

University of Louvain research in world premiere

A bacteria likely to reduce the cardiovascular risks of 1 in 2 people

NB : Do not use UCL anymore, but UCLouvain (the name "UCL" disappeared in September 2018)

IN BRIEF:

- Patrice Cani, professor at University of Louvain (UCLouvain), and his team conducted the **first pilot study in humans to observe the impact of the bacteria *Akkermansia*** (ingestion for 3 months), particularly on the **reduction of cardiovascular risk factors**. The results are published in the scientific journal *Nature Medicine*.
- **Promising results:** the bacterium significantly **limits** the increase of several **risk factors for cardiovascular diseases**, moderates the progression of **pre-diabetes** and reduces **cholesterol levels** in humans.
- A **major discovery** since today, one in two individuals is overweight and has several cardiovascular risk factors.
- The **next step?** The UCLouvain researchers are planning larger-scale tests and the commercialization of the bacteria in the form of food supplements.

PRESS CONTACT:

Patrice Cani, Head Researcher at the Louvain Drug Research Institute of the UCLouvain, Senior Research Associate FNRS: +32 2 764 73 97, **+32 474 900 562**, patrice.cani@uclouvain.be

In 2007, **Patrice Cani** (FNRS-WELBIO researcher) and his team at the Louvain Drug Research Institute of University of Louvain, in close collaboration with **Willem de Vos**, professor at UWageningen, discovered the beneficial effects of an **intestinal bacteria, *Akkermansia muciniphila***¹, able to **moderate the development of obesity and type 2 diabetes**, in mice. In 2017, the team discovered (still in the mouse) that the use of a **pasteurized form of *Akkermansia* leads to an even greater protection** than the living bacterium **regarding various cardiovascular disease risk factors** such as insulin resistance, hypercholesterolemia, or the storage of fat in adipose tissue.

Following these discoveries, the UCLouvain team, in collaboration with the Cliniques universitaires Saint-Luc², developed a **clinical study in order to administer the bacteria to humans**. For this, it was necessary to develop the capacity to produce the bacterium in large quantity and to make sure that the tests would be without risk for the participants.

The UCLouvain researchers administered *Akkermansia* to overweight or obese volunteers, all **displaying insulin resistance (pre-diabetes type 2) and metabolic syndrome**, in other words, having several elevated risk factors for cardiovascular diseases. The volunteers were randomly divided into **3 groups** (placebo, live bacteria and pasteurized bacteria) and were asked not to change their dietary habits or their physical activity. *Akkermansia* was provided as a **nutritional supplement**.

The primary goal of this UCLouvain study was to **demonstrate the feasibility of daily ingesting *Akkermansia* for 3 months, without risk**. Clara Depommier and Amandine Everard, UCLouvain researchers, observed excellent compliance (the supplements were easy to ingest) and tolerance (there were no side effects) in the groups taking live or pasteurized bacteria.

¹ Bacteria naturally present in large quantities in healthy people

² Prof. Jean-Paul Thissen, Prof. Michel Hermans, Prof. Dominique Maiter, Dr. Audrey Loumaye

The **conclusions** are clear: **the tests in humans confirm what had already been observed in mice**. Ingestion of **the (pasteurized) bacterium prevented the deterioration of the health status** of the subjects (pre-diabetes, cardiovascular risks). Even better, the researchers observed a **decrease in inflammation markers in the liver**, a slight decrease in the body weight of the subjects (2.3 kg on average)³ as well as a lowering of **cholesterol levels**. In contrast, the metabolic parameters (insulin resistance or hypercholesterolemia) in placebo subjects continued to deteriorate over time.

Who does it benefit? According to the WHO, one in three people die every day from cardiovascular disease worldwide. **In Western countries, one in two people is overweight and has increased cardiovascular risks**. This research of the UCLouvain would limit these risks and therefore potentially have an impact (limit the effects) on half of the population, if properly used.

In conclusion, this pilot study demonstrates the feasibility of administrating (pasteurized) *Akkermansia* bacteria to humans in the form of a food supplement and reports encouraging results on the effectiveness of the *Akkermansia*-based dietary supplements to reduce cardio-metabolic risk factors. These results pave the way for a **large-scale study**, to confirm/elaborate these first results, but also endorse the commercialization of the bacteria as food supplements, by 2021.

To carry out this research, Patrice Cani has benefited from **several fundings**, via the **FNRS** (Belgian Research National Funds), the **EOS** (EU Excellence of Science), the Funds **Baillet-Latour**, the **WELBIO**, the Bank Transatlantic Belgium, the **Walloon Region** (DGO6) and two European **ERC** grants (starting and proof of concept).

How to communicate about this research? It's in the details.

- **Food supplement or probiotic?**
 - o CORRECT: **food supplement** = concentrated source of nutrients intended to correct nutritional deficiencies of a person's regular diet
 - o INCORRECT: probiotic = living microorganism which, when consumed in adequate quantities, brings a health benefit to the human being. To be called probiotic, a product must have been the subject of many studies in humans. As of yet, **no bacteria (or product) sold on the European market may be referred to as a probiotic**.
→ the bacteria ***Akkermansia*** is not a probiotic
- **Limit or treat risk factors?**
 - o CORRECT: **Limit**: "Limit the increase of risk factors" applies to food supplements
→ ***Akkermansia*** limits cardiovascular risk factors
 - o o INCORRECT: treat: treatments only apply to drugs
→ the clinical tests were not carried out with drugs but with a food supplement
- **Study or clinical trials?**
 - o CORRECT: UCLouvain and the Cliniques universitaires Saint-Luc have conducted a **clinical study** with dietary supplements
 - o INCORRECT: clinical trials refer to the administration of a drug/treatment.
- **Volunteer or patient?**
 - o CORRECT: **volunteer** = person made a conscious decision to enroll in a clinical study
 - o INCORRECT: patient = person under treatment
→ the UCLouvain researchers have not tested any treatment

³ These results are statistically considered non-significant. That said, according to the precise analysis of the different intestinal bacteria (in collaboration with the team of Prof. Raes of the KULeuven), the observed effects are independent of a general modification of the microbiota and therefore probably specific to the action of *Akkermansia*.