Methods to Prevent Inhibit, or Treat Dysbiosis and Dysbiosis-Associated Disorders using Virus-like Particles

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Technology description

A novel therapy for treating dysbiosis, specifically small intestinal bacterial overgrowth (SIBO), by utilizing virus-like particles (VLPs).
This technique is capable of targeting and resolving the entire bacterial community imbalance; as opposed to, only a specific pathogen. In addition, the VLPs can be collected from an array of environmental samples that similarly represent the targeted impaired microbiota. After enrichment, the treatment can be administered through a variety of formulations, from encapsulated vehicles to incorporation into implanted devices (pacemakers, stents, catheters, etc.).

Background

Dysbiosis is characterized by a microbial imbalance in the gastrointestinal tract, usually referred to as an impaired microbiota. Dietary changes, chemical consumption, high stress, and new medications can all trigger a disruption of an individual’ s gut microbiome. This imbalance can lead to the implantation of outside vectors such as pathogens within the gut environment. Thus, dysbiosis can be associated with a wide range of disorders including: irritable bowel syndrome (IBS), fibromyalgia, cirrhosis, colitis, and cancer. Of particular interest, is small intestinal bacterial overgrowth (SIBO); a form of dysbiosis related to Crohn’ s disease and IBS. Current available treatments are antibiotic administration, probiotic supplements and fecal microbiota transplantation (FMT). However, the alarming growth rate of antibiotic resistance requires an alternative therapy option for bacterial infections. In addition, the probiotic supplements are limited to reintroducing only a select number of live bacterial components into the microbiome. Furthermore, a FMT can result in the transition of contaminants between donor and recipient; therefore, an alternative treatment is crucial.

Technology Description

Researchers at the University of New Mexico have developed a novel therapy for treating dysbiosis, specifically small intestinal bacterial overgrowth (SIBO), by utilizing virus-like particles (VLPs). This technique is capable of targeting and resolving the entire bacterial community imbalance; as opposed

to, only a specific pathogen. In addition, the VLPs can be collected from an array of environmental samples that similarly represent the targeted impaired microbiota. After enrichment, the treatment can be administered through a variety of formulations, from encapsulated vehicles to incorporation into implanted devices (pacemakers, stents, catheters, etc.).

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Application area

Increased bacterial rebalancing efficiency
Ability to target the entire gut microbiome, as compared to a single pathogen
Useful in preventing, inhibiting, and revising gastrointestinal tract imbalances
Compounded attributes of VLPs can treat an array of dysbiosis-associated disorders
Applications for numerous treatment delivery formulations (pills, powders, incorporated into implanted devices)

Institution

The University of New Mexico

Inventors

Derek Lin
Britt Koskella
Henry Lin

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com