

NEW MOLECULAR LINK BETWEEN GUT MICROBIOTA VIRUSES AND ANTHRANILIC ACID TO TREAT OBESITY AND FOOD ADDICTION

A research group from IDIBGI, UPF and CIBER has discovered that specific bacteriophages are associated with food addiction and obesity

The Need

Food addiction is characterized by loss of control over food intake and is an important factor contributing to the current obesity pandemic. The gut microbiota plays an important role, although the role of the largest component of the gut microbiota, the virome, is still largely unexplored.

Understanding how specific viral components influence addiction-related behaviors and metabolic processes is crucial for developing new strategies to combat obesity and food addiction.

The Solution

A specific bacteriophage from the Microviridae family has been associated with food addiction and phenotypic traits related to addiction vulnerability and obesity in about 2,000 participants.

Bacteriophage levels were associated with increased connectivity in cortical and subcortical areas, which are linked to obesity and addiction, and strongly associated with lower circulating levels of anthranilic acid, which decreases food addiction or associated phenotypes.

Innovative Aspects

- Microviridae were associated with food addiction and obesity in a discovery cohort and two validation cohorts.
- Microviridae were linked to lower inhibitory control, obesity, and alterations in functional brain connectivity.
- Microbial-derived anthranilic acid (AA) was linked to specific bacteriophages, and AA supplementation decreases food addiction traits in mice and reduces food intake in flies.
- Microbiota transplantation from human donors' feces rich in certain types of bacteriophages induced an addiction-like phenotype in recipient mice.
- *Faecalibacterium prausnitzii* was identified as the host of these bacteriophages via CRISPR, which could explain the metabolic changes related to food addiction and obesity.

Stage of Development:

The association between specific bacteriophages, food addiction and obesity has been identified and validated in four independent human cohorts (about 2,000 participants). Mechanistic insights have been explored in preclinical models, where microbiota and virome transplantation induced addiction-like phenotypes.

Intellectual Property:

- Priority European patent application filed.

Aims

Looking for a partner interested in a license and/or a collaboration agreement to develop and exploit this asset.

Contact details