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Inhibitory effects of melatonin on sulfatase and 17beta-hydroxysteroid dehydrogenase activity and expression in glioma cells.

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Abstract

Melatonin interacts with estradiol at the estrogen receptor level in different kinds of neoplasias and also regulates the expression and the activity of some enzymes involved in the biosynthesis of estrogens in peripheral tissues. Glioma cells express estrogen receptors and have the ability to synthesize estrogens locally. Since melatonin inhibits the growth of C6 cells, and this indoleamine has been demonstrated to be capable of decreasing aromatase expression and activity in these cells, the aim of the present study was to analyze whether the regulation of the sulfatase, the enzyme that catalyzes the rate-limiting step in the conversion of estrogen sulfates to estrogens, and 17beta-hydroxysteroid dehydrogenase, the enzyme which converts the relatively inactive estrone to the most potent 17beta-estradiol, could be involved in the inhibition of glioma cell growth by melatonin. We found that melatonin decreases the growth of C6 glioma cells and reduces the sulfatase and 17beta-hydroxysteroid dehydrogenase activity. Finally, we demonstrated that melatonin downregulates sulfatase and 17beta-hydroxysteroid dehydrogenase mRNA steady state levels in these glioma cells. By analogy to the implications of these enzymes in other forms of estrogen-sensitive tumors, it is conceivable that their modulation by melatonin may play a role in the growth of glioblastomas.

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