

## Fungal mediated synthesis, structural characterization and antimicrobial activity of silver and gold nanoparticles

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**Abstract:** An eco-friendly approach was employed to synthesize monodispersed and crystalline silver and gold nanoparticles using fungal cell extract of the fungus, *Candida albicans*. As synthesized Ag NPs and Au NPs were characterized by XRD, TEM, and UV-Vis spectroscopy. The formation of silver and gold nanoparticles was confirmed by the appearance of surface plasmon resonance (SPR) peaks at 540 nm and 450 nm respectively. TEM shows the formation of Ag NPs and Au NPs of average sizes of 30 nm and 5 nm respectively. The surface area of the Ag NPs and Au NPs was found to be 184 m<sup>2</sup>/g and 19 m<sup>2</sup>/g respectively. The capping action and the corresponding stabilizing action of the biomolecules like proteins and peptides in the cell free extract were confirmed by the FTIR and thermal gravimetric analysis (TGA). The biocidal action of the silver and gold nanoparticles was also investigated against *Staphylococcus aureus* and *Escherichia coli*. The results suggest the higher antimicrobial activity of Ag NPs as compared to Au NPs with both the type of nanoparticles showing greater inhibitory action against *E. coli*, a gram negative bacterium than *S. aureus*, a gram positive bacterium.

