


Abstract

The study was conducted in order to synthesize silver nanoparticles from the probiotic bacterium *Bacillus licheniformis*. The probiotic was taken from the culture bank of the Institute of Industrial Biotechnology, Government College University, Lahore. Bacterial strain was inoculated on nutrient agar and was identified by various biochemical tests like gram staining, citrate test, catalase test, and *voges proskauer* test. The strain gave a purple-colored rod appearance under the microscope and produced bubbles when the colonies were treated with Hydrogen peroxide. It gave blue color in Simon Citrate Agar and red color in MRVP broth. Various techniques were used to characterize nanoparticles like UV-Vis, FTIR, and XRD. In UV-Visible, *AgNPs* showed a high peak on 434 nm wavelength which shows the synthesis of silver nanoparticles. Purified silver nanoparticles were subjected to FTIR analysis by scanning them to obtain spectra from which the chemical nature of particles can be justified. FTIR analysis report showing different peaks of Amine stretching, Amide bending, C-H, C-N stretching at 3387, 1643, 2123 and 896 respectively. X-ray Diffraction report gave peaks at the values of 38.65°, 44.49°, 64.79°, and 78.12°, corresponding to 111, 200, 220, and 311 planes for silver, respectively, which confirms that the particles formed in our experiments were *nanocrystals*, as it shows evidence by showing peaks at 2 theta values of 38.65°, 44.48°, 64.79°, and 78.12°, respectively. So based on results the study indicates that *AgNPs* made by *Bacillus licheniformis* are of good quality and can replace the other nanoparticles which are made by chemical or physical processes. It will be ecofriendly, cost effective, and can be used for therapeutic or diagnostic purposes.  (Ctrl) ▾