a newly isolated human commensal bacterium preventing diet-induced obesity and metabolic disorders in mice, *Gut* (2021). DOI: 10.1136/GUTJNL-2020-323778

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