Special Issue

Exploring the Gut–Brain Axis in Dementia: Biomarkers, Microbiota, and Machine Learning Approaches

Message from the Guest Editor

Dementia, a leading cause of disability worldwide, has been increasingly linked to dysbiosis of the gut microbiota and systemic inflammation. Emerging evidence suggests that gut-brain axis interactions play a crucial role in neurodegenerative processes, offering potential avenues for early diagnosis and intervention. This Special Issue aims to gather cutting-edge research on the interplay between gut microbiota, biomarkers, and dementia, with a focus on innovative machine learning (ML) approaches to analyze complex datasets and predict disease progression. We invite original research articles, reviews, and methodological papers addressing, but not limited to, the following topics:

- Gut microbiota alterations in Alzheimer's disease and other dementias
- Novel biomarkers (e.g., microbial metabolites, inflammatory markers, genetic/epigenetic signatures) for early detection
- Machine learning and AI-driven models for dementia prediction using multi-omics data
- Therapeutic interventions targeting the gut microbiome (e.g., probiotics, prebiotics, fecal transplants)
- Integrative analyses of microbiome, metabolome, and clinical data

Guest Editor

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About the Journal

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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