

Biosynthesis of Selenium Oxide Nanoparticles by *Streptomyces bikiniensis* and Its Cytotoxicity as Antitumor Agents against Hepatocellular and Breast Cells Carcinoma

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Abstract : In this paper, we reported that selenium (Se) nanoparticles were firstly biosynthesized with a simple and eco-friendly biological method. Their shape, size, FTIR (Fourier Transform Infrared spectroscopy), UV-vis spectra, TEM (Transmission Electron Microscopy) images and EDS (Energy Dispersive Spectroscopy) pattern have been analyzed. TEM analyses of the samples obtained at different stages indicated that the formation of these Se nanostructures was governed by an incubation time (12- 24- 48 hours). The Se nanoparticles were initially generated and then would transform into crystal seeds for the subsequent growth of nanowires; however obtaining stable Se nanowire with a diameter of about 15-100 nm. EDS shows that Se nanoparticles are entirely pure. The IR spectra showed the peaks at 550 cm⁻¹, 1635 cm⁻¹, 1994 cm⁻¹ and 3430 cm⁻¹ correspond to the presence of Se-O bending and stretching vibrations. The concentrations of Se-NPs (0, 1, 2, 5 µg/ml) did not give significantly effect on both two cell lines while the highest concentrations (10- 100 µg/ml) gave significantly effects on them. The lethal dose (ID50%) of Se-NPs on Hep2 G and MCF-7 cells was obtained at 75.96 and 61.86 µg/ml, respectively. Results showed that Se nanoparticles as anticancer agent against MCF-7 cells were more effective than Hep2 G cells. Our results suggest that Se-NPs may be a candidate for further evaluation as a chemotherapeutic agent for breast and liver cancers.

Keywords : selenium nanoparticle, *Streptomyces bikiniensis*, nanowires, chemotherapeutic agent

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