

Special Issue

Metabolic Nutrition: Diet–Microbiota Interactions in Obesity and Inflammation

Message from the Guest Editors

Obesity and related diseases are linked to chronic low-grade inflammation, with diet–microbiota interactions central. Beyond calories, obesity involves dysbiosis, increasing energy harvest, gut permeability, and inflammation, contributing to type 2 diabetes, heart disease, and NAFLD/MASLD. Diet shapes the microbiome. High-fat, high-sugar diets promote inflammation, while fiber supports microbes producing short-chain fatty acids, maintaining barrier health, immunity, and metabolism. Early nutrition, including breastfeeding, sets microbial patterns affecting obesity risk. Personalized nutrition based on microbiome profiling shows promise. Probiotics, prebiotics, and synbiotics may improve body composition and reduce inflammation. This Special Issue invites research and reviews papers on: Dietary impacts on microbiota and obesity/inflammation; Microbial mechanisms in metabolism and immunity; Microbiota-targeted interventions (diet, probiotics, prebiotics, FMT); Diet–microbiota interactions across life stages; Translational research, including personalized nutrition; Multi-omics, machine learning, or systems biology linking diet, microbiome, and host phenotypes.

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