**Novel indole-based melatonin analogues: Evaluation of antioxidant activity and protective effect against amyloid β-induced damage**

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**Abstract**

Oxidative stress has been recognized as a contributing factor in ageing and various diseases including cancer and neuropathological disorders. Indole derivatives such as the neurohormone melatonin (MLT) constitute an important class of therapeutic agent in medicinal chemistry. MLT can scavenge different reactive oxygen species and can also stimulate the synthesis of antioxidant enzymes. As a part of our ongoing studies, a series of new indole-based hydrazide/hydrazone derivatives were synthesized as MLT analogues. Their antioxidant activity was investigated in human erythrocytes by evaluating their reducing effect against oxidation of a redox-sensitive fluorescent probe. Possible inherent cytotoxicity of the compounds was investigated in CHO-K1 cells by lactate dehydrogenase leakage test. Protection of neuronal PC12 cells against amyloid β-induced damage was examined by MTT assay and their ability in reduction of ROS generation induced by amyloid β was tested. MLT analogues having an o-halogenated aromatic moiety exhibited effective antioxidant properties without having any membrane-damaging effect. Moreover, derivatives having o-halogenated and dihalogenated aromatic side chain significantly protected neuronal cells at concentrations of 10 and 100 μM. In conclusion, MLT derivatives represent promising scaffolds for discovery of effective antioxidant and neuroprotective agents. © 2016 Elsevier Ltd. All rights reserved.