

Reduced Melatonin Levels May Facilitate Glioblastoma Initiation in the Subventricular Zone

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Abstract

There is increasing evidence that glioblastoma, a highly aggressive brain tumor, originates from neural stem cell (NSC) located in the subventricular zone (SVZ) of the lateral cerebral ventricle. Using the most advanced *in vivo* imaging techniques, Gengatharan and colleagues recently identified a day/night difference in adult SVZ-NSC division. They reported that the circadian melatonin rhythm and its receptor control the day/night difference in NSC division with high mitotic activity during the day and low activity at night. Expression of melatonin and its receptor diminishes during aging, which eliminates the regulatory effect of melatonin on NSC mitosis. Moreover, the circadian melatonin rhythm is dampened by light-at-night with the potential of altering the circadian mitotic cycle of NSC in the SVZ. Also, men, with a lower melatonin amplitude than women, exhibit a 60% higher rate of glioblastoma incidence. Given that aging contributes significantly to glioblastoma initiation and progression, we suggest that the decline in circadian melatonin synthesis and release as well as its receptors in the SVZ which also diminish with aging act in concert with other factors to facilitate glioblastoma initiation and growth.

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Running head: Circadian Melatonin in Glioblastoma

Keywords: Glioblastoma, Melatonin, Neural Stem Cells, Cancer, Light