

## Ag-CuO nanoparticles: biosynthesis by *Staphylococcus aureus* and *Pseudomonas stutzeri* bacteria and antibacterial properties

Nasrin Ghasemi<sup>1, 2</sup>

Roya Zekavati<sup>3\*</sup>

Farid Jamali-Sheini<sup>4</sup>

1. Department of Microbiology,  
Fars Science and Research  
Branch, Islamic Azad University,  
Shiraz, Iran

2. Department of Microbiology,  
Shiraz Branch, Islamic Azad  
University, Shiraz, Iran

3. Department of Microbiology,  
Islamic Azad University, Ahvaz  
Branch, Ahvaz, Iran

4. Advanced Surface Engineering  
and Nano Materials Research  
Center, Department of Physics,  
Islamic Azad University, Ahvaz  
Branch, Ahvaz, Iran

**\*Corresponding author:**

rzekavati45@gmail.com

**Received date:** 2017/01/02

**Reception date:** 2017/08/20

### Abstract

The Ag-CuO nanoparticles were synthesized by using biological method. The biosynthesis was performed by using bacteria route. Aim of this study is synthesis and characterization of Ag-CuO nanoparticles and investigation of antibacterial properties. Structure, morphology and the optical properties of the synthesized particles were studied. The x-ray diffraction (XRD) patterns of the Ag-CuO nanoparticles confirmed the produced materials. Electron microscopies studies showed the size of nanoparticles with homogeneous and uniform surface. Energy dispersive spectroscopy (EDS) confirmed the presence of Ag, Cu and O in the produce materials. Also, all samples were characterized by UV-Vis spectroscopies and the results were confirmed by XRD. Additionally, antibacterial property of nanoparticles in compound system was much better than single system.

**Keywords:** Biosynthesis, Ag-CuO NPs, Antibacterial activity.