

ANTIBACTERIAL EFFICACY OF EXTRACELLULAR SILVER NANOPARTICLES BIOFABRICATED FROM CHROMIUM REDUCING BACTERIA

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ABSTRACT

Use of microbes is very promising approach for the synthesis of technology based, ecofriendly, cost effective and biocompatible nanoparticles possessing unique physical and chemical properties is one of the developments in nanobiotechnology. Bacterial flora obtained from the tannery effluent was identified as *Pseudomonas putida*. Biosynthesis of silver nanoparticles (AgNPs) by using culture supernatant of *P. putida* was investigated and the formation of silver nanoparticles was confirmed by the change in colour of the culture filtrate from yellow to brown. Furthermore, the silver nanoparticles were characterized by means of UV-Visible spectroscopy and it showed absorption peak at around 440 nm which corresponds to the Plasmon resonance of silver nanoparticles. The XRD pattern showed the presence of sharp reflections at (111), (200), (220), (311) which indicate the presence of biological synthesis of silver nanoparticles. The Scanning electron micrograph showed the spherical natures of particles have size ranged from 20-100 nm and possess an average size of 60 nm. A highly significant antimicrobial activity against pathogenic bacteria by the bio fabricated Ag NPs was also revealed by the highest zone of inhibition of 20 mm dia. Therefore, this novel bacterial strain could be used for biofabrication of AgNPs and ultimately in the nanoparticle based drug formulation for the treatment of bacterial diseases.

KEYWORDS: Biofabrication, Bacteria, Chromium, *Pseudomonas Putida*, Silver Nanoparticle