Gut Commensal Bacteria Ameliorate Salmonella Infection and Rescue Cellular Response of Host

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Abstract

Bacterial enteritis is often associated with inflammation of the intestinal mucosa, which can disrupt the integrity of tight junctions between epithelial cells lining the intestine. The invasion of pathogenic bacteria into the intestinal epithelium activates immune cells, leading to the production of pro-inflammatory cytokines. Bacterial enteritis alters the composition of the gut microbiota and leads to dysbiosis. Using the foodborne pathogen *Salmonella* enterica serovar *Typhimurium*, we demonstrated the applicability of our model to enteric infection research.

Parabacteroides goldsteinii, a candidate of Next-generation probiotics. This advanced probiotics aim to modulate the gut microbiota and host immune responses more effectively to promote health and alleviate inflammation.

These interactions of mucosal response modulation can affect the expression of genes involved in immune signaling pathways, cytokine production, and mucosal barrier integrity. Transcriptomic studies provide insights into the gene expression changes that occur in the gut mucosa in response to host-microbe interactions, inflammation, and mucosal defense mechanisms.

The barrier function is crucial for preventing the entry of harmful substances and pathogens into the bloodstream. REG3G also helps regulate the activation and migration of immune cells in gastrointestinal system, the mRNA expression level of Reg3g is validated to be higher in STM+PG. The results of our study suggest that REG3γ overexpression in gut epithelial cells may affect the composition of gut microbiota, in which *P. goldsteinii* colonization upregulated REG3γ expression.

This research may lead to the development of novel strategies for manipulating the gut microbiota to promote anti-inflammatory effects and maintain mucosal health.

Keywords

Probiotics, Salmonella, *Parabacteroides goldsteinii.*