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Insight into eco-friendly fabrication of silver nanoparticles by *Pseudomonas aeruginosa* and its potential impacts

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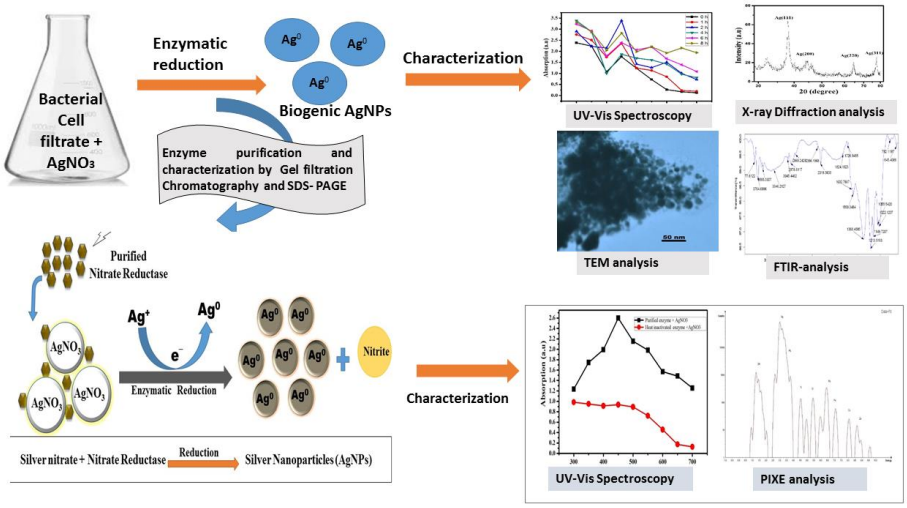
Graphical abstract



Abstract.

Although green synthesis of nanoparticles (NPs) has replaced conventional physicochemical methods owing to eco-friendly and cost effective nature but molecular mechanism is not known completely. Elucidation of the mechanism is needed to enhance the production of control size synthesis and for understanding the biomineralization process. Here we report the facile, extracellular biosynthesis of silver nanoparticles (AgNPs) by *Pseudomonas aeruginosa* JP1 through nitrate reductase mediated mechanism. $AgNO_3$ was reduced to AgNPs by cell filtrate exposure. UV-visible spectrum of the reaction mixture depicted reduction of ionic silver (Ag^+) to atomic silver (Ag^0) by a progressive upsurge in surface plasmon resonance (SPR) band range 435-450 nm. X-ray diffraction analysis showed the 2θ values at 38.08°, 44.52°, 64.42° and 77.44° confirming the crystalline nature and mean diameter [6.5-27.88nm (Ave = 13.44 nm)] of AgNPs. Transmission electron microscopy analysis demonstrated the spherical AgNPs with