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Investigation of ameliorative effect of a polyphenolic compound of green tea extract against Rotenone induced neurotoxicity: A mechanistic approach

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Natural antioxidants have major role in maintenance of health. Green tea extract principally contains epigallocatechin-3-gallate (EGCG), as its abundant antioxidant constituent. Green tea is consumed daily worldwide as antioxidant to combat CNS diseases and has traditional importance also. EGCG has neuroprotective potential in various animal models of Parkinson disease, Alzheimer's disease etc. but its exact mechanism has not been ruled out. The present study has been designed to investigate the anti-inflammatory, antioxidant and mitochondrial modulating mechanism of neuroprotective effect of epigallocatechin-3-gallate against rodent model of rotenone induced Parkinson's disease (PD). The behavioural alterations were assessed by using open field test apparatus, Chatilon's grip strength test apparatus and elevated plus maze for determining the locomotor activity, grip strength and cognition respectively. Biochemically, various parameters to assess oxidative stress, neuroinflammation and neurochemical estimations were performed on rat brain homogenates. A histological examination of rat brain striatum was done to check the neurodegeneration. Epigallocatechin-3-gallate (EGCG) at 10 & 20 mg/kg, were investigated for their neuroprotective potential along with levodopa as a standard agent. Minocycline, a microglial activation inhibitor, was administered alone and in combination with EGCG. EGCG and minocycline produced ameliorative effect against rotenone induced PD like symptoms by significantly reduced behavioral, biochemical and histological alterations. Results of our study reveal the neuroprotective effect of EGCG and minocycline against rotenone induced PD. Results of our study indicate that EGCG exerted neuroprotective effect against rotenone induced PD via its antioxidant, anti-inflammatory and mitochondrial modulating mechanisms and substantiate its previously reported and traditional claims for its use in CNS diseases.

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Fabrication and characterizaion of biomedical materials for regenerating skin tissue using biocompatible materials from marine organisms

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An emerging paradigm in wound healing techniques is that a tissue-engineered skin substitute offers an alternative approach to create functional skin tissue. Here we developed a fish collagen/alginate (FCA) sponge scaffold that was functionalized by different molecular weights of chitooligosaccharides (COSs) with the use of 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide hydrochloride as a cross-linking agent. The effects of cross-linking were analyzed by Fourier transform infrared spectroscopy. The results indicate that the homogeneous materials blending and cross-linking intensity were dependent on the molecular weights of COSs. The highly interconnected porous architecture with 160–260 m pore size and over 90% porosity and COS's MW driven swelling and retention capacity, tensile property and *in vitro* biodegradation behavior guaranteed the FCA/COS scaffolds for skin tissue engineering application. Further improvement of these properties enhanced the cytocompatibility of all the scaffolds, especially the scaffolds containing COSs with MW in the range of 1–3 kDa (FCA/COS1) showed the best cytocompati-bility. These physicochemical, mechanical, and biological properties suggest that the FCA/COS1 scaffold is a superior candidate that can be used for skin tissue regeneration.

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