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Synthesis of Biostabilized Gold Nanoparticles Using Garcinia indica Extract and Its Antimicrobial and Anticancer Properties

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Abstract : Chemical synthesis of nanoparticles produces toxic by-products, as a result of which eco-friendly methods of synthesis are gaining importance. The synthesis of nanoparticles using plant derived extracts is economical, safe and eco-friendly. Biostabilized gold nanoparticles were synthesized using extracts of Garcinia indica. The gold nanoparticles were characterized using UV-Vis spectrophotometry and demonstrated a peak at 527 nm. The presence of plant derived peptides and phytoconstituents was confirmed using the FTIR spectra. TEM analysis revealed formation of gold nanopyramids and nanorods. The SAED analysis confirmed the crystalline nature of nanoparticles. The gold nanoparticles demonstrated antibacterial and antifungal activity against Escherichia coli, Staphylococcus aureus, Bacillus subtilis, Aspergillus niger and Pichia pastoris. The cytotoxic activity of gold nanoparticles was studied using HEK, Hela and L929 cancerous cell lines and the apoptosis of cancerous cells were observed using propidium iodide staining. Thus, a simple and eco-friendly method for synthesis of biostabilized gold nanoparticles using fruit extracts of Garcinia indica was developed and the nanoparticles had potent antibacterial, antifungal and anticancer properties.

Keywords : cytotoxic, gold nanoparticles, green synthesis, Garcinia indica, anticancer
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