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Single Step Antibiotic Mediated Synthesis of Gold Nanoparticles with Potent Antimicrobial Activity[1] HANNAH RODGERS, RAMMOHAN PARIPELLY, RAJALINGAM DAKSHINAMURTHY, Western Kentucky University — Gentamicin is an aminoglycoside antibiotic with bactericidal activity that works through binding the 30S subunit of the bacterial ribosome, interrupting protein synthesis. In this study gentamicin capped gold nanoparticles (GNP's) were synthesized through a biofriendly, single step process in an aqueous buffer. The GNPs were identified and size was determined with transmission electron microscopy. The average diameters of the particles are 50-10 nm. Further characterization was carried out with UV/vis spectrophotometry, Electron Dispersion Spectroscopy (EDS), and FTIR analysis. Elemental composition of GNP's was determined with EDS. Different antibacterial tests such as Turbidimetry, Spread plate assay, Tetrazolium salt based colorimetric assay and Micro-dilution Alamar blue assays were carried out on both Gram-negative and Gram-positive bacteria to determine the minimum inhibitory concentration of GNP's. Bacterial cross sectioning was performed to document the morphological changes on bacteria caused by the GNP's treatment. The GNP's antimicrobial activity was further confirmed with propidium iodide assay staining the afflicted bacteria. The results are promising since the concentration of GNP's required for minimum inhibition of bacteria was less than that which was compared to the original gentamicin.

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