The science behind Akkermansia muciniphila

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Abstract

Akkermansia muciniphila was in isolated in 2004 in an attempt to discover new gut microbiota members. This bacterium was the first indication that bacteria belonging to the phylum Verrucomicrobia were present in the human gut, and lead to new 16S rRNA gene primer design for microbiota profiling. The discovery of *A. muciniphila* also led to many new insights of functionalities of bacteria in the gut. As such it led to the paradigm shift that microbes that associate with the mucosa can have beneficial functions for the host. The bacterium prompted many researchers to explore what the beneficial role to the host could be. Recently *A. muciniphila* has been accepted by EFSA for save use as food ingredient in a pasteurized form. While intervention studies report that living *A. muciniphla* strains are also save for use in humans.

The highlights of the research on *A. muciniphila* of the past 10 years are the results of multiple research fields and findings and can be summarized as follows:

- it is present in guts systems of a variety of animals,
- the diversity of *Akkarmansia* taxa in the gut is more divers than just *A. muciniphila,*
- it has many genomic adaptations to thrive in the gut mucosa,
- its glycan degrading abilities work on both mucins and human milk oligosaccharides,
- it is an important key-stone member of the animal gut microbiome that initiates cross feeding,
- it is genetically accessible,
- it can increase mucus thickness and gut barrier,
- it can change the metabolic profile of mammals,
- it has outer membrane pili that induce immune response