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Melatonin in Human Health and Diseases

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Message from the Guest Editor

Melatonin is a small ubiquitous and pleiotropic molecule initially mainly recognized for its nocturne production and its role in the regulation of circadian rhythms. However, a great deal of evidence has confirmed the fundamental role of melatonin and its potential as an antioxidant agent. In vertebrates, melatonin is synthesized by the pineal gland and by a large number of organs, including but not limited to the retina, gastrointestinal tract, ovary and oocytes. Every cell in plants and animals produces melatonin in their mitochondria while, in green plants, melatonin is produced in chloroplasts. Its production starts from L-tryptophan, following a well-known enzymatic pathway. Moreover, melatonin also acts through its receptors present on the cellular membrane named MT1 and MT2, which are widely distributed in eukariotic cells. Via its receptors, and as a consequence of its receptor-independent actions, melatonin is a multitasking molecule. It has many properties including cancer inhibition, immune stimulation and cardioprotective effects. Recently, it was also able to limit neurodegenerative diseases.



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