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## Evaluation of antimicrobial potential of greenly synthesized gold and silver nanoparticles from biomolecules of *Lactobacillus delbrueckii* and nanoparticles functionalized antibiotics against some clinical pathogens

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Biomolecules (Exopolysaccharides and culture free supernatant) from *Lactobacillus delbrueckii* was exploited for facile biosynthesis of gold and silver nanoparticles. The antimicrobial potential of greenly synthesized gold nanoparticles (GNPs) and silver nanoparticles (SNPs) and nanoparticles functionalized with some antibiotics (Ceftriaxone, Streptomycin and Chloramphenicol) against human pathogens was evaluated. Characterization of the nanoparticles was done using UV-visible spectra, Fourier Transformed Infrared Spectroscopy and Scanning Electron Microscopy. Changes in colour from yellow to wine red and yellow to bluish purple is an indication of AuNPs formation from the EPS and CFS while colour change from colourless to brown confirmed SNPs formation. Absorption peaks at 400 nm was observed for the biosynthesized GNPs and SNPs. FTIR shows different functional groups which were responsible for the bio-oxidation and bio-reduction, capping and stabilization of GNPs and SNPs respectively. The SEM analysis showed the biosynthesized nanoparticles to be aggregated with size ranging from 0.4 to 2.8  $\mu$ m. The antimicrobial activity of LDEPSAuNPs, LDCFSAuNPs, LDEPSAuNPs and LDCFSAuNPs ranged from 12 mm – 28 mm, 18 mm – 25 mm, 13 mm – 30 mm and 12 – 28 mm. 55.5% and 44.4% of the test pathogens were susceptible to AuNPs while 100 % of the pathogen were susceptible to SNPs. The NPs showed maximum antagonistic activity against *E. coli* ATCC 35218. The SNPs exhibited higher antagonistic activity than GNPs. Functionalization enhanced the antibacterial efficiency of the antibiotics. This study demonstrated the possibility of using this biomolecules for biosynthesis of GNPs and SNPs and the great potential use of these nanocomposites for the development of novel antimicrobials in biomedical fields.

### Biography

Adeleke Rachael Oluwakamiye is a first year PhD student in the biotechnology and industrial microbiology program, University of Ibadan, Nigeria. Where she is working to proffer solution to the seemingly unending problem faced by industries in the reuse and discharge of wastewater. She is interested in employing biotechnological and nanotechnological approach in mitigating and recycling wastewater discharge from factories/ industries.

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