

Methods To Regulate Colonization Of Select Bacteria Of The Microbiome

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Technology description

Summary

UCLA researchers in the Department of Integrative Biology and Physiology have identified a novel function of serotonin in regulating colonization of select bacterial species in the gut microbiome, and have identified specific bacteria that may modulate host intestinal lipid and steroid metabolism.

Background

Serotonin, or 5-hydroxytryptamine (5-HT) is a neurotransmitter, and is primarily found in the gastrointestinal tract, blood platelets, and the central nervous system. It regulates a variety of biological functions, including enteric motor and secretory reflexes, platelet aggregation, immune responses, bone development, and cardiac function. Serotonin deficiency is associated with pathogenesis of irritable bowel syndrome, cardiovascular disease, osteoporosis, abnormal platelet aggregation, defect in immune response, depression, and many others.

Innovation

Researchers at UCLA have previously reported that spore-forming microbes stimulate colon serotonin biosynthesis, and regulate the serum serotonin levels in the host. Recently, they have identified a novel function of serotonin in regulating colonization of indigenous members of the gut microbiome, and have identified small molecules that can selectively promote or inhibit colonization of select bacterial species of the gut microbiome. They have also identified select bacteria that modulate host intestinal lipid and steroid metabolism in these bacterial species. Intestinal enrichment of select bacterial species reduces systemic triglyceride levels and adipocyte size in the host and may promote the host's metabolic health.

Application area

Promotes human intestinal fitness

Advantages

Allows regulation of select bacterial species of the gut microbiome by small molecules

Identifies specific genes in select bacterial species for regulation of host steroid and lipid metabolism

Institution

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