

Mechanistic anticarcinogenic efficacy of phytofabricated gold nanoparticles on human lung adenocarcinoma cells

ABSTRACT

The present study deals with *Plectranthus amboinicus* (Lour.), multiple potential herbs perceived as a medicinal and culinary adjunct has been used to fabricate gold (Au) nanoparticles (NPs) in an eco-benign fashion. We have primly reported the antioxidant and anticarcinogenic effects of phytofabricated Au NPs towards lung adenocarcinoma (LAC) cells (A549 cell line) in vitro. The herbal concentrate, size and dosage of Au NPs were the key variables that determined the anticarcinogenic efficacy. Results indicated that the herbal concentrate encompassing flavonoids, alkaloids and polyphenolics aided reduction and stabilisation of Au NPs supported by spectral (λ_{max} @ 550 nm) and quantitative analyses. The Fourier transform-infrared spectra anticipated distinct phenolics and protein frequencies involved in Au NPs capping in the course of fabrication. The manipulated Au NPs of 15 nm size has significantly influenced the radical scavenging (48.1 μg) and proliferation pattern of LAC cells (A549) associated with cytotoxic characteristics and IC₅₀ (Au NPs concentration linked with 50% mortality) defined at 16.3 $\mu\text{g}/\text{mL}$ in 48 h. This nanotoxicological prospect on the use of nanomaterials as an anticancer agent would be an alternative for the emerging intrinsic resistance of cells to the drug; a great challenge pertaining to safer environmental and biological outcomes.

Keyword: *Plectranthus amboinicus*; Gold nanoparticles; Phytofabrication; Human lung adenocarcinoma; A549 cells; MTT assay