Peptide Therapy for Inflammatory Bowel and Celiac Diseases

A safe and effective therapy based on the bacterial AvrA peptide for the treatment of inflammatory bowel and celiac diseases.

Problem Solved by This Technology
Successful therapeutic strategies for inflammatory bowel disease (IBD) or celiac disease must inhibit intestinal inflammation while maintaining the structural integrity of intestinal epithelial cells. No existing drug can do both.

Applications
Salmonella enterica serovar Typhimurium is a major cause of human gastroenteritis. It disrupts tight junction (TJ) structure and function. TJ disruption is dependent on the type III secretory system (TTSS) of Salmonella. The bacterial effector AvrA has recently been shown to regulate intestinal epithelial cell TJ during inflammation. Dr. Sun at the University of Rochester has discovered that AvrA proteins possess the dual functionalities of both inhibiting intestinal inflammation and maintaining the integrity of intestinal epithelial cells. Experiments in cultured colonic epithelia cells as well as bacterially infected mouse models have demonstrated that AvrA proteins maintain intestinal stem cells, stabilize tight junctions, and suppress the pro-inflammatory NF-κB pathway. The active domain of AvrA has also been identified allowing for designing of stable peptide therapeutics.

Intellectual Property Status

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