A Method For Screening Drugs, Nutritional Supplements And Probiotics For Their Ability To Enhance Or Disrupt The Gut Barrier

Published date: May 10, 2017

Technology description

Researchers at UC San Diego have dissected a novel molecular pathway that can help protect the integrity of the gut barrier from assault by harmful microbes and other stressors. These findings have helped to elucidate methods whereby components of this pathway can be targeted to prevent the progression of chronic diseases.

The gut is a complex environment; the gut mucosa maintains immune homeostasis under physiological circumstances by serving as a barrier that restricts access of trillions of microbes, diverse microbial products, food antigens and toxins to the largest immune system in the body. The gut barrier is comprised of a single layer of epithelial cells, bound by cell-cell junctions, and a layer of mucin that covers the epithelium. Loosening of the junctions induced either by exogenous or endogenous stressors, compromises the gut barrier and allows microbes and antigens to leak through and encounter the host immune system, thereby generating inflammation and systemic endotoxemia. An impaired gut barrier (e.g. a leaky gut) is a major contributor to the initiation and/or progression of various chronic diseases including, but not limited to, metabolic endotoxemia, type Ⅱ diabetes, fatty liver disease, obesity, atherosclerosis and inflammatory bowel diseases. Despite the growing acceptance of the importance of the gut barrier in diseases, knowledge of the underlying mechanism(s) that reinforce the barrier when faced with stressors is incomplete, and viable and practical strategies for pharmacologic modulation of the gut barrier remain unrealized.

Application area

This invention could potentially be used to set up screens to identify probiotics or compounds that have beneficial effects on the gut barrier. Tightening leaky gut is an effective way to inhibit systemic chronic endotoxemia, which drives many chronic diseases [allergic, autoimmune and infectious and metabolic,including obesity, fatty liver, type Ⅱ DM, coronary artery disease, etc.].

Institution

University of California, San Diego

Inventors

Pradipta Ghosh
Soumita Das