

Special Issue

Resveratrol: Pharmacological Mechanisms and Therapeutic Potential as a Natural Product

Message from the Guest Editors

Extensive preclinical evidence supports resveratrol's modulatory effects on critical signaling pathways, including SIRT1 activation, AMPK signaling, NF- κ B inhibition, and oxidative stress reduction. These molecular interactions underpin its antioxidant, anti-inflammatory, neuroprotective, cardioprotective, and anticancer properties. Notably, resveratrol's ability to influence mitochondrial biogenesis and cellular senescence pathways has renewed interest in its applications in age-related diseases and longevity research. However, despite compelling in vitro data, the compound's low bioavailability and rapid metabolism pose persistent challenges to clinical translation. As such, there is a growing need to complement in vitro insights with investigations conducted in physiologically relevant in vivo systems, which provide a more comprehensive understanding of resveratrol's pharmacokinetics, therapeutic efficacy, and safety in a biological context. By assembling original research articles, mechanistic studies, and translational reviews, this issue will catalyze a shift toward more physiologically relevant models in the study of natural compounds.

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Editor-in-Chief

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