

Designing Modified Nanocarriers Containing Selenium Nanoparticles Extracted from the Lactobacillus acidophilus and Their Anticancer Properties

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Abstract : This study synthesized new modified imaging nanocapsules (NCs) of gallium@deferroxamine/folic acid/chitosan/polyaniline/polyvinyl alcohol (Ga@DFA/FA/CS/PANI/PVA) containing Morus nigra extract by selenium nanoparticles prepared from Lactobacillus acidophilus. Se nanoparticles were then deposited on (Ga@DFA/FA/CS/PANI/PVA) using the impregnation method. The modified contrast agents were mixed with M. nigra extract, and their antibacterial activities were investigated by applying them to L929 cell lines. The influence of variable factors including surfactant, solvent, aqueous phase, pH, buffer, minimum Inhibitory concentration (MIC), minimum bactericidal concentration (MBC), cytotoxicity on cancer cells, antibiotic, antibiogram, release and loading, stirring effect, the concentration of nanoparticle, olive oil, and thermal methods was investigated. The structure and morphology of the synthesized contrast agents were characterized by zeta potential, size analysis (ZPS), X-Ray diffraction (XRD), Fourier-transform infrared (FT-IR), and energy-dispersive X-ray (EDX), ultraviolet-visible (UV-Vis) spectra, and scanning electron microscope (SEM). The experimental section was conducted and monitored by response surface methods (RSM) and MTT conversion assay. Antibiogram testing of NCs on Pseudomonas aeruginosa bacteria was successful, and the MIC=2 factor was obtained with a less harmful effect.

Keywords : imaging contrast agent, nanoparticles, response surface method, Lactobacillus acidophilus, selenium

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