

The Mechanism of Parabacteroides goldsteinii on Immune Modulation and Anti-Obesogenicity

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Abstract : It is urgent that novel anti-obesity measures that are safe, effective and widely available are developed for counteracting the rapidly growing obesity epidemics. In the present study, we show that a probiotic bacterium Parabacteroides goldsteinii screened through culture under the high molecular weight polysaccharides prepared from two iconic medicinal fungi, the Ganoderma lucidum and the Hirsutella sinensis, reduced body weight by ca. 20% in high-fat diet (HFD)-fed mice. The bacterium also decreased intestinal permeability, metabolic endotoxemia, inflammation and insulin resistance. Notably, oral administration of live, but not high temperature-killed, P. goldsteinii to HFD fed mice considerably reduces weight gain and obesity-associated metabolic disorders. A three months feeding of the mice with P. goldsteinii did not show any aberrant side effects, indicating the safety of this bacterium. Transcriptome analysis indicated that P. goldsteinii enhances immunity in resting dendritic cells, but reduces inflammation in lipopolysaccharide (LPS)-induced dendritic cells. On top, Naïve T-cells were skewed towards regulatory T-cells after encountering with dendritic cells (DCs) pretreated with P. goldsteinii. These results indicated P. goldsteinii showed anti-inflammatory effects and can work as a potential probiotic ameliorating obesogenicity and related metabolic syndromes.

Keywords : Parabacteroides goldsteinii, gut microbiome, obesity, immune modulation

Conference Title : ICM 2018 : International Conference on Microbiome

Conference Location : Amsterdam, Netherlands

Conference Dates : December 03-04, 2018