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Designing a Unique Therapeutic Agent Involving Gold Nanoparticles Capped with Ceftazidime for Potent Antibacterial Applications MONIC SHAH, WILL HAMILTON, VARAVOOT SIRIYUTWATANA, Western Kentucky University — There is a desperate need for making new antibiotics in response to the soaring increase in cases of multi-drug resistant (MDR) bacteria which are prevalently known as "Superbugs." We have tried to design an effective antibacterial agent involving gold nanoparticles (AuNPs) capped with an antibiotic (ceftazidime). By keeping twelve principles of "green chemistry" in mind, an unique, single step process, unlike conventional methods was fabricated for making AuNPs using the combine reducing and capping ability of ceftazidime to yield ceftazidime capped gold nanoparticles (C-AuNPs) which were then characterized using various analytical techniques such as transmission electron microscope (TEM), scanning electron microscope (SEM) and UV-Vis spectroscopy to determine its morphology. Efficiency of C-AuNPs was assessed using several antibacterial assays such as turbidimetry, spread plate method and XTT assay. A variety of bacterial strains involving both Gram-positive and Gram-negative were used for above assays. The minimum inhibition concentration (MIC) of C-AuNPs, obtained from the assays was compared with the MIC of ceftazidime pure drug in order to evaluate the superiority of C-AuNPs over ceftazidime pure drug.

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