

Bile Acid Conjugate as an Alternative to Antibiotics for Prevention and Treatment of Enteric Bacterial Infections

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Technology description

Reduces Inflammation of the Intestines Without Disrupting Microbial Ecological Balance

This conjugated bile acid treats and prevents *Campylobacter jejuni* (*C. jejuni*) bacterial infections. *C. jejuni* is a prevalent food-born bacterial pathogen that is the leading cause of bacterial-induced diarrheal illness in the United States. Every year an estimated 1.3 million people suffer from *C. jejuni* infections. Intestinal diseases usually self-resolve within a week, but some people develop serious post-infection complications, including arthritis, Guillian-Barré Syndrome, irritable bowel syndrome, and inflammatory bowel diseases. Although antibiotics can treat these bacterial infections, they have significant and long-lasting effects, disrupt the intestinal microbiota and increase susceptibility to future infections such as *C. difficile*.

Researchers at the University of Florida have identified a conjugated bile acid, or secondary bile acid, that prevents the inflammation host response when exposed to *C. jejuni* bacteria. The conjugate is an alternative to antibiotics and prevents inflammation and diarrhea caused by virulence factors from enteric bacteria.

Technology

This bile acid conjugate deactivates the mTOR pathway or prevents the mTOR pathway from activating in intestinal tissue. The mTOR pathway is responsible for promoting host inflammation that causes enterocolitis by blocking autophagy, an anti-microbial pathway. In the large intestines, primary bile acids biotransform into secondary bile acids, which prevent *C. jejuni* bacterial growth. In fighting off the intestinal infection, antibiotics would negatively alter the bacterial community of the large intestines, decreasing the concentration of secondary bile acids. Additionally, bacterial cocktails to replenish the intestinal bacterial community increase the risk of colon cancer and increase *Campylobacter* antigen production. Practitioners can administer this bile acid conjugate which relieves symptoms of enterocolitis quicker than when allowed to self-resolve.

Application area

Conjugated bile acid that treats or prevents intestinal bacterial infections without compromising the microbial ecological system

Advantages

Eliminates need for antibiotic treatment, preventing the disruption of microbial ecological balance

Works quickly, relieving symptoms of enterocolitis in a shorter period of time than they naturally subside

Limits inflammation and diarrhea caused by *C. jejuni* virulence factors

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