

Rapid Green Synthesis of Silver Nanoparticles Using Solanum Nigrum Leaves Extract with Antimicrobial and Anticancer Properties

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Abstract : In this work, silver nanoparticles (AgNP) were manufactured directly without harmful chemicals utilising methanol extract (SNLME) Solanum nigrum leaves. We are using nigrum leaf extract from Solanum, which converts silver nitrate to silver ions, for synthesization purposes. An examination of the AgNP produced was performed using ultraviolet (UV-VIS) spectroscopy, infrared spectroscopy (FTIR) transformed from Fourier and scanning electrons (SEM). Biological activity was also tested. UV-VIS has proven that biosynthesized AgNP exists (420-450 nm). The FTIR spectrum has been utilised to confirm the presence of different functional groups within the biomolecules, which are a nanoparticulate capping agent and the spectroscopic and crystal nature of AgNP. The viability of the silver nanoparticles was evaluated using zeta potential calculations. Negative zeta potential of -33.4 mV demonstrated the stability of silver-nanoparticles. The morphology of AgNP was examined using a scanning electron microscope. Greenly generated AgNP showed significant anti-Staphylococcus aureus, Candida, and Escherichia coli action. The green AgNP demonstration indicated that the IC50 for the human teratocarcinoma cell line was 29.24 µg/ml during 24 hours of therapy (PA1 Ovarian cell line). The dose-dependent effects were reported in both antibacterial and cytotoxicity assays and as an effective agent. Finally, the findings of this research showed that silver nanoparticles generated might serve as a viable therapeutic agent to combat microorganisms killing and curing cancer.

Keywords : antimicrobial activity, PA1 ovarian cancer cell line, silver nanoparticles, Solanum nigrum

Conference Title : ICBN 2021 : International Conference on Biotechnology and Nanobiotechnology

Conference Location : San Francisco, United States

Conference Dates : June 07-08, 2021