

**TITLE:** Antibacterial activity of biogenic silver nanoparticles against betalactamases and carbapenemases-producing uropathogenic *Escherichia coli* isolates

**AUTHORS:** CAMARGO, L. C.; SCANDORIEIRO, S.; NAKAZATO, G., KOBAYASHI, R. K. T.

**INSTITUTION:** UNIVERSIDADE ESTADUAL DE LONDRINA, LONDRINA, PR (RODOVIA CELSO GARCIA CID, KM 380, S/N - CAMPUS UNIVERSITÁRIO, CEP 86057-970, LONDRINA - PR, BRAZIL)

**ABSTRACT:**

Bacterial resistance to conventional antimicrobials is a serious clinical and public health problem that challenges the therapeutic decisions of medical teams. Therefore, the research and development of new antimicrobials with the potential to combat multiresistant bacteria are extremely necessary. This study evaluated the antibacterial activity and cytotoxicity of biogenic silver nanoparticles (bio-AgNP). The nanoparticles were produced using silver nitrate as substrate and *Fusarium oxysporum* fungus as reducing power. The minimum inhibitory concentration (MIC) (determined by broth microdilution) and minimum bactericidal concentration (MBC) (determined by counting of CFU/mL) were evaluated against betalactamases and carbapenemases-producing uropathogenic *Escherichia coli* isolates. Bio-AgNP toxicity was assessed against two cell lines (human red blood cells and HEp-2 cells) by determination of 50% cytotoxic concentration (CC50). Bio-AgNP obtained, which had an average diameter of 141.7 nm, were bactericidal for all UPEC isolates, the MIC and MBC values were 125 µM. The MTT assay showed that bio-AgNP were toxic to HEp-2 cells, because CC50 (97 µM) value was higher than MIC value. However, they did not show hemolytic activity. The toxicity results corroborate with other studies describing the antitumor activity of silver nanoparticles, including against HEp-2 cells. This study suggests that bio-AgNP produced using *F. oxysporum* are an alternative strategy for the control of *E. coli* contamination and infections with limited treatment, presenting potential to be applied in industries and clinical environments.

**Keywords:** silver nanoparticles, antibacterial, toxicity, multiresistant.

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