

## Special Issue

# Production of Bioactive Compounds by Microbes: Biosynthetic Pathway Elucidation and Metabolic Engineering

### Message from the Guest Editors

Microbes serve as potent cell factories for the production of bioactive compounds, which could be applied in medicine, agriculture, food, cosmetics, and various industries, often with the aid of engineering tools. The elucidation of biosynthetic pathways and the application of metabolic engineering are critical for achieving the efficient production of these valuable compounds. Pathway elucidation relies on genomic sequencing, gene annotation, and experimental validation to uncover the key enzymes driving the synthesis. Metabolic engineering leverages genetic manipulation, metabolic flux analysis, and the reprogramming of microbial metabolism to enhance the titer, rate, and yield of target bioactive compounds. These strategies have been successfully implemented to produce plant-derived and microbial natural products, specialty chemicals, and biofuels. With continued advancements in synthetic biology, machine learning, and high-throughput screening, the microbial production of bioactive compounds is becoming increasingly efficient and scalable, unlocking new industrial opportunities.

### Guest Editors

Dr. Yongjun Wei

Dr. Ziqiao Yuan

Dr. Ying Zhang

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Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[ijms@mdpi.com](mailto:ijms@mdpi.com)

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### Editor-in-Chief

Prof. Dr. Maurizio Battino

Department of Odontostomatologic and Specialized Clinical Sciences,  
Sez-Biochimica, Faculty of Medicine, Università Politecnica delle  
Marche, Via Ranieri 65, 60100 Ancona, Italy

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