

Characterization of 5HT Receptors and Effect of 5HT on Proliferation in Ovarian Neoplastic Cells

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Abstract

Introduction: Serotonin (also known as 5-Hydroxytryptamine – 5HT) is commonly categorized as a neurotransmitter. 5HT has an enormous influence over many functions such as memory, anxiety and mood in the central nervous system. 5-HT has also been shown to act as a growth factor on many non-tumor cells such as vascular smooth muscle cells. In addition, 5-HT has been shown to promote cell proliferation in prostate and breast cancer cells. The effects of serotonin on ovarian tumor cell growth are yet to be characterized. Previous studies in the Lutgendorf lab have identified 5HT receptor expression levels in numerous ovarian cancer cell lines (e.g. least SKOV3 cells) compared to normal ovarian cells. The aim of this study was to characterize 5HT receptors more specifically the 5-HT2A receptor and to clarify the effect of 5HT on proliferation in neoplastic ovarian cells.

Method: Clonogenic survival assays were used to determine the effects of 5-HT and a specific 5-HT2A receptor agonist, DOI (2,5-dimethoxy-4-iodoamphetamine hydrochloride), on proliferation in neoplastic ovarian cells.

Results: At present the effect of 5HT showed no significant effects on cell proliferation on the ES2 ovarian cancer cell line.

Conclusion: Various studies reveals that only 1% of 5HT is usually found in the nervous system. The remainder is found in the periphery and is ascribed a several physiological functions. 5-HT receptors can be found on a variety of cells. Platelets have recently found to be the main transporter of peripheral 5-HT. Though current study did not signify the findings, future work includes repeating experiments, plating at a lower density and doing a western blot to identify protein expression within the sample.

Keywords: Serotonin, Ovarian Neoplasm, Brain, 5HT receptor.