

Supporting Information

Gold nanorods with surface charge switchable activities for enhanced photothermal killing of bacteria and eradication of biofilm

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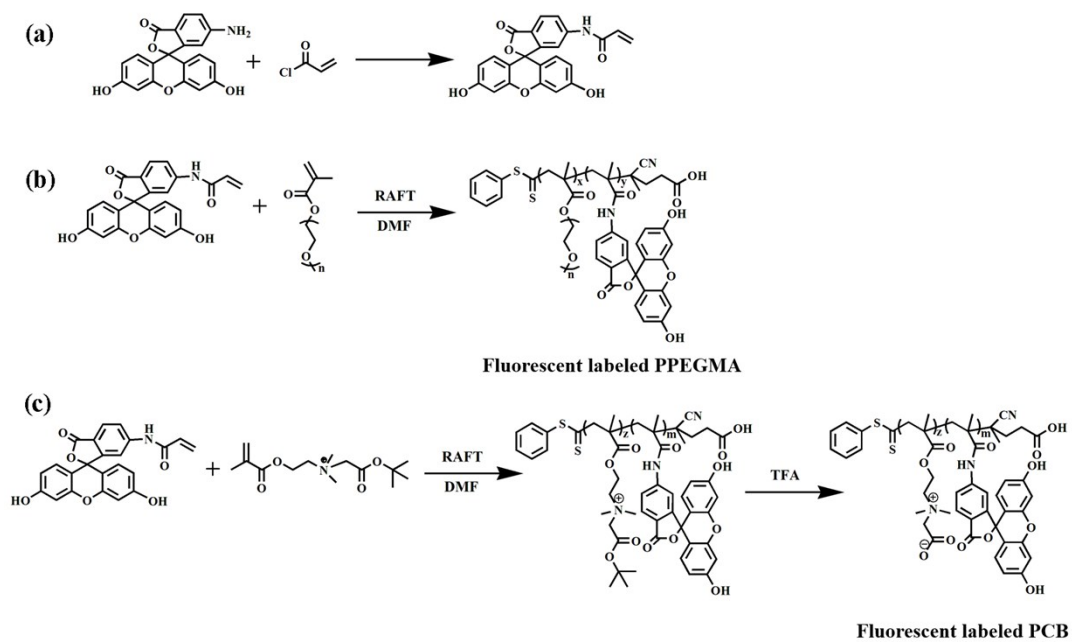
# Z. Qiao and Y. Yao contributed equally to this work

### **Synthesis of PPEGMA and PCB with pendant fluorescein (fluorescent labeled PPEGMA and PCB)**

In order to investigate the penetration depth of AuNRs into biofilms visually by CLSM, fluorescent labeled PPEGMA-AuNRs and PCB-AuNRs were prepared as the same procedure of PCB-AuNRs listed in 2.3, by using the fluorescent labeled PPEGMA and PCB as grafting polymers.

Fluorescent labeled PPEGMA and PCB were synthesized according Scheme S1<sup>[1]</sup>. Typically, 6-Aminofluorescein (0.62 mmol, 0.215 g) was dissolved in NaOH–MeOH solution (1 M) and stirred at 0 °C for 30 min with N<sub>2</sub> protection. Then acryloyl chloride (1.15 mmol, 0.1 g) was added and the reaction mixture was stirred at 0 °C for 12 h. The fluorescent monomer was collected by a filtration and washed three times with diethyl ether.

Reversible addition–fragmentation chain transfer (RAFT) polymerization technique was employed for the synthesis of fluorescence labeled PCB and PPEGMA using similar synthesis process as that of PCB and PPEGMA with the presence of fluorescent monomer.



Scheme S1. Synthesis route of fluorescent labeled PPEGMA and PCB.

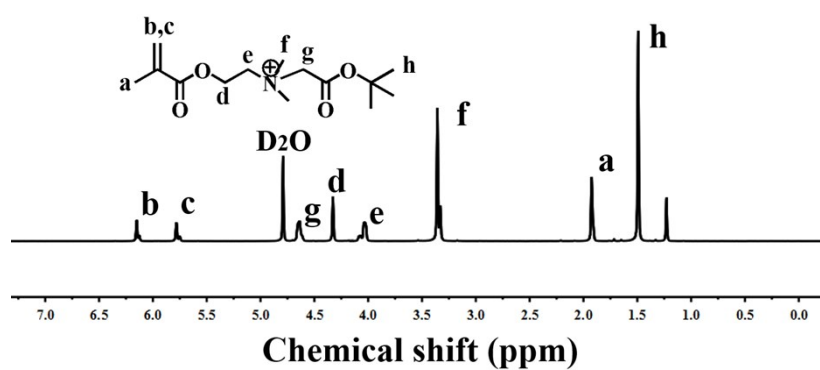


Figure S1.  $^1\text{H}$  NMR spectra of CB-tBu in  $\text{D}_2\text{O}$ .

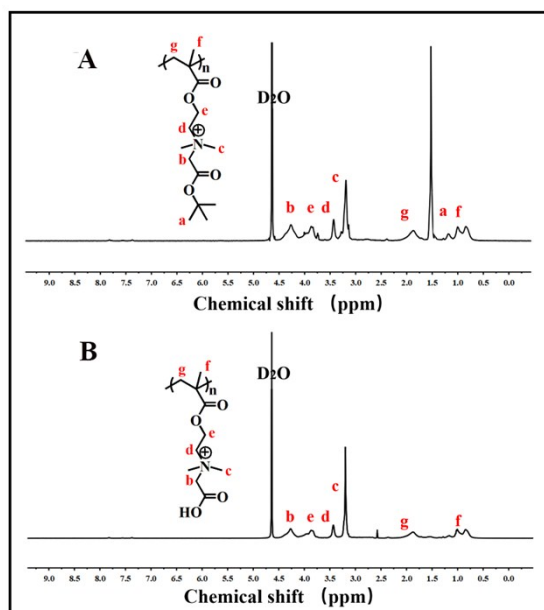


Figure S2.  $^1\text{H}$  NMR spectra of PCB-tBu (A) and PCB (B) in  $\text{D}_2\text{O}$ .

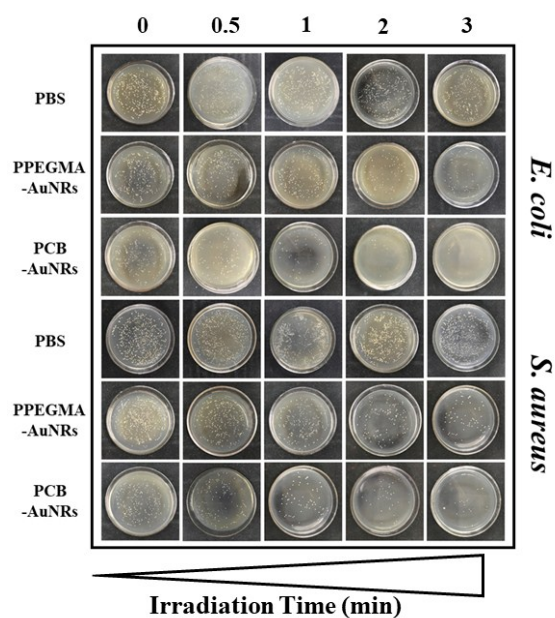


Figure S3. Photos of the bactericidal test of treatment with different NIR irradiation time against *S. aureus* and *E. coli*.

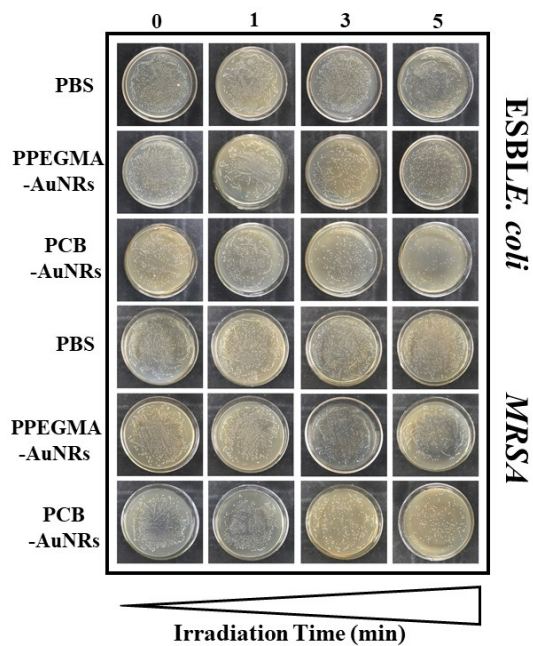


Figure S4. Photos of the bactericidal test of treatment with different NIR irradiation time against  
*ESBL E.coli* and *MRSA*

[1] Li Y, Zhang X, Zhang Z, et al. Tumor-adapting and tumor-remodeling AuNR@dendrimer-assembly nanohybrids overcome impermeable multidrug-resistant cancer[J]. *Materials Horizons*, 2018, 5(6): 1047-1057.