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Biogenic gold nanoparticles from indole-3-carbinol exhibit antineoplastic effects through the induction of apoptosis

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In recent years, biogenic metal nanoparticles using phytochemicals are exhibiting better solubility, enhanced biocompatibility, reduced toxic effects to healthy cells and improved tumor specificity due to their distinctive physico-chemical properties. Gold nanoparticles have fascinated immense scientific and technological interest due to their easy synthesis and chemical stability. Indole-3-carbinol is plentiful in cruciferous vegetables, such as cabbage, and cauliflower. The present study was designed to synthesize biogenic gold nanoparticles using indole-3-carbinol (AuNPI3Cs) and to investigate its antineoplastic activities. Characterization was done by UV-visible spectrum, dynamic light scattering (DLS), transmission electron microscopy (TEM). UV visible spectroscopy confirmed the stability of gold nanoparticles. TEM analysis study exhibited that AuNPI3Cs were mostly spherical in shape with an average particle size of 3 nm. The present study describes the *in vitro* antineoplastic efficacy of AuNPI3Cs against Ehrlich ascites carcinoma (EAC) cells. Results confirmed that the IC₅₀ dose of AuNPI3Cs was significantly capable of elevating intracellular reactive oxygen species. AuNPI3Cs induced apoptosis by increasing the G₂/M population, chromatin condensation, DNA laddering. Reduction of the mitochondrial potential by AuNPI3Cs was substantiated by rhodamine 123 staining. These findings confirm the cytotoxic, apoptosis and anticancer efficacy of AuNPI3Cs through their oxidative stress producing capability.

Biography

Rini Ghosh has completed her Master's degree in Physiology from Vidyasagar University, Midnapore. She was awarded Doctor of Philosophy in 2017 from Vidyasagar University, Midnapore. She has some good quality research publications in peer reviewed journals and doing active research works.

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