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Enhancing Antibiotic Activity Using Nanomaterial-Antibiotic Conjugates

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Presenter Information
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Comments
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Enhancing Antibiotic Activity Using Nanomaterial-Antibiotic Conjugates

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Abstract

We demonstrate that streptomycin conjugated on silica nanoparticles (SNP-Str) can be used to effectively target streptomycin-resistant Escherichia coli (E. coli) bacteria by lowering the minimum inhibitory concentration (MIC) of streptomycin up to 2 log folds. Silica nanoparticles were synthesized with an average diameter of 80, 50 and 30 nm, respectively. Streptomycin was then covalently conjugated to SNP using efficient photocoupling chemistry. The MIC for free streptomycin sulfate was recorded as a high 2.0 mg/mL for an engineered Str' mutant E. coli ORN 208. Conjugating the streptomycin to SNP resulted in the decrease in MIC to 161 μg/mL, 63 μg/mL, and 19 μg/mL for SNP of 80, 50 and 30 nm, respectively. In this poster, the synthesis, characterization, and evaluation of SNP-Str will be presented and discussed.