

In Vitro Anticancer Activity of Au, Ag Nanoparticles Synthesized Using *Commelina nudiflora* L. Aqueous Extract Against HCT-116 Colon Cancer Cells

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ABSTRACT

Recently, metal nanoparticles have been getting great medical and social interests due to their potential physico-chemical properties such as higher affinity, low molecular weight, and larger surface area. The biosynthesized gold and silver nanoparticles are spherical, triangular in shape with an average size of 24–150 nm as reported in our earlier studies. The biological properties of synthesized gold and silver nanoparticles are demonstrated in this paper. The different in vitro assays such as MTT, flow cytometry, and reverse transcription polymerase chain reaction (RT-qPCR) techniques were used to evaluate the in vitro anticancer properties of synthesized metal nanoparticles. The biosynthesized gold and silver nanoparticles have shown reduced cell viability and increased cytotoxicity in HCT-116 colon cancer cells with IC₅₀ concentration of 200 and 100 µg/ml, respectively. The flow cytometry experiments revealed that the IC₅₀ concentrations of gold and silver nanoparticle-treated cells that have significant changes were observed in the sub-G1 cell cycle phase compared with the positive control. Additionally, the relative messenger RNA (mRNA) gene expressions of HCT-116 cells were studied by RT-qPCR techniques. The pro-apoptotic genes such as PUMA (++), Caspase-3 (+), Caspase-8 (++), and Caspase-9 (++) were upregulated in the treated HCT-116 cells compared with cisplatin. Overall, these findings have proved that the synthesized gold and silver nanoparticles could be potent anti-colon cancer drugs.

KEYWORDS: Gold nanoparticles; Silver nanoparticles; HCT-116; Apoptosis; RT-qPCR

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