Anticarcinogenic Property of Ruthenium (II) Polypyridyl Complex

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ABSTRACT

In pursuit of the global mission to curb cancer, finding novel and effective anti-cancer therapeutics has kept researchers on their toes. In recent years, cisplatin has emerged as one of the most extensively used antineoplastic drug to treat solid tumors. Successful use of cisplatin has given impetus to the studies directed towards development of other complexes of platinum. Nevertheless, several reports show neurotoxic effects of platinum based compounds, current focus is to synthesize and characterize complexes based on metals such as ruthenium, osmium, iron and copper as potential anticancinogenic agents. In the present study, we have aimed to identify a potent antiproliferative agent from a group of 28 novel metal-complexes. In the above light, the inhibitory activities of these complexes were investigated over human hepatoma cancer cell line Huh7 *in vitro* by MTT [3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide] assay, at a single dose concentration of 500 µM. At this concentration, a ruthenium (II) polypyridyl complex (RPC) manifested strong mean inhibition. It was further tested at five-dose testing mode in order to determine its efficacy as an anti-proliferative agent for chemotherapeutic administration. Subsequent DNA fragmentation analysis indicated that the complex could induce apoptosis in Huh7 cells. To validate it's antiproliferative property, we are testing its effect on a few other cancer cell lines for e.g. MCF-7, A431, HT1080. In support of MTT assay, Superoxide dismutase levels of the metal-complex exposed cell lines are also being monitored. Further, we want to state that, to the best of our knowledge, there is no ruthenium-based anticancer drug in clinical use, which calls for further characterization to decipher its activity at molecular level.

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