

The pleiotropic effects of prebiotic galacto-oligosaccharides on the aging gut

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Abstract

Our gut microbes keep us healthy, regulating metabolism and immunity, but at the end of life, the gut microbiota is fragile, enhancing our susceptibility to diseases like *C. difficile*. One method of enhancing intestinal health is to incorporate prebiotics like galacto-oligosaccharides (GOS) into the diet. A recent study evaluated the impact of GOS diets on hallmarks of gut aging, including dysbiosis, inflammation and increased intestinal permeability. Using a mouse model, researchers found that older animals had increased ratios of bacteria that don't process sugars (non-saccharolytic) to those that do (saccharolytic). GOS also reduced age-associated intestinal permeability and increased mucus thickness in older mice. Antibiotics reduced the abundance of beneficial Bifidobacteria while increasing the abundance of pathogenic bacteria and GOS diets increased serum levels of IL-17 and IL-6 (inducers of inflammation that help to protect us against invading pathogens) and restored levels of TNF-alpha (a regulator of immune cells) in the distal colon. GOS also induced the expression of genes involved in small molecule metabolic processes in old animals. Although further studies are needed to verify this preclinical animal study, the results suggest that prebiotics affect the homeostasis of the aging gut by promoting changes in microbiome composition and host gene expression.