Melatonin inhibits growth of cultured human uveal melanoma cells.


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Abstract

The effects of melatonin on the growth of human uveal melanoma cells were studied in vitro. Three continuous uveal melanoma cell lines were tested. Cells were plated into multi-well plates. After 24 h, melatonin was added to the medium at concentrations from 0.001 to 1000 nM. Cells were collected and counted after 5 days and compared with the controls. Melatonin inhibited the growth of melanoma cells in a dose-dependent manner (0.1-10 nM) with a mean inhibition rate of 50%. The uptake of bromodeoxyuridine (BrdU) by the melanoma cells was also measured. Melatonin inhibited the uptake of BrdU of melanoma cells at concentrations of 0.1-10 nM with a mean inhibition rate of 40%. These results indicate that melatonin may offer a new treatment for metastatic uveal melanoma.

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Melatonin receptors in human uveal melanocytes and melanoma cells.

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Abstract

Previous work has demonstrated that melatonin inhibits growth of cultured human uveal melanoma cells. The goal of this study was to determine the expression of mRNA encoding the melatonin receptor subtypes and the effect of specific melatonin receptor agonists on cell growth of uveal melanoma cells and melanocytes. RNA expression of the human melatonin Mel1a and Mel1b receptor subtypes was determined by reverse transcription-polymerase chain reaction (RT-PCR) amplification of RNA isolated from two melanoma cell lines and from one cell line of normal melanocytes. PCR-amplified cDNA encoding the Mel1b melatonin receptor subtype, but not the Mel1a subtype, was detected in reverse-transcribed RNA obtained from both normal uveal melanocytes and melanoma cell lines. Uveal melanoma cells and melanocytes were cultured for 24 hr, then melatonin or one of its membrane receptor agonists, 6-chloromelatonin (Mel1a-1b) or S-20098 (Mel1b) or its putative nuclear agonist, CGP-52608 (Mel2), was added to the medium. After 5 days, the cells were detached, counted, and compared to untreated controls. Melatonin and its membrane receptor agonists (Mel1a-1b and Mel1b), but not its putative nuclear receptor agonist (Mel2), inhibited the growth of uveal melanoma cells, but not normal melanocytes, at very low concentrations. In uveal melanoma cells, the expression of RNA encoding the Mel1b receptor suggests that the growth inhibiting effect of melatonin on uveal melanoma cells is related to activation of the melatonin Mel1b membrane receptor. Furthermore, the expression of RNA encoding melatonin receptors in normal uveal melanocytes suggests that melatonin may play a role in the function of these cells.

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