

Supporting Information

Molecular engineering to boost photothermal effect of conjugated oligomer nanoparticles

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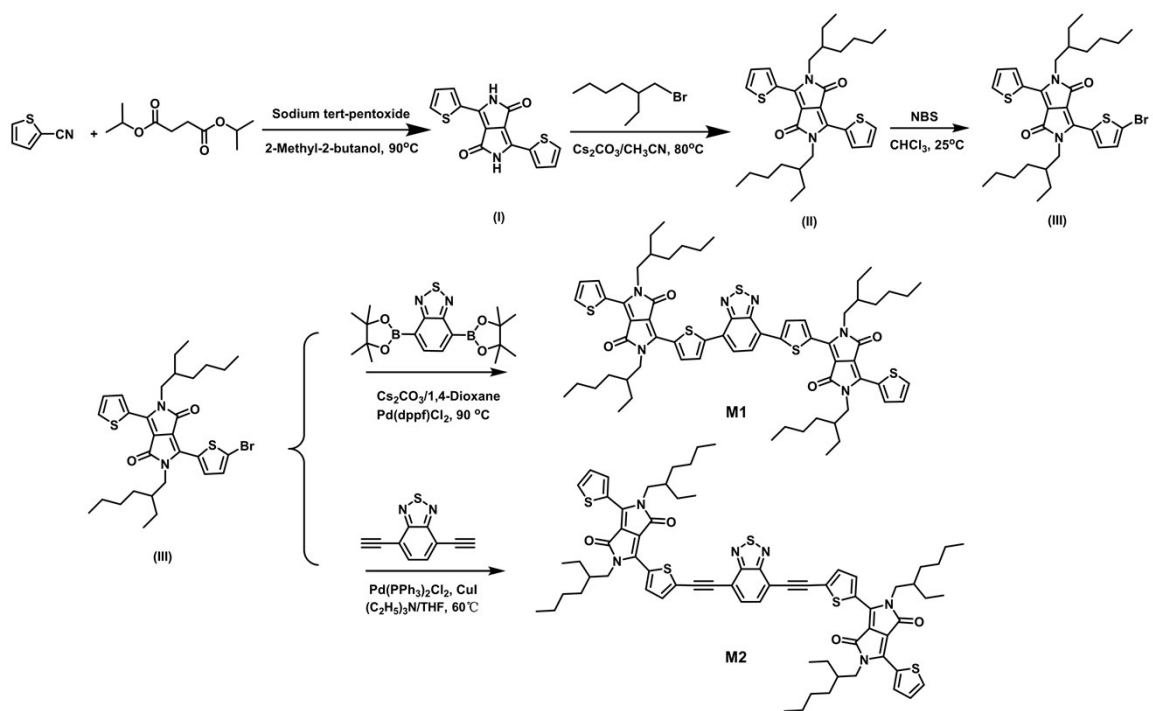


Fig. S1. Synthetic route of oligomers M1 and M2.

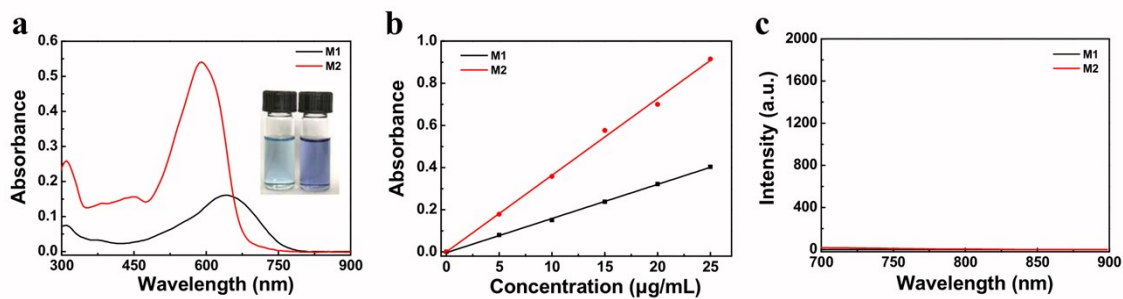


Fig. S2. (a) Absorption spectra of M1 and M2 (10 µg/mL) in THF. The inset shows the photograph of M1 and M2 in THF (10 µg/mL). (b) Absorbance of different concentrations of M1 and M2 at 642 nm in THF. (c) Fluorescence emission spectra of M1 and M2 in THF (10 µg/mL).

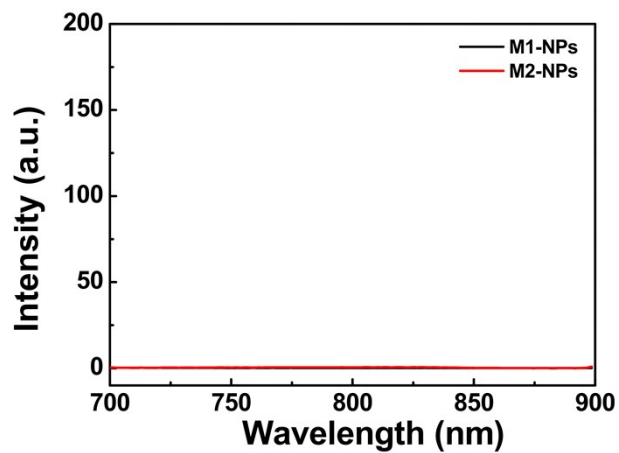


Fig. S3. Fluorescence emission spectra of M1-NPs and M2-NPs in water (10 µg/mL).

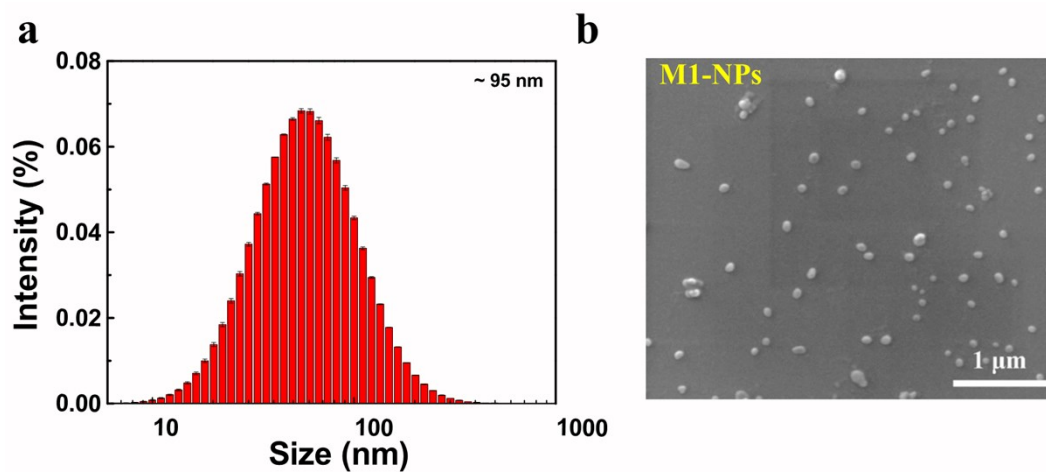


Fig. S4. (a) DLS of M1-NPs in water. (b) SEM image of M1-NPs.

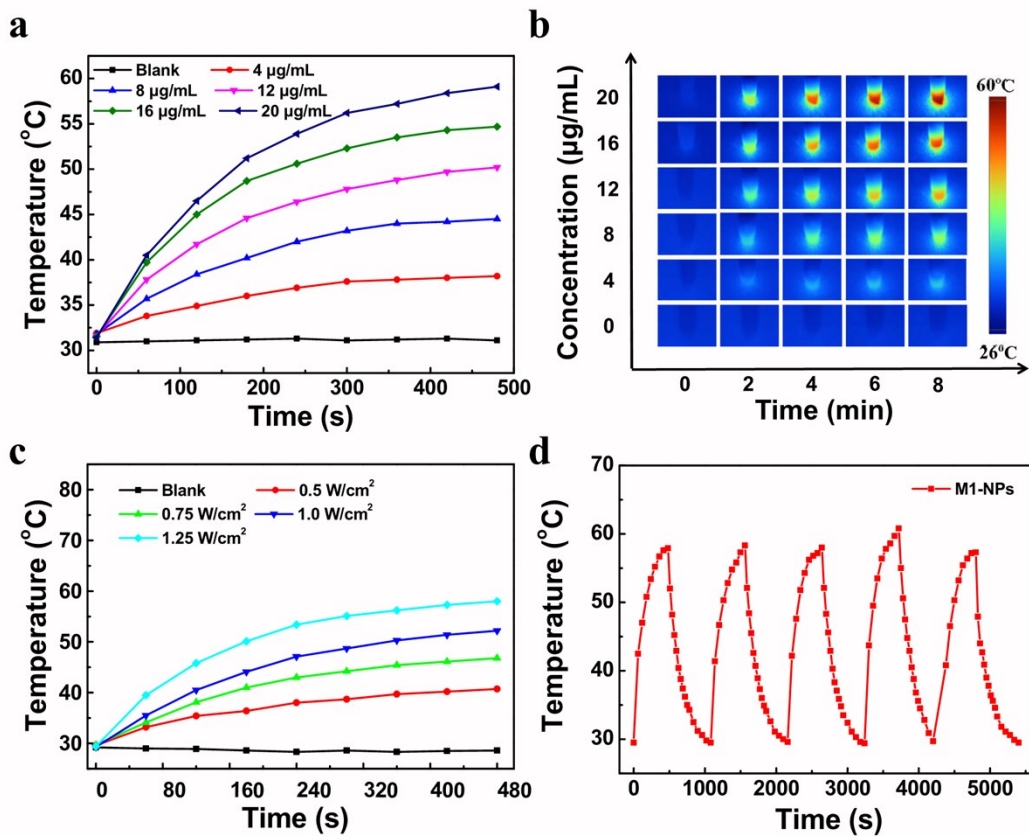


Fig. S5. (a) Temperature curves and (b) thermal images of the M1-NPs aqueous solution with various concentrations under laser irradiation (660 nm, 0.75 W/cm²). (c) Temperature curves of the M1-NPs (10 µg/mL) was illuminated by a 660 nm laser at different power densities. (d) Temperature profiles of M1-NPs (20 µg/mL) for five cycles of ON/OFF laser irradiation (660 nm laser, 0.75 W/cm²).

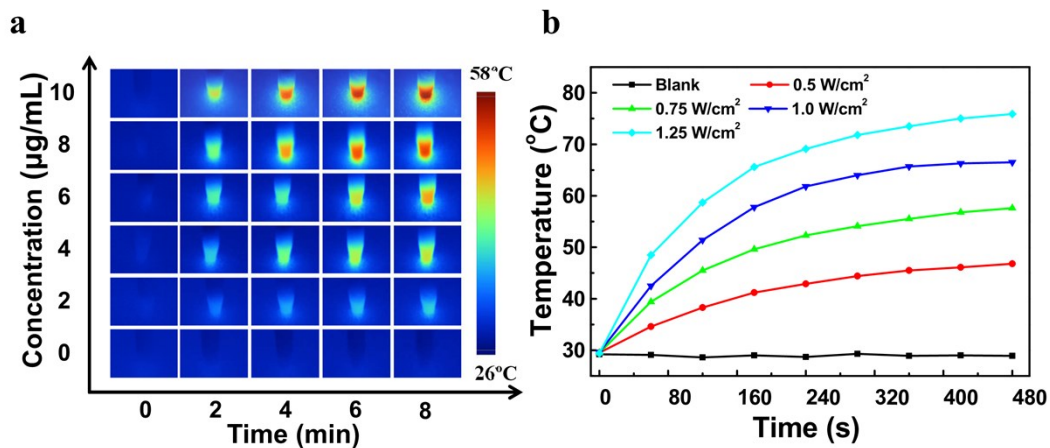


Fig. S6. (a) Thermal images of the M2-NPs with various concentrations under laser irradiation (660 nm laser, 0.75 W/cm²). (b) Temperature elevation of the M2-NPs (10 µg/mL) illuminated by a 660 nm laser at different power densities.

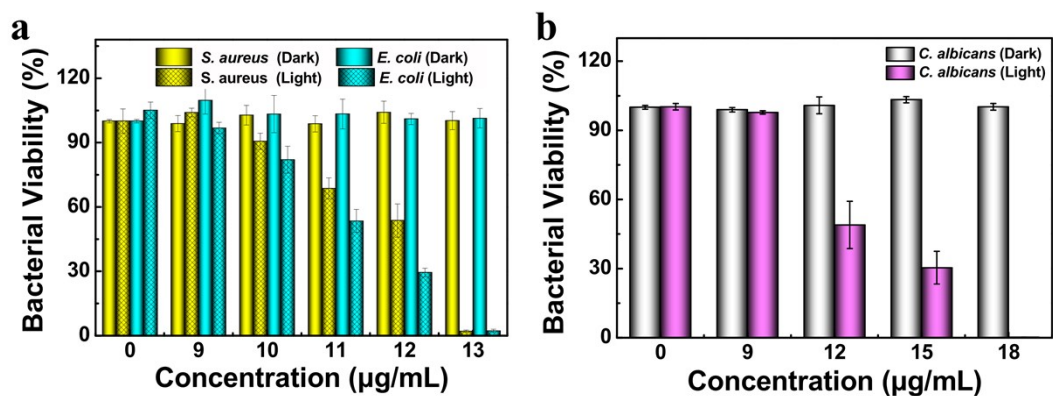


Fig. S7. (a) Antibacterial activity of M1-NPs at different conditions toward Amp^r *E. coli*, *S. aureus* and (b) *C. albicans* in the dark and under 660 nm laser irradiation (0.75 W/cm², 8 min). Data were presented as mean ± SD (n = 3).

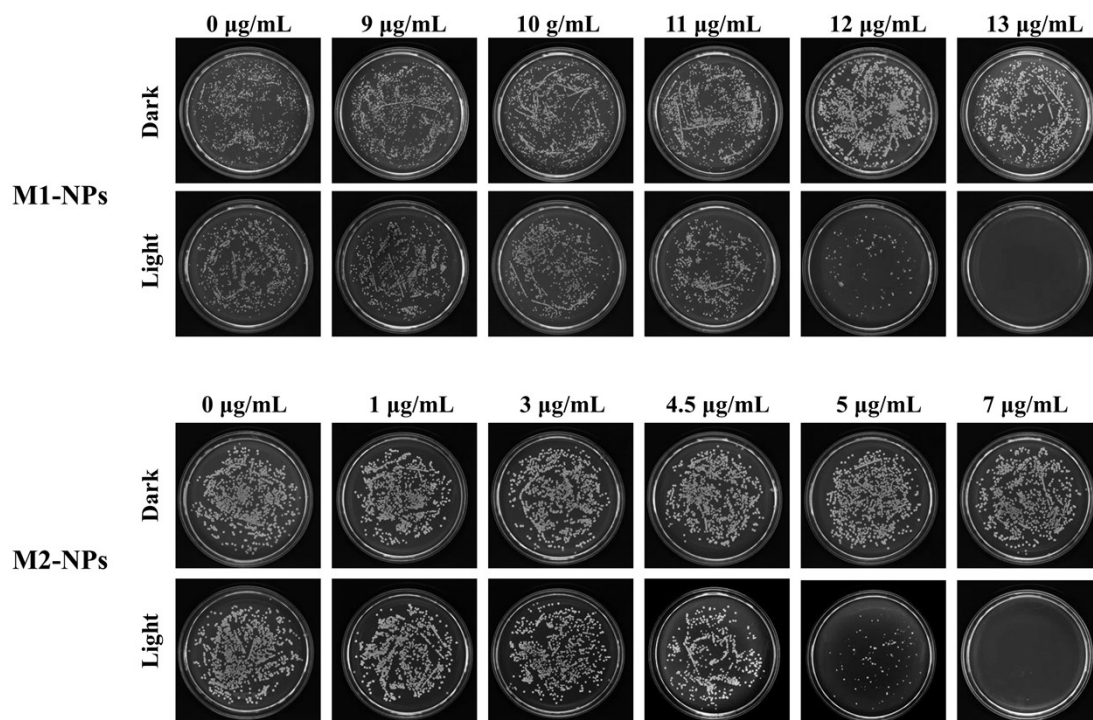


Fig. S8. Photographs of *S. aureus* colonies on the plates after treatment of M1-NPs and M2-NPs at different concentrations with and without light irradiation (660 nm laser, 0.75 W/cm², 8 min).

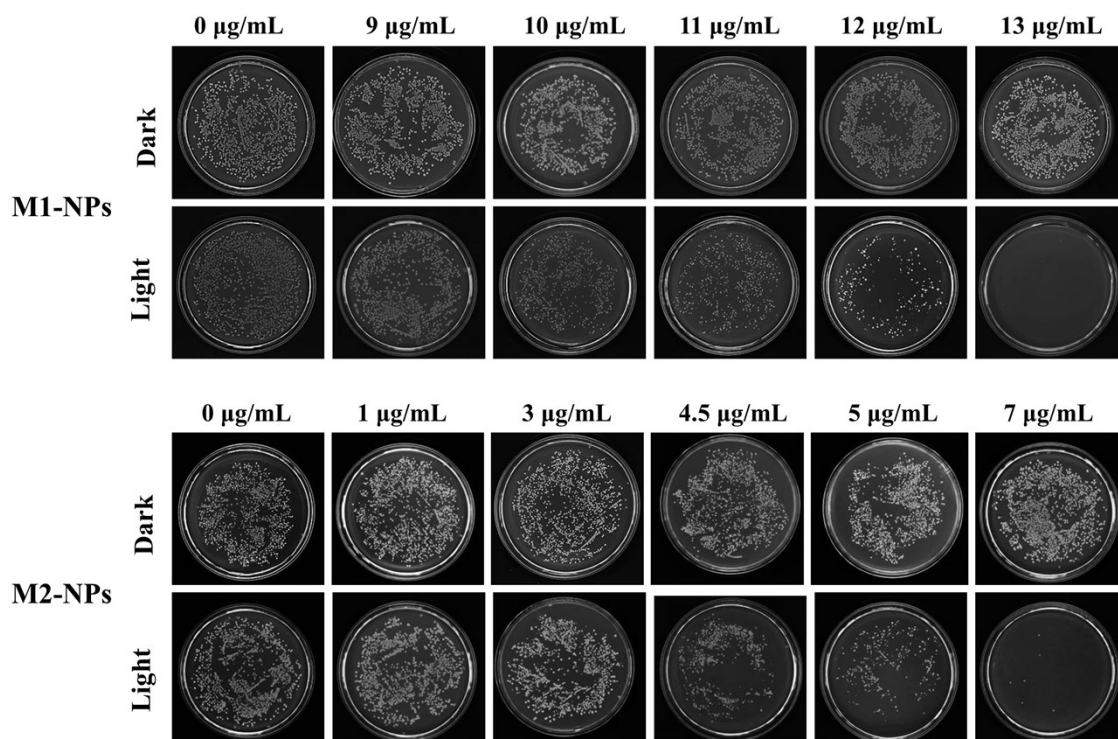


Fig. S9. Photographs of Amp^r *E. coli* colonies on the plates after treatment of M1-NPs and M2-NPs at different concentrations with and without light irradiation (660 nm laser, 0.75 W/cm², 8 min).

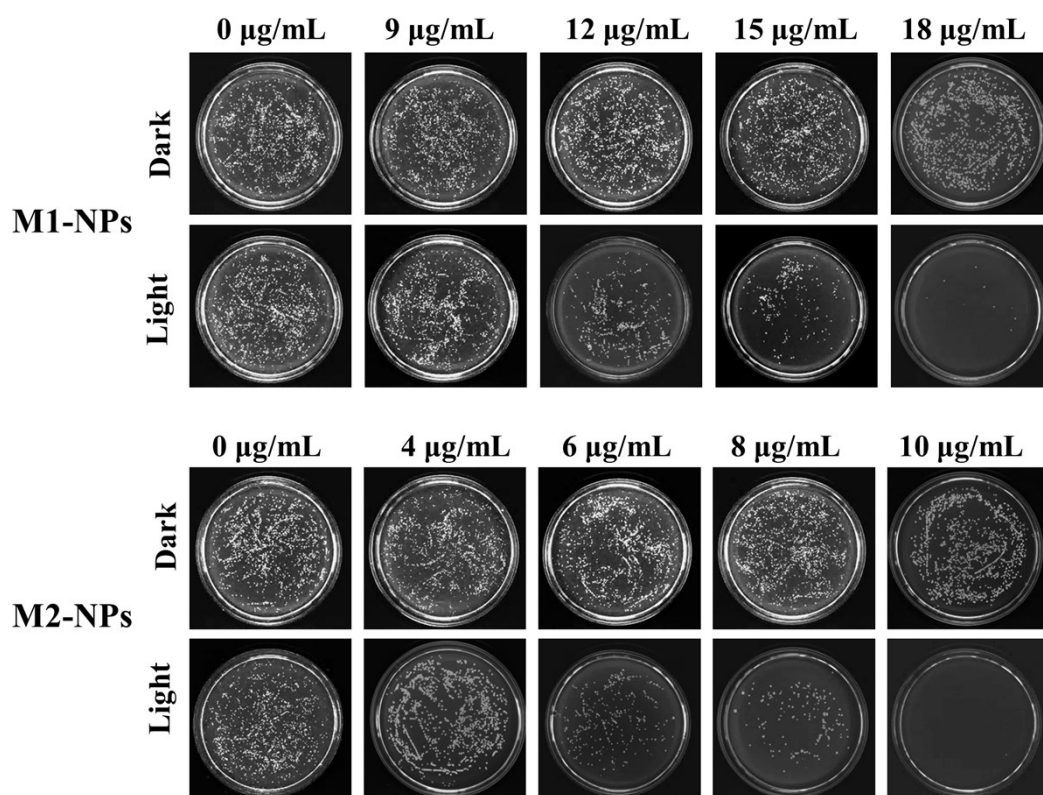


Fig. S10. Photographs of *C. albicans* colonies on the plates after treatment of M1-NPs and M2-NPs at different concentrations with and without light irradiation (660 nm laser, 0.75 W/cm², 8 min).

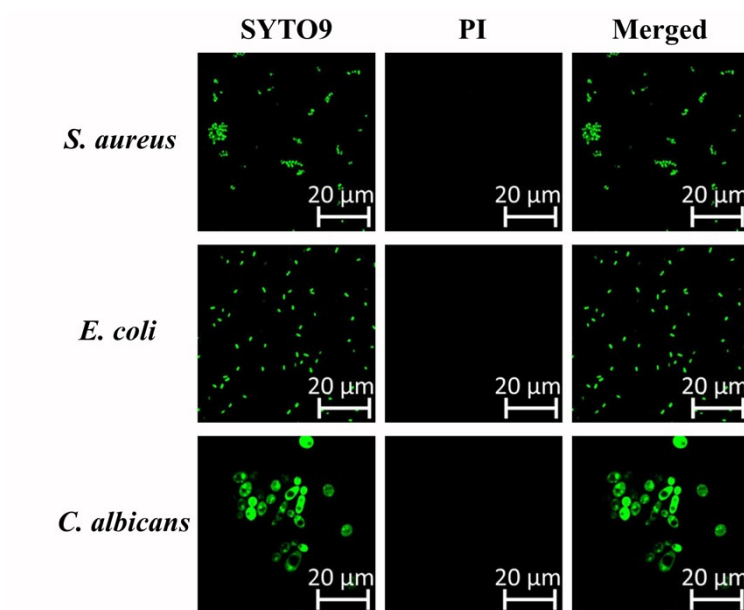


Fig. S11. CLSM images of Amp^r *E. coli*, *S. aureus* and *C. albicans* with treatment of M2-NPs in the dark stained by SYTO9 and PI ([M2-NPs] = 7 μg/mL for Amp^r *E. coli* and *S. aureus*, [M2-NPs] = 10 μg/mL for *C. albicans*).

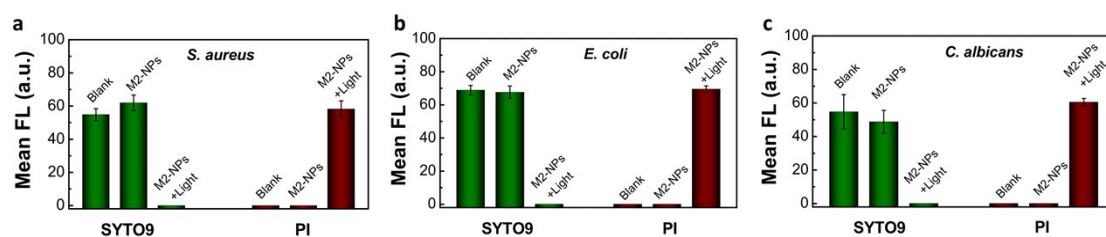


Fig. S12. Mean fluorescence intensities of (a) Amp^r *E. coli*, (b) *S. aureus* and (c) *C. albicans* with and without treatment of M2-NPs in the dark and under 660 nm laser irradiation (0.75 W/cm², 8 min). [M2-NPs] = 7 μg/mL for Amp^r *E. coli* and *S. aureus*, [M2-NPs] = 10 μg/mL for *C. albicans*.

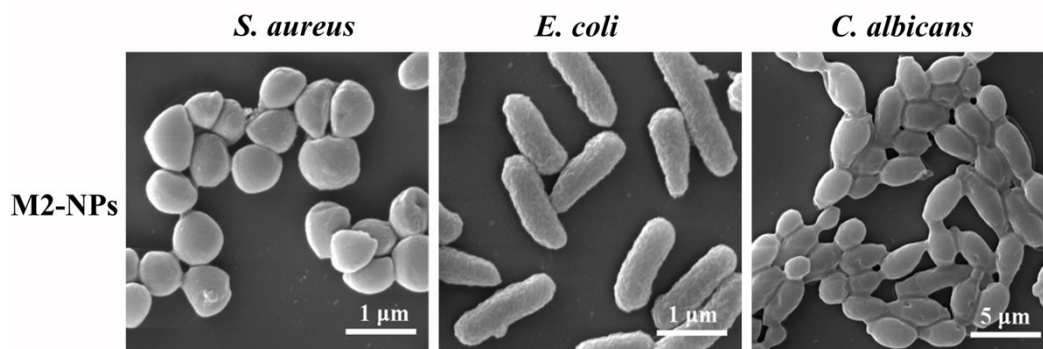


Fig. S13. Representative SEM images of Amp^r *E. coli*, *S. aureus* and *C. albicans* with treatment of M2-NPs in the dark ([M2-NPs] = 7 $\mu\text{g}/\text{mL}$ for Amp^r *E. coli*, *S. aureus*, [M2-NPs] = 10 $\mu\text{g}/\text{mL}$ for *C. albicans*).

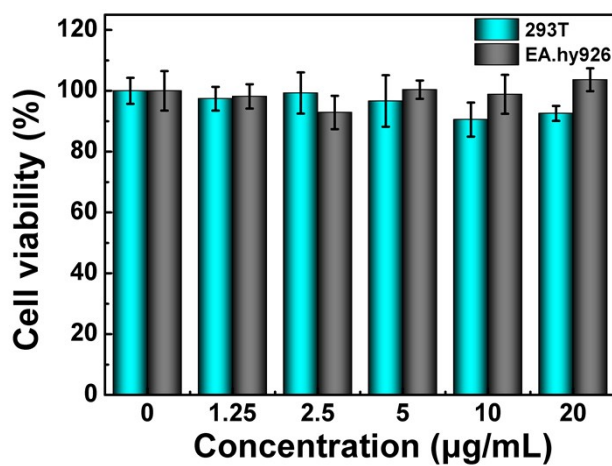


Fig. S14. Cytotoxicity of M1-NPs on mammalian cells 293T and EA.hy926. Data were presented as mean \pm SD (n = 3).

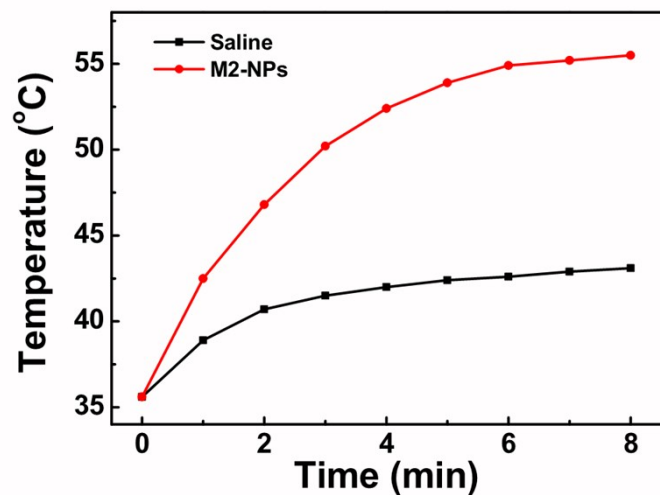


Fig. S15. Photothermal curves of *S. aureus*-infected sites in mice after different treatments: saline + light and M2-NPs + light. The power density of light was 0.75 W/cm² from a 660 nm laser.

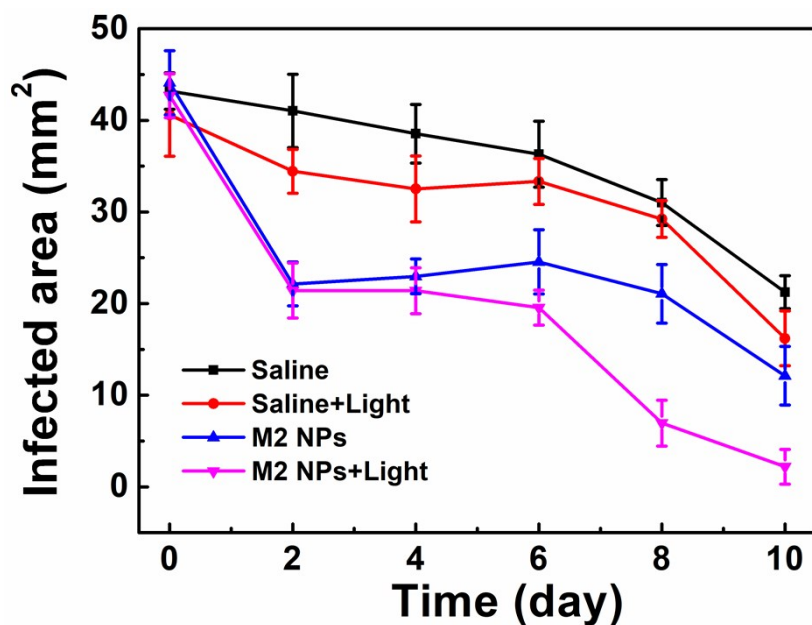


Fig. S16. Changes of wound area after treatment with saline, saline + light, M2-NPs, and M2-NPs + light. The power density of light is 0.75 W/cm², and the irradiation time is 8 min.

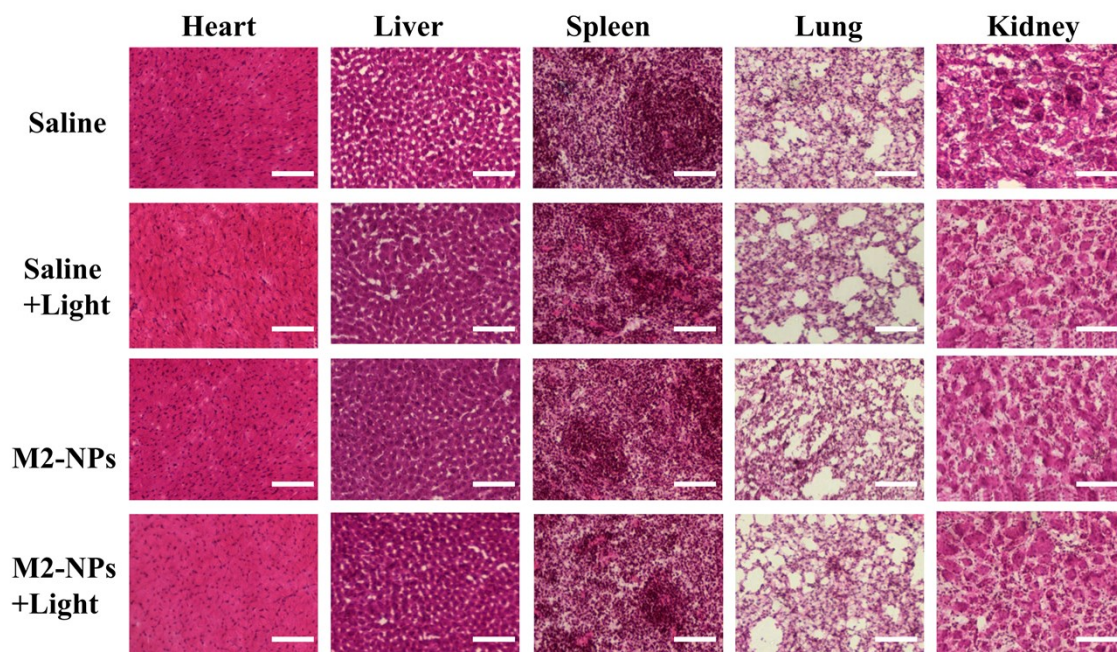


Fig. S17. Images of H&E-stained tissue slices from major organs (heart, liver, spleen, lung, and kidney) of different treatment groups. Scale bar: 100 μ m.