

Acta Biochim Pol. 2003; 50(4): 1129-46.

**Melatonin as an antioxidant: biochemical mechanisms and pathophysiological implications in humans.**

**Reiter RJ, Tan DX, Mayo JC, Sainz RM, Leon J, Czarnocki Z.**

Department of Cellular and Structural Biology, University of Texas Health Science Center, San Antonio, Texas, U.S.A.

This brief resume enumerates the multiple actions of melatonin as an antioxidant. This indoleamine is produced in the vertebrate pineal gland, the retina and possibly some other organs. Additionally, however, it is found in invertebrates, bacteria, unicellular organisms as well as in plants, all of which do not have a pineal gland. Melatonin's functions as an antioxidant include: a), direct free radical scavenging, b), stimulation of antioxidative enzymes, c), increasing the efficiency of mitochondrial oxidative phosphorylation and reducing electron leakage (thereby lowering free radical generation), and 3), augmenting the efficiency of other antioxidants. There may be other functions of melatonin, yet undiscovered, which enhance its ability to protect against molecular damage by oxygen and nitrogen-based toxic reactants. Numerous in vitro and in vivo studies have documented the ability of both physiological and pharmacological concentrations to melatonin to protect against free radical destruction. Furthermore, clinical tests utilizing melatonin have proven highly successful; because of the positive outcomes of these studies, melatonin's use in disease states and processes where free radical damage is involved should be increased.

PMID: 14740000 [PubMed - in process]