Supporting Information

Facile Synthesis of Tunable Plasmonic Silver Core/Magnetic Fe₃O₄ Shell Nanoparticles for Rapid Capture and Effective Photothermal Ablation of Bacterial Pathogens

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Figure S1. TEM images of Ag@Fe₃O₄ nanoparticles prepared at different AgNO₃/Fe(NO₃)₃ ratios: a) 1.0, b) 0.8, c) 0.65 , d) 0.4, e) 0.3, and f) 0.25, respectively.
Figure S2. Hysteresis loops of Ag@Fe$_3$O$_4$ and Ag@Fe$_3$O$_4$-PEI nanoparticles.

Figure S3. Zeta potential of *E.coli* BL21 and *S. aures* in ultra-pure water.

Figure S4. The photothermal stability of Ag@Fe$_3$O$_4$-PEI nanoparticles under 25-min irradiation with a 4 W/cm$^2$ 808 nm laser. a) TEM image of the Ag@Fe$_3$O$_4$-PEI nanoparticles before the laser irradiation. b) TEM image of the Ag@Fe$_3$O$_4$-PEI nanoparticles after the laser irradiation. c) UV-Vis-NIR spectra of Ag@Fe$_3$O$_4$-PEI nanoparticles before and after the laser irradiation.
Figure S5. Growth curves of *E. coli* BL21 (a) and *B. subtilis* (b) in LB liquid medium inoculated with $10^7$ CFU/mL (0.02 OD$_{600}$) of bacteria in the presence of different concentrations of Ag@Fe$_3$O$_4$-PEI nanoparticles.

Figure S6. Antibacterial efficiency of Ag@Fe$_3$O$_4$-PEI nanoparticles (50 ppm) against *E. coli* BL21 ($10^7$ CFU/mL, 0.02 OD$_{600}$) under NIR laser irradiation with 10 min for five cycles.