

Supporting Information

An Ag₂S@ZIF-Van nanosystem for NIR-II imaging of bacterial-induced inflammation and treatment of wound bacterial infection

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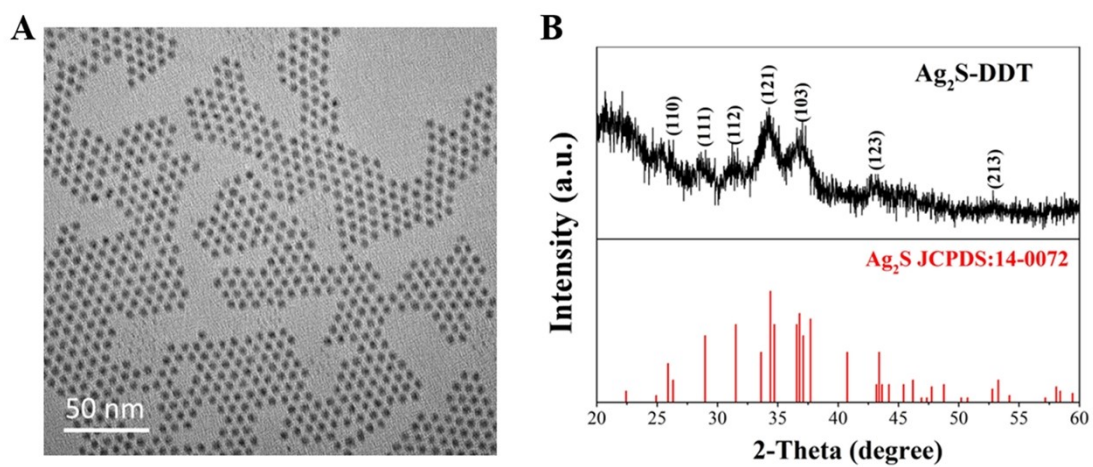


Fig. S1 (A) TEM image of Ag_2S -DDT; (B) XRD spectrum of Ag_2S -DDT.

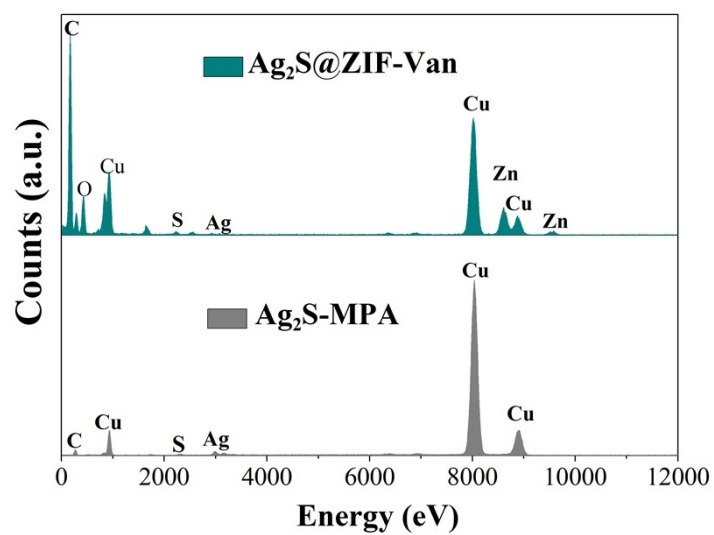


Fig. S2 The EDS spectra of Ag_2S -MPA and Ag_2S @ZIF-Van.

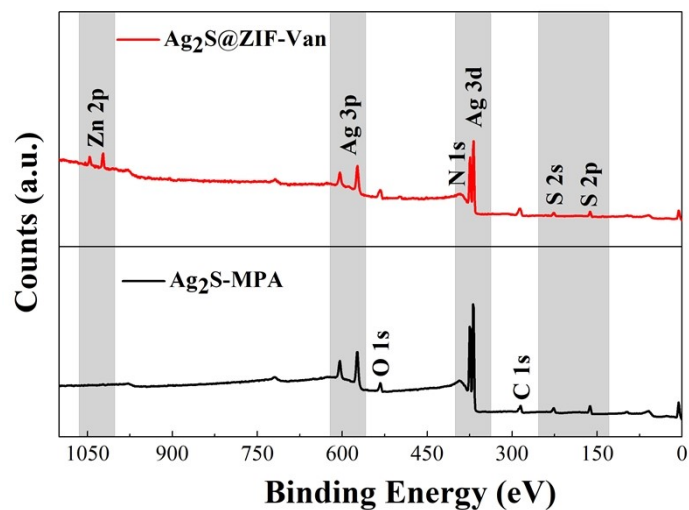


Fig. S3 The XPS spectra of Ag₂S-MPA and Ag₂S@ZIF-Van.

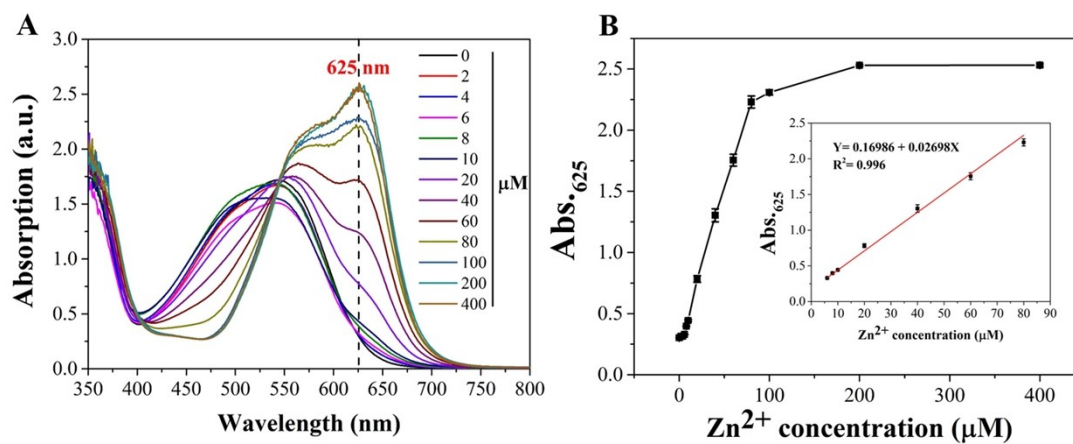


Fig. S4 (A) The absorption spectra of Zincon monosodium salt after combined with different concentration of Zn²⁺ ions; (B) The curve and fitted linear relationship (inset picture) between absorption intensity at 625 nm and the concentrations of Zn²⁺ ions.

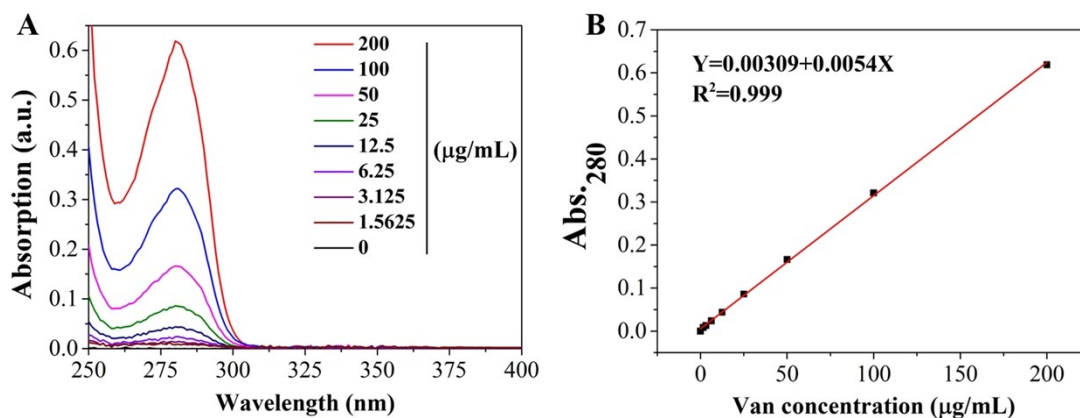


Fig. S5 (A) The absorption spectra of different concentration of Van; (B) The fitted linear relationship between absorption intensity at 280 nm and the concentrations of Van .

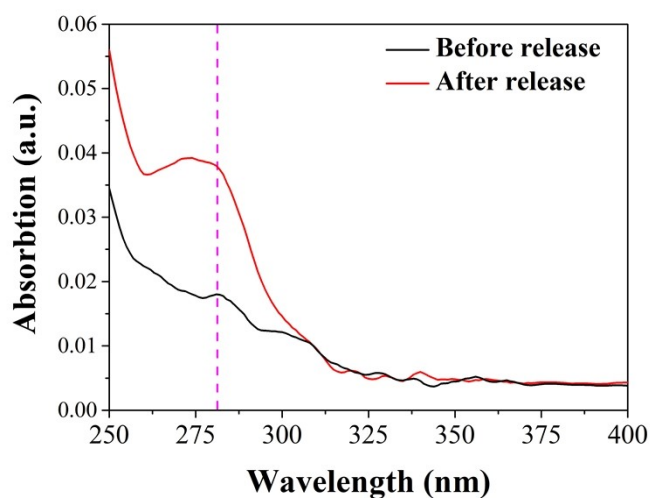


Fig. S6 The absorption spectra of the centrifugal supernatant of $\text{Ag}_2\text{S}@ZIF\text{-Van}$ in before release (black line) and after release (red line) for calculating the Van contents in $\text{Ag}_2\text{S}@ZIF\text{-Van}$ (100 $\mu\text{g/mL}$).

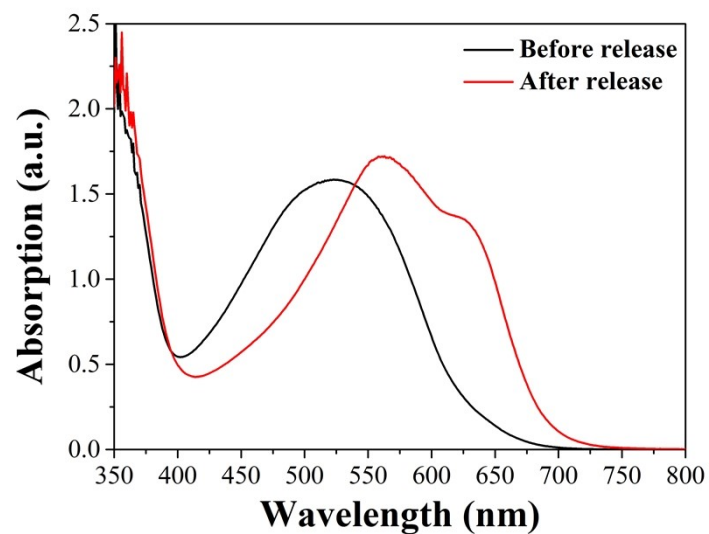


Fig. S7 The absorption spectra of the Zincon monosodium salt after reaction with centrifugal supernatant of $\text{Ag}_2\text{S@ZIF-Van}$ in before release (black line) and after release (red line) for calculating Zn^{2+} ions contents in $\text{Ag}_2\text{S@ZIF-Van}$ ($200 \mu\text{g/mL}$).

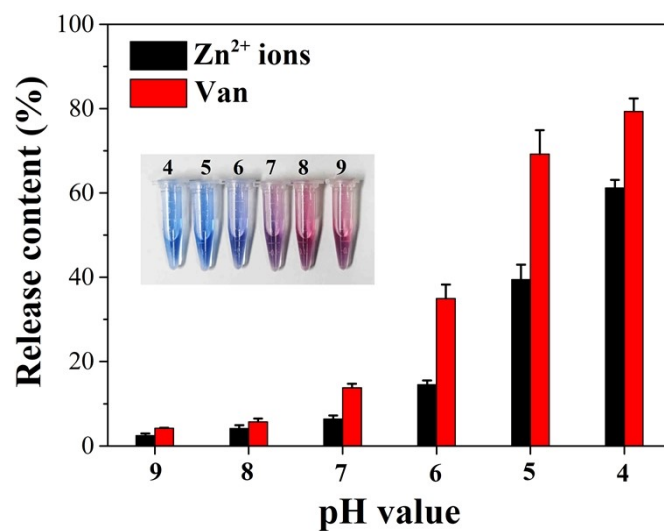


Fig. S8 The $\text{Ag}_2\text{S@ZIF-Van}$ release content of Zn^{2+} ions and Van after incubated 2 h in different pH environment and color change of Zincon monosodium salt solution (inset picture).

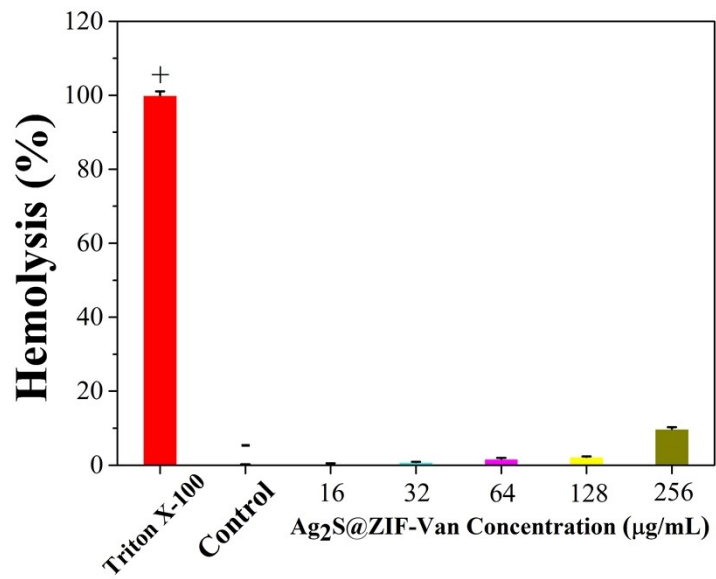


Fig. S9 Hemolysis test of Ag₂S@ZIF-Van at different concentrations.

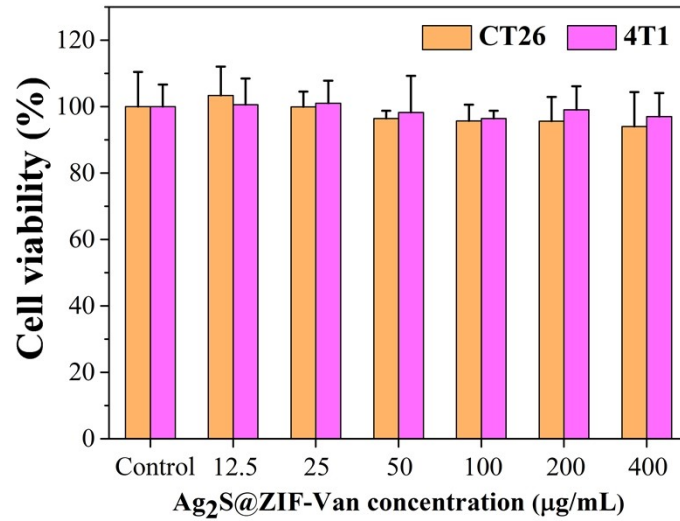


Fig. S10 Cytotoxicity of Ag₂S@ZIF-Van with different concentrations to CT26 and 4T1.

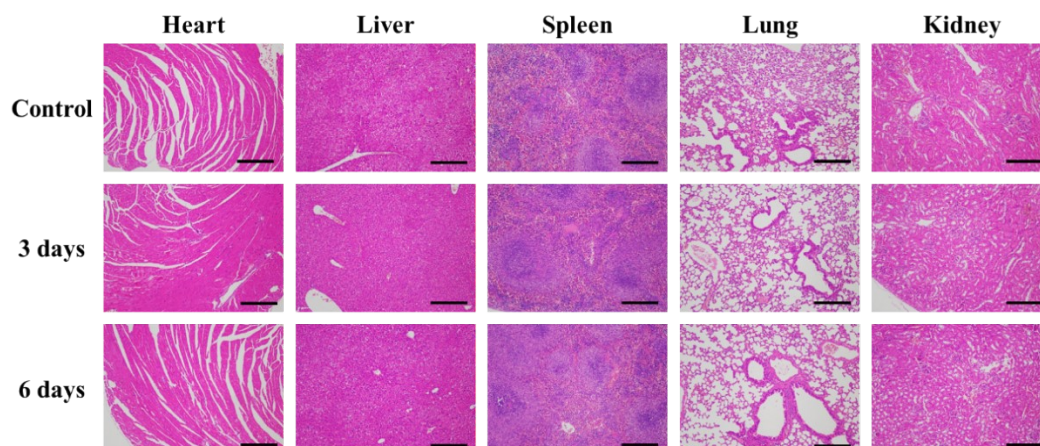


Fig. S11 *In vivo* toxicity tests of $\text{Ag}_2\text{S@ZIF-Van}$ by H&E-stained tissue sections (scale bar = 200 μm).

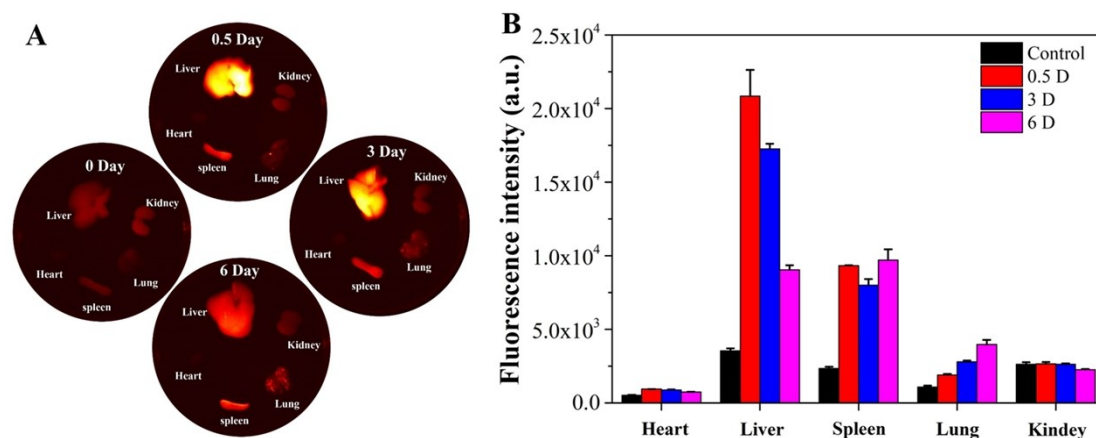


Fig. S12 (A) Ex-vivo NIR-II fluorescent imaging of main organs from the mice treated with $\text{Ag}_2\text{S@ZIF-Van}$ after 0.5 day, 3 day, 6 day post-injection under 808 nm NIR laser excitation (300 mW/cm^2) with NIR-II imaging system. (B) Fluorescence intensity of each organ corresponding to (A) as a function of time.

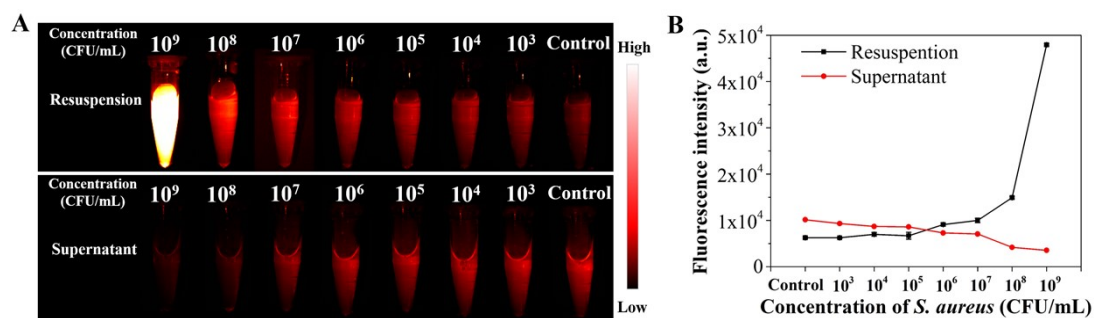


Fig. S13 (A) NIR-II fluorescent imaging of resuspension and supernatant after incubation and then centrifugation of different concentrations of *S. aureus* with $\text{Ag}_2\text{S}@ZIF\text{-Van}$; (B) The curve of optical signal intensity corresponding to (A).

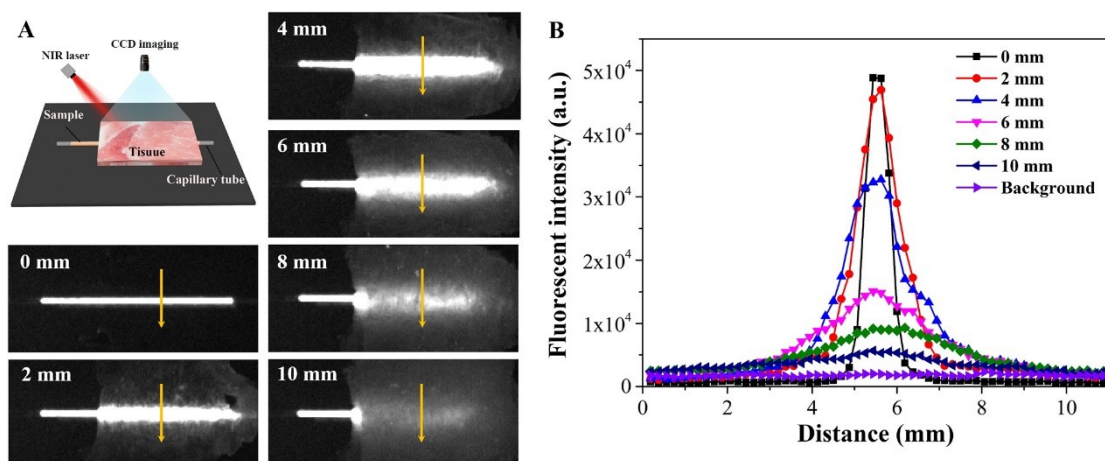


Fig. S14 (A) The schematic diagram of tissue depth imaging experiment and NIR-II fluorescent images of $\text{Ag}_2\text{S}@ZIF\text{-Van}$ at different tissue depths. (B) The fluorescence signal distribution at the yellow arrow position of different tissue depth imaging in (A).

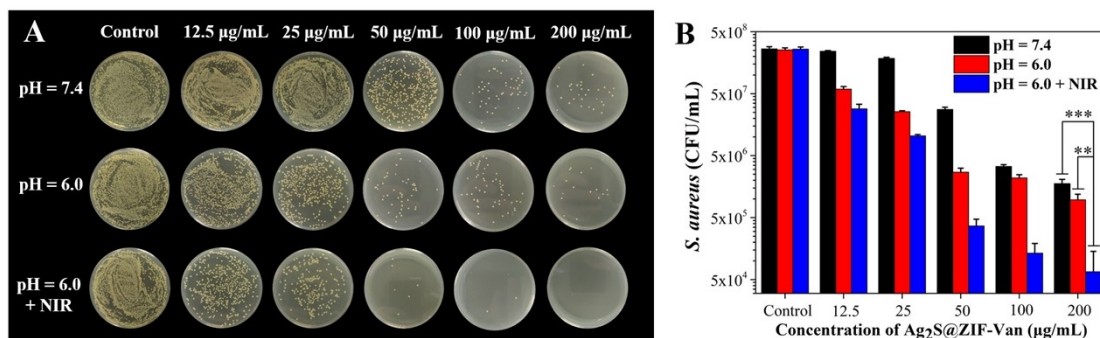


Fig. S15 (A) Plate coating count of *S. aureus* after treatment with different concentration of Ag₂S@ZIF-Van in various environment (pH = 7.4, pH = 6.0 or pH = 6.0 + NIR irradiation); (B) *S. aureus* count histogram corresponding to (A).

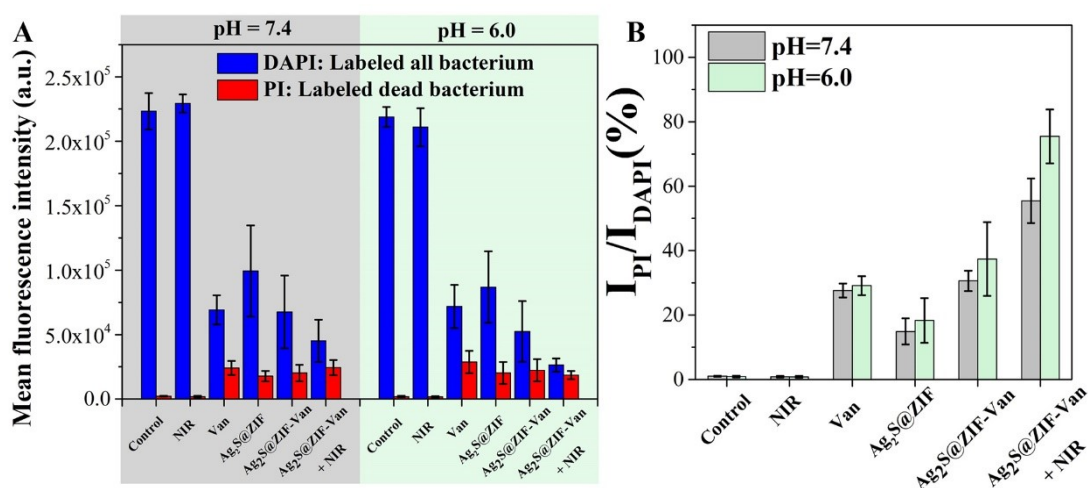


Fig. S16 (A) The fluorescence analysis of confocal imaging of Fig. 4D; (B) The ratio of I_{PI} to I_{DAPI} fluorescence.

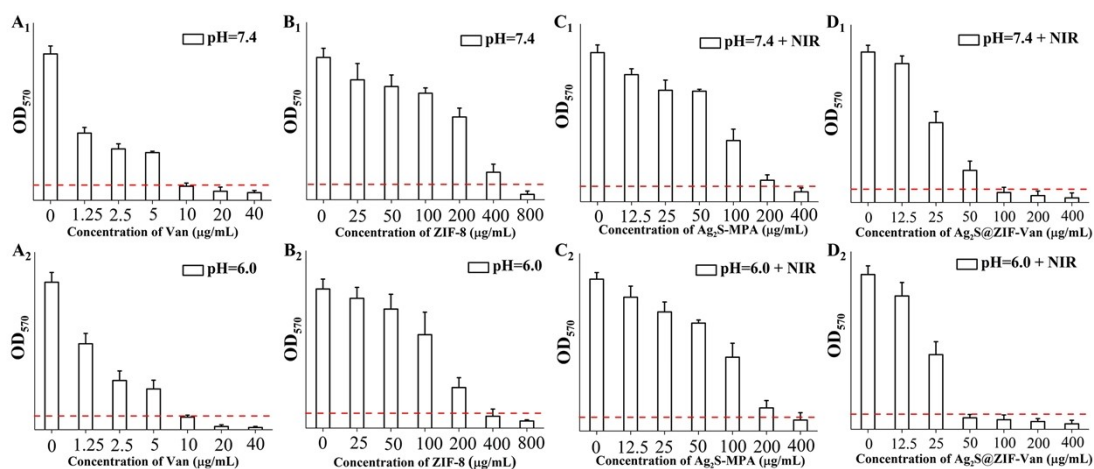


Fig. S17 The OD₅₇₀ of wells after treatment with each anti-bacterial methods. The red line represents 90% bacteriostatic rate. (A₁) and (A₂): Van; (B₁) and (B₂): ZIF-8; (C₁) and (C₂): Ag₂S-MPA + NIR irradiation; (D₁) and (D₂): Ag₂S@ZIF-Van + NIR irradiation.

Table S1 MIC_(6h) of each anti-bacterial methods.

Sample name	pH	MIC _(6h)
Van	7.4	10 μg/mL
	6.0	10 μg/mL
ZIF-8	7.4	>400 μg/mL
	6.0	400 μg/mL
Ag ₂ S-MPA + NIR	7.4	400 μg/mL
	6.0	400 μg/mL
Ag ₂ S@ZIF-Van + NIR	7.4	100 μg/mL
	6.0	50 μg/mL

Per 100 μg of Ag₂S@ZIF-Van contains ~2 μg of Van, ~30 μg of Ag₂S-MPA, ~68 μg of ZIF-8.

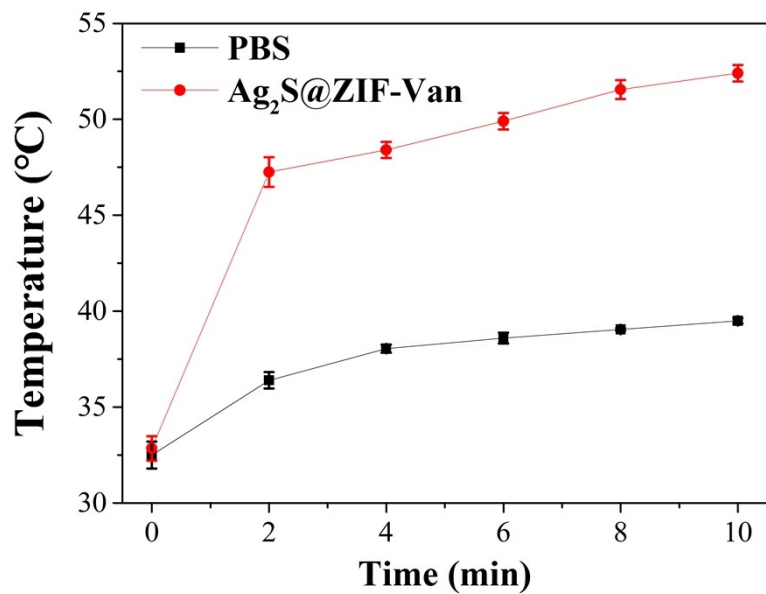


Fig. S18 Temperature change curves of bacterial wound infection site after treatment with PBS solution and Ag₂S@ZIF-Van under 808 nm laser (1.0 W/cm²) irradiation, respectively.

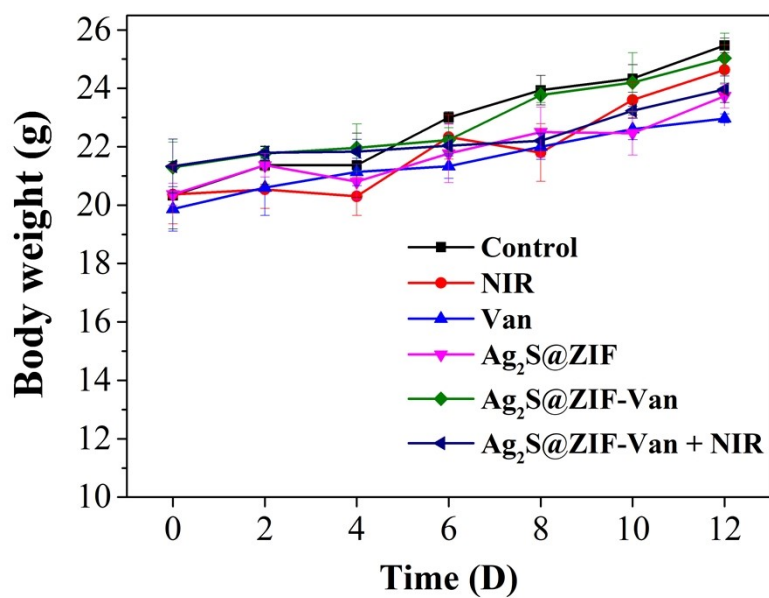


Fig. S19 Body weight change of mice after different treatments.

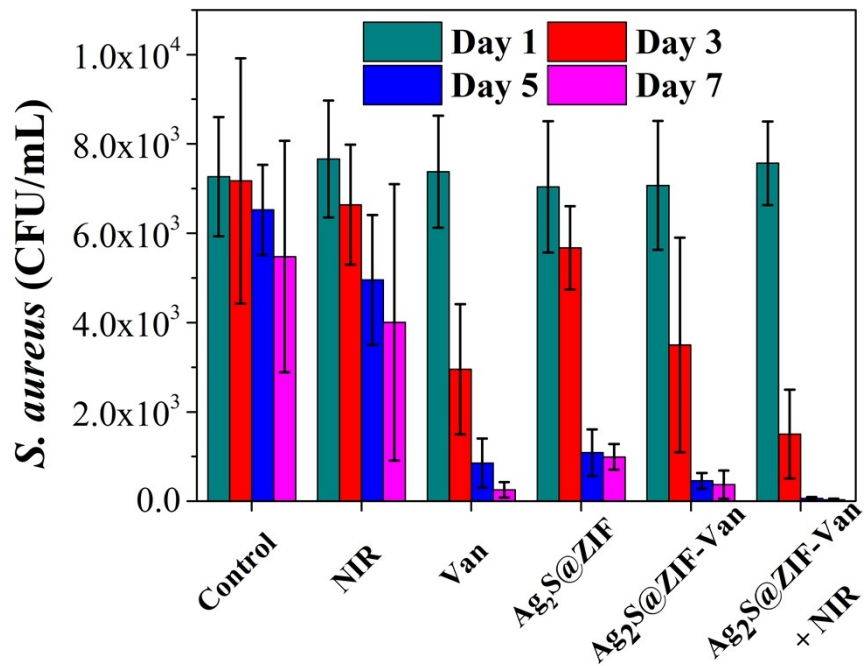


Fig. S20 The corresponding CFU counts of *S. aureus* colonies from each wounds, (n=3).