Plant-based green-formulated cobalt nanoparticles: Introducing a novel chemotherapeutic supplement for the treatment of esophageal cancer

Ruimin Xu[1]

[1]Hainan Medical University

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Abstract

Linum usitatissimum is one of the popular medicinal plants. The plant has many pharmaceutical uses in traditional medicine. In this study, cobalt nanoparticles were synthesized according to green chemistry rules using the aqueous extract of Linum usitatissimum. The green-synthesized CoNPs@ L. usitatissimum were characterized using different techniques such as EDX, FE-SEM, XRD, and FT-IR. The FE-SEM results confirm spherical morphology for the nanoparticles with size of 38.42 to 75.26 nm. The properties of CoNPs@ L. usitatissimum against common human esophageal cancer cell lines i.e. KYSE-270, OE33, ESO26 and FLO-1 were evaluated. The antioxidant test with DPPH free radical indicates the significant antioxidant properties of CoNPs@ L. usitatissimum. The IC50 of the CoNPs@ L. usitatissimum was 359, 176, 371, and 387 against KYSE-270, OE33, ESO26 and FLO-1, respectively. It seems that the anti-human esophageal cancer effect of cobalt nanoparticles mediated by Linum usitatissimum leaf aqueous extract is due to their antioxidant effects.

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