# Special Issue

# The Role of the Gut Microbiome in Antibiotic Resistance and Therapy: Mechanisms and Implications

## Message from the Guest Editor

This Special Issue explores the interplay between the gut microbiome, antibiotic resistance, and therapy. Antibiotics, while crucial for treating bacterial infections, disrupt the gut microbiome by eliminating both harmful and beneficial bacteria, reducing microbial diversity and enabling resistant strains to thrive. The gut microbiome serves as a reservoir of antibiotic resistance genes, facilitating their horizontal transfer and contributing to multidrug resistance. Conversely, beneficial commensals help mitigate resistance through competitive exclusion and antimicrobial production. Advances in metagenomics and metabolomics enable personalized antibiotic strategies that minimize collateral damage to beneficial microbes. Adjunctive therapies like probiotics and prebiotics show promise in restoring gut balance and mitigating antibiotic side effects. Understanding these mechanisms is essential for developing new therapies to combat resistance and preserve antibiotic efficacy.

## Guest Editor

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## Deadline for manuscript submissions

closed (15 October 2025)

**Antibiotics**

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### Message from the Editor-in-Chief

There are very few fields that attract as much attention as scientific endeavor related to antibiotic discovery, use and preservation. The public, patients, scientists, clinicians, policy-makers, NGOs, governments, and supra-governmental organizations are all focusing intensively on it: all are concerned that we use our existing agents more effectively, and develop and evaluate new interventions in time to face emerging challenges for the benefit of present and future generations. We need every discipline to contribute and collaborate: molecular, microbiological, clinical, epidemiological, geographic, economic, social scientific and policy disciples are all key. *Antibiotics* is a nimble, inclusive and rigorous indexed journal as an enabling platform for all who can contribute to solving the greatest broad concerns of the modern world.

### Editor-in-Chief

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