

Supporting information

Enhanced Antibacterial Activity of Bimetallic Gold-Silver Core Shell Nanoparticle at low silver concentration

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MATERIALS AND METHODS

Chemicals

Silver nitrate and Hydrogen tetrachloroaurate (III) were purchased from Sigma Aldrich chemicals, USA. Ascorbic acid, Cetyl trimethylammonium bromide (CTAB) was obtained from Merck India Pvt. Ltd, Mumbai, India.

GFP Construct

The recombinant GFP-expressing *E. coli* (DH5 α) was generated by cloning the GFP gene into an ampicillin-resistant pUC-derived plasmid vector as described previously.²⁷

Microscopy

The effects of Au@Ag core shell NPs and Ag NPs on GFP-expressing *E. coli* were monitored using a confocal laser scanning microscope (CLSM; Axiovert 200 M, LSM 510 META, Carl Zeiss, Jena, Germany). Drops (5 μ l) of bacterial cultures were placed on microscope slides, air-dried and observed under the microscope. The excitation wavelength was 490 nm, while the observation filter had a long-pass filter operating at wavelengths above 515 nm.

RESULTS

Characterization of Au@Ag core shell NPs

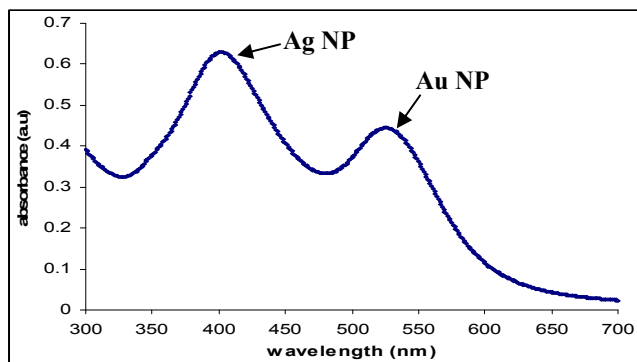


Fig. S1 UV-visible spectra of mixture of AuNPs and AgNPs

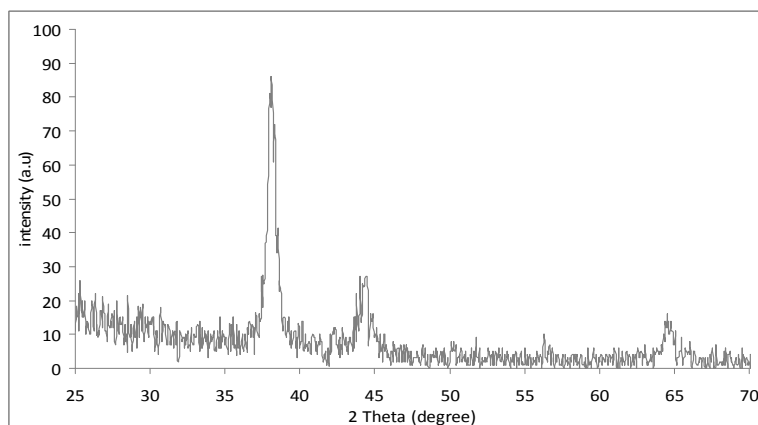


Fig. S2 X-ray diffraction pattern of the Au@Ag core shell

Fluorescence microscopy measurement

Time-dependent fluorescence microscopic studies were performed to observe the effect on bacterial cells following treatment. Fig S3 shows images of cell populations for untreated bacteria (control, A-1,2,3), bacteria treated with Ag NPs (B-1,2,3) and Au@Ag core shell NPs (C-1,2,3) respectively at different time intervals (3, 6 and 12 h). As is apparent in the images, at 3 h there is considerably higher bacterial cell population in control as well as Ag NPs treated

sample as compared to Au@Ag core shell NPs treated sample. The cell population in untreated as well as Ag NPs treated sample increased continuously whereas the core shell NPs treated sample had almost no growth in bacterial cell population.

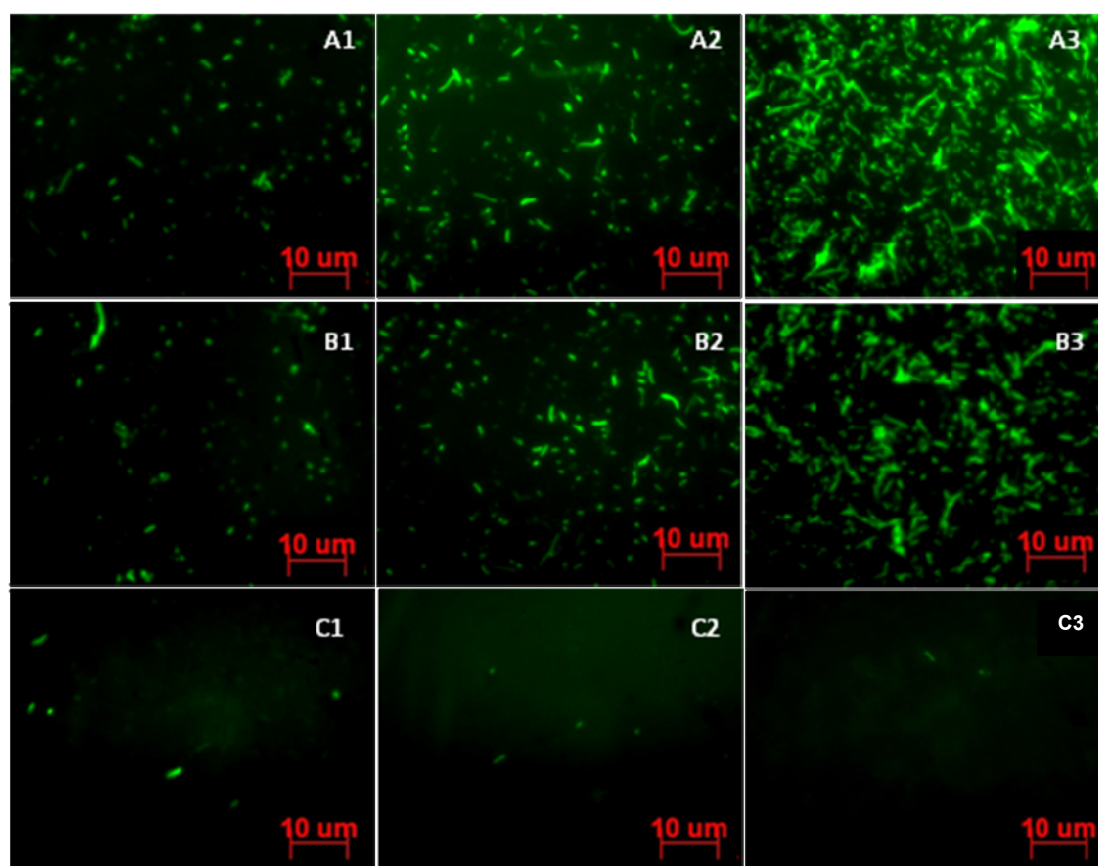


Fig. S3 Time-dependent fluorescence micrograph of GFP recombinant *E. coli*. Series A,B,C refer to control, Ag NPs and Au@Ag core shell NPs (at MIC) treated samples, respectively, while series 1,2,3 refers to the samples at 3, 6 and 12 h time points, respectively.