Facile preparation of zinc nanoparticles mediated by plant aqueous extract and assessment of the antioxidant, cytotoxicity and anti-human gastric carcinoma properties

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September 19, 2022

Abstract

In this study, the Zn nanoparticles was synthesized using the peel extract of Citrus aurantium. The nanoparticles was characterized by different chemical technique including UV-Vis. and FT-IR spectroscopy, and SEM technique. The results revealed a spherical shape in the average size of 41.17 nm was identified for the green-synthesized nanoparticles. In the antioxidant test, the IC50 of nanoparticles and BHT against DPPH free radicals were 115 and 96 µg/mL, respectively. In the cellular and molecular part of the recent study, the treated cells with nanoparticles were assessed by MTT assay for 48h about the cytotoxicity and anti-human gastric cancer properties on normal (HUVEC) and gastric cancer cell lines i.e. NCI-N87 and MKN45. The IC50 of nanoparticles were 278 and 256 µg/mL against NCI-N87 and MKN45 cell lines, respectively. The viability of malignant gastric cell line reduced dose-dependently in the presence of Zn nanoparticles. It seems that the anti-human gastric cancer effect of recent nanoparticles is due to their antioxidant effects. After evaluating the effectiveness of this formulation in clinical trial researches, it can be a good alternative to chemotherapy drugs.

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