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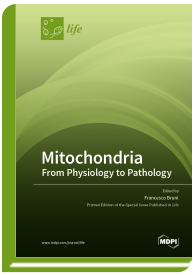
Special Issue Reprint

Mitochondria: From Physiology to Pathology



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Mitochondria play an increasingly central role in the context of cellular physiology. These organelles possess their own genome (mtDNA), which is functionally coordinated with the nuclear genome. Mitochondrial gene expression is mediated by molecular processes (replication, transcription, translation, and assembly of respiratory chain complexes) that all take place within the mitochondria. Several aspects of mtDNA expression have already been well characterized, but many more either are under debate or have yet to be discovered.

Understanding the molecular processes occurring in mitochondria also has clinical relevance. Dysfunctions affecting these important metabolic 'hubs' are associated with a whole range of severe disorders, known as mitochondrial diseases. In recent years, significant progress has been made to understand the pathogenic mechanisms underlying mitochondrial dysfunction; however, to date, mitochondrial diseases are complex genetic disorders without any effective therapy. Current therapeutic strategies and clinical trials are aimed at mitigating clinical manifestations and slowing the disease progression to improve the quality of life of patients.

The goal of the Special Issue 'Mitochondria: from Physiology to Pathology' published in Life (ISSN: 2075-1729) was to collect research and review articles covering the physiological and pathological aspects related to mtDNA maintenance and gene expression, mitochondrial biogenesis, protein import, organelle metabolism, and quality control.

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