

# Melatonin and Cancer Outcomes – a Review of Current Evidence <sup>†</sup>

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**Abstract:** An evolutionarily conserved molecule, multi-potent antioxidant, and mitochondrial protectant, melatonin is a hormone involved in numerous physiological activities, from circadian rhythm and immune regulation to tissue damage protection, development, and growth. 1) Background: Circadian disturbances, oxidative damage, and chronic inflammation have been shown to increase cancer risk while also being linked to lower melatonin levels. Adjuvant melatonin improved tumor remission, survival, and chemotherapy-related adverse events. Yet, the insufficient clinical evidence prevented melatonin from being included in oncology treatment guidelines, leaving the debate open to continued expert scrutiny. To be included in this review of the evidence, studies had to be a) a melatonin meta-analysis or systematic review or b) to include randomized cancer patients to a treatment regimen including adjuvant melatonin versus a no melatonin treatment and have not been yet included in a meta-analysis or systematic review at the time of the metasearch. Our review summarizes melatonin biochemistry, metabolism, and pharmacokinetics and reports the latest evidence regarding its use in oncology; In conclusion, lower melatonin levels, impaired melatonin receptor binding, or light at night exposure have all been associated with poor cancer outcomes allowing melatonin to distinguish as a positive modifier of cancer outcomes. Nonetheless, the absence of pharmaceutical industry financial support and the prohibitive costs of large phase III trials needed to provide the missing evidence may unnecessarily delay translating current knowledge into clinical guidelines. A concerted effort of oncology professionals remains the main influencer of cancer outcomes.

**Keywords:** melatonin; cancer; inflammation; antioxidant;

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## Conflicts of Interest

Not applicable.