Special Issue

Probiotics in Human Health and Disease

Message from the Guest Editor

In the last decade, the attention towards probiotics has expanded significantly, with modern research highlighting their potential and effectiveness in modulating the immune system, improving metabolic function, and influencing the gut-brain axis.

Yet the field faces a critical bottleneck: while numerous studies confirm that probiotics work in various conditions, the molecular mechanisms underlying their host interactions remain poorly understood. Strain-specific effects, variable colonization efficiency, and the lack of predictive biomarkers for clinical response continue to challenge the translation of probiotics into reliable therapeutic strategies.

This Special Issue aims to address the unresolved scientific questions in probiotic research. We invite contributions focusing on:

Molecular mechanisms of probiotic-host interactions (immune modulation, metabolic signaling, gut-brain axis);

Strain-specificity and individualization: why do some strains work in some hosts but not others?

Safety and regulatory challenges, particularly in immunocompromised populations;

Next-generation approaches, including engineered probiotics, postbiotics, omics-driven discovery.

Guest Editor

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Message from the Editor-in-Chief

"Microorganism" merges the idea of the very small with the idea of the evolving reproducing organism is a unifying principle for the discipline of microbiology. Our journal recognizes the broadly diverse yet connected nature of microorganisms and provides an advanced publishing forum for original articles from scientists involved in high-quality basic and applied research on any prokaryotic or eukaryotic microorganism, and for research on the ecology, genomics and evolution of microbial communities as well as that exploring cultured microorganisms in the laboratory.

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manuscripts are peer-reviewed and a first decision is provided to authors approximately 20 days after submission; acceptance to publication is undertaken in 2.9 days (median values for papers published in this journal in the second half of 2025).

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