

Biosurfactant-Mediated Nanoparticle Synthesis by *Bacillus subtilis*

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Abstract : Silver nanoparticles have a broad range of antimicrobial and antifungal properties ranging from soaps, pastes to sterilization and drug delivery systems. These can be synthesized by physical, chemical and biological methods; biological methods being the most popular owing to their non-toxic nature and reduced energy requirements. Microbial surfactants, produced on the microbial cell surface or excreted extracellularly are an alternative to synthetic surfactants for the production of silver nanoparticles. Hence, they are also called as green molecules. Microbial lipopeptide surfactants (biosurfactant) exhibit anti-tumor and anti-microbial properties and can be used as drug delivery agents. In this study, biosurfactant was synthesized by using a strain of *Bacillus subtilis*. The biosurfactant thus produced was analysed by emulsification assay, oil spilling test, and haemolytic test. Biosurfactant-mediated silver nanoparticles were synthesised by microwave irradiation of the culture supernatant and further characterized by UV-vis spectroscopy for a range of 400-600 nm. The UV-vis spectra showed a surface plasmon resonance vibration band at 410 nm corresponding to the peak of silver nanoparticles.

Keywords : biosurfactant, *Bacillus subtilis*, silver nano particle, lipopeptide

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