

Recent Studies and Publications on Prebiotics

STUDIES

1. Fructooligosaccharides On Inflammation, Immunomodulation, Oxidative Stress, And Gut Immune Response: A Systematic Review

The objective of this **systematic review** was to assess the present knowledge of the effects of Fructooligosaccharides (FOSs) on inflammation, immunomodulation, oxidative stress, and gut immune response.

A qualitative analysis revealed that FOSs can increase *bifidobacteria* counts and short-chain fatty acids in the gut, stimulate IgA secretion in the colon, and decrease proinflammatory cytokines, thus influencing metabolic diseases.

Source: Gislei F Aragão, Drug Research And Development Center, Faculty Of Medicine, Federal University Of Ceará And Superior Institute Of Biomedical Sciences, State University Of Ceará, Fortaleza, Ceará, Brazil. Fructooligosaccharides On Inflammation, Immunomodulation, Oxidative Stress, And Gut Immune Response: A Systematic Review. Nutrition Reviews, Volume 80, Issue 4, April (2022), Pages 709–722. <https://doi.org/10.1093/nutrit/nuab115>

2. Effect Of Prebiotic Fermentation Products From Primary Human Gut Microbiota On An In Vitro Intestinal Model

In this study the products of fermentation of prebiotic-enriched media by bacteria from primary human faecal samples were tested on differentiated Caco-2/HT29-MTX co-cultures.

Study result shows that none of the fermentation products caused an inflammatory response. The products of fermentation of fructooligosaccharides (FOS)-enriched media showed a moderate protective effect against the formation of reactive oxygen species. This will provide an important basis for the development of in vitro models using a simple approach to evaluate host-gut microbiota interactions.

Source: Catarina Gonçalves, International Iberian Nanotechnology Laboratory, Avenida Mestre José Veiga, Portugal. Effect Of Prebiotic Fermentation Products From Primary Human Gut Microbiota On An In Vitro Intestinal Model. Journal Of Functional Foods, Volume 96, September (2022), 105200. <https://doi.org/10.1016/j.jff.2022.105200>

3. The Latest Progress Of Natural Food Polysaccharides Preventing Ulcerative Colitis By Regulating Intestinal Microbiota

This **systematic review** explores the latest research progress on natural food polysaccharides in preventing ulcerative colitis (UC) and restoring intestinal health by regulating the intestinal microbiota. It provides a theoretical basis for the nutritional prevention mechanism of UC and the recovery of intestinal health using natural food polysaccharides. Importantly, whether natural food polysaccharides can prevent UC through the microbe-gut-brain axis is expected to be a new direction for future research.

Source: Lirong Han, Key Laboratory Of Public Health Safety Of Hebei Province, Ministry Of Education & College Of Public Health, Hebei University, China. The Latest Progress Of Natural Food Polysaccharides Preventing Ulcerative Colitis By Regulating Intestinal Microbiota. Journal Of Functional Foods, Volume 96, September (2022), 105201. <https://doi.org/10.1016/j.jff.2022.105201>

4. Microbiota Responses To Different Prebiotics Are Conserved Within Individuals And Associated With Habitual Fiber Intake

In this clinical trial study researchers have explored prebiotic personalization by conducting a three-way crossover study of three prebiotic (inulin, wheat dextrin and galactooligosaccharides [GOS]) treatments in healthy adults.

Scientists have found that within individuals, metabolic responses were correlated across the three prebiotics. Individual identity, rather than prebiotic choice, was also the major determinant of short chain fatty acids SCFA response. Across individuals, prebiotic response was inversely related to basal fecal SCFA concentration, which, in turn, was associated with habitual fiber intake.

Further, experimental measures of gut microbial SCFA production for each participant also negatively correlated with fiber consumption, supporting a model in which individuals' gut microbiota are limited in their overall capacity to produce fecal SCFAs from fiber.

Source: Lawrence A. David, Department Of Molecular Genetics And Microbiology; Center For Genomic And Computational Biology And Program In Computational Biology And Bioinformatics, Duke University, Genome Court, Durham, NC, USA. Microbiota Responses To Different Prebiotics Are Conserved Within Individuals And Associated With Habitual Fiber Intake. Microbiome 10, 114 (2022). <https://doi.org/10.1186/s40168-022-01307-x>

5. Direct Action Of Non-Digestible Oligosaccharides Against A Leaky Gut

This systematic review provides a comprehensive overview of the epithelial barrier-protective effects of different Non-Digestible Oligosaccharides (NDOs) with a special focus on their microbiota-independent modulation of tight junctions (TJs).

Source: Saskia Braber, Division Of Pharmacology, Utrecht Institute For Pharmaceutical Sciences, Faculty Of Science, Utrecht University, The Netherlands. Direct Action Of Non-Digestible Oligosaccharides Against A Leaky Gut. Nutrients (2022), 14, 4699. <https://doi.org/10.3390/nu14214699>

6. Structure And Function Of Non-Digestible Carbohydrates In The Gut Microbiome

This systematic review focuses on the physiological impact of non-digestible carbohydrates (NDC) on gut microbiota and the potential of these NDC to function as prebiotics.

Source: R.A. Rastall, Department Of Food And Nutritional Sciences, The University Of Reading, United Kingdom. Structure And Function Of Non-Digestible Carbohydrates In The Gut Microbiome. Beneficial Microbes: 13 (2)- Pages: 95 – 168. <https://doi.org/10.3920/BM2021.0090>

7. Stability Of Human-Milk Oligosaccharide Concentrations Over 1 Week Of Lactation And Over 6 Hours Following A Standard Meal

The purpose of this study was to determine the stability of HMO concentrations over 7 days and in response to a standard meal and sugar-sweetened beverage (SSB) over 6 hour.

Study result shows that HMO concentrations are stable over 1 week of lactation and are not acutely affected by a standard meal plus SSB consumption by mothers.

Source: Lars Bode, Department Of Pediatrics And Mother-Milk-Infant Center Of Research Excellence (MOMI CORE), University Of California, San Diego, La Jolla, CA, USA. Stability Of Human-Milk Oligosaccharide Concentrations Over 1 Week Of Lactation And Over 6 Hours Following A Standard Meal. The Journal Of Nutrition, Volume 152, Issue 12, December (2022), Pages 2727-2733. <https://doi.org/10.1093/jn/nxac214>

8. An Alternative Oat-Containing, Ready-To-Use, Therapeutic Food Does Not Alter Intestinal Permeability Or The 16S Ribosomal RNA Fecal Microbiome Configuration Among Children With Severe Malnutrition In Sierra Leone: A Randomized Controlled Trial

In this prospective, randomized, double-blinded, controlled clinical trial researchers have determined the effects of oat ready-to-use therapeutic food (o-RUTF) on intestinal permeability, as measured by lactulose permeability, and the 16S ribosomal RNA (rRNA) fecal microbiome configuration of children with Sever Acute Malnutrition (SAM).

Despite remarkably different compositions of o-RUTF and s-RUTF, no differences were identified in lactulose permeability or the fecal 16S rRNA configuration among children with SAM receiving these foods. These results suggest that the o-RUTF exerts its beneficial effects through mechanisms other than reducing intestinal permeability or altering the fecal 16S configuration.

Source: D Taylor Hendrixson, Department of Pediatrics, University of Washington, Seattle, WA, USA. An Alternative Oat-Containing, Ready-To-Use, Therapeutic Food Does Not Alter Intestinal Permeability Or The 16S Ribosomal RNA Fecal Microbiome Configuration Among Children With Severe Malnutrition In Sierra Leone: A Randomized Controlled Trial. The Journal of Nutrition, Volume 152, Issue 12, December (2022), Pages 2744-2753. <https://doi.org/10.1093/jn/nxac207>

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