

# Use of Short-Chain Fatty Acids for the Recovery of the Intestinal Epithelial Barrier Affected by Bacterial Toxins

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## **Abstract**

Short-chain fatty acids (SCFAs) are carboxylic acids produced as a result of gut microbial anaerobic fermentation. They activate signaling cascades, acting as ligands of G-protein-coupled receptors, such as GPR41, GPR43, and GPR109A, that can modulate the inflammatory response and increase the intestinal barrier integrity by enhancing the tight junction proteins functions. These junctions, located in the most apical zone of epithelial cells, control the diffusion of ions, macromolecules, and the entry of microorganisms from the intestinal lumen into the tissues. In this sense, several enteric pathogens secrete diverse toxins that interrupt tight junction impermeability, allowing them to invade the intestinal tissue and to favor gastrointestinal colonization. It has been recently demonstrated that SCFAs inhibit the virulence of different enteric pathogens and have protective effects against bacterial colonization. Here, we present an overview of SCFAs production by gut microbiota and their effects on the recovery of intestinal barrier integrity during infections by microorganisms that affect tight junctions. These properties make them excellent candidates in the treatment of infectious diseases that cause damage to the intestinal epithelium. © Copyright © 2021 Pérez-Reytor, Puebla, Karahanian and García.

## **Author keywords**

bacterial toxins; epithelial barrier; short-chain fatty acid; tight junctions; zonula occludens toxins