

**A Multifunctional Nanozyme Hydrogel with  
Antibacterial, Antioxidative, and Photo-Induced Nitric  
Oxide-Supplying Properties for Promoting Infected  
Wound Healing**

### Equations for photothermal conversion efficiency ( $\eta$ )

Obtained time constant ( $\tau_s$ ) for heat transfer of the photothermal agents by applying linear time data versus  $\ln \theta$  from the cooling stage.  $\theta$  can be calculated according to the equation (S1):

$$\theta = \frac{T - T_{\text{surr}}}{T_{\text{max}} - T_{\text{surr}}} \quad \text{Equation (S1)}$$

The photothermal conversion efficiency ( $\eta$ ) of the NPs can be calculated according to the equation (S2):

$$\eta = \frac{hS(T_{\text{max}} - T_{\text{surr}}) - Q_{\text{dis}}}{I(1 - 10^{-A_{808}})} \times 100\% \quad \text{Equation (S2)}$$

The maximum steady temperature ( $T_{\text{Max}}$ ) and environmental temperature ( $T_{\text{Surr}}$ ) were 59.4 °C and 23.1 °C, respectively.  $h$  is the heat transfer coefficient,  $S$  is the surface area of the container, and the value of  $hS$  can be calculated by  $MC/\tau_s$ . Where  $M$  is the mass of water (1 g),  $C$  is the specific heat capacity of water (4.2 J/g °C), and  $\tau_s$  is the time constant (292.35 s). The  $Q_{\text{dis}}$  represents the heat dissipated from the light absorbed by the container, and it is calculated to be approximately equal to 0.02 W. The incident laser power ( $I$ ) and the absorbance of the NPs dispersion at 808 nm ( $A_{808}$ ) were 1 W and 1.925, respectively.

### Formula for cumulative release

$$W\% = \frac{C_{ti} \times V + \sum C_{ti} \times V_{ti}}{M} \times 100\%$$

$W\%$ : Cumulative release amount of the drug,  $M$ : Initial drug loading,  $C_{ti}$ : Concentration of the drug in the extracted sample at time  $t_i$ ,  $V$ : Volume of *release* medium,  $V_{ti}$ : Volume of extracted sample.

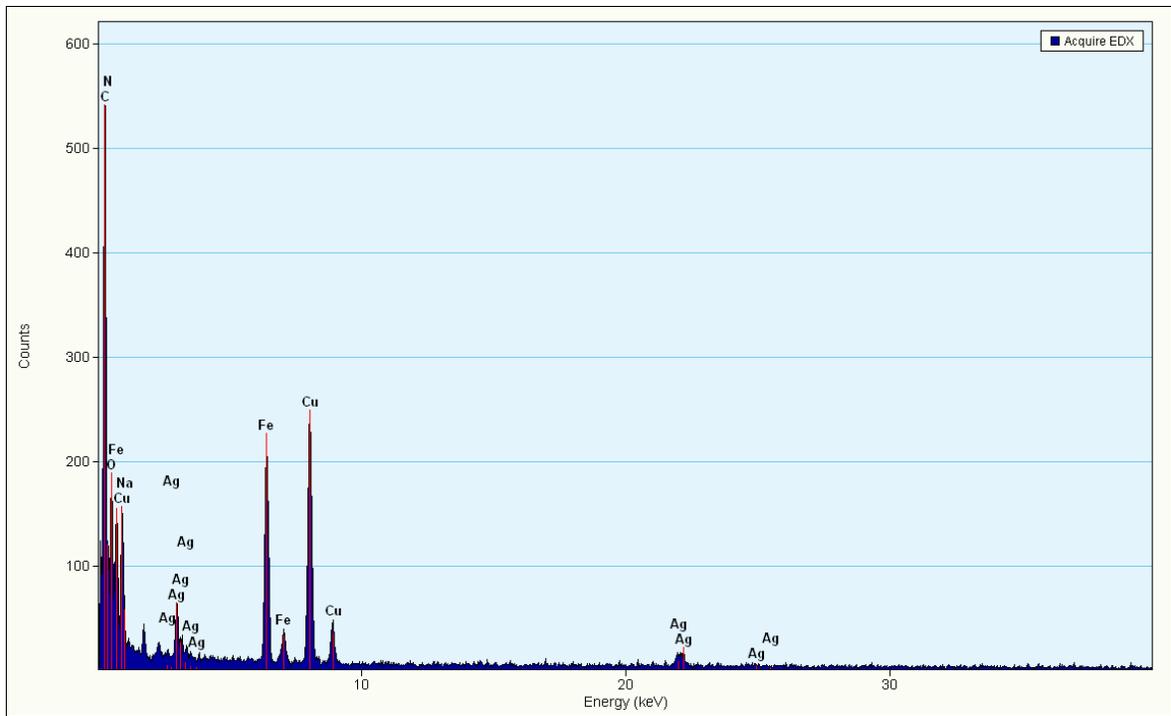


Figure S1. Energy dispersive X-ray analysis of the nanozyme.

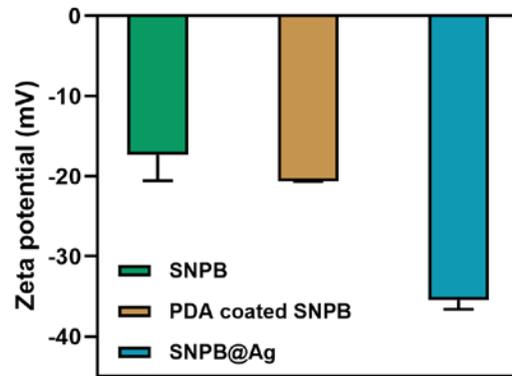
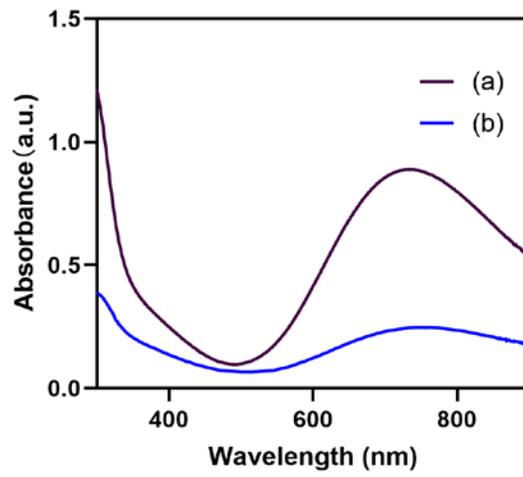
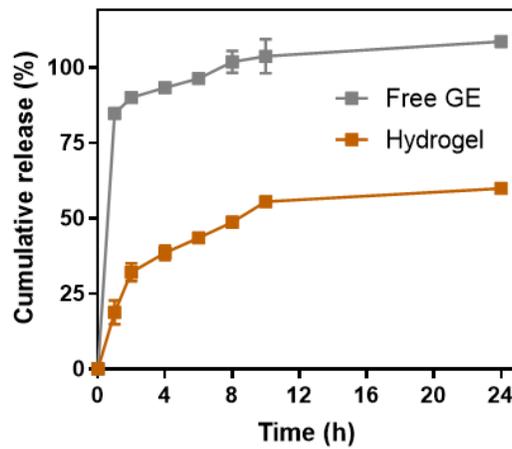


Figure S2. The zeta potential of different samples ( $n=3$ ).



**Figure S3.** The UV-visible spectrum of (a) SNPB NPs and (b) SNPB@Ag NPs.



**Figure S4.** *In vitro* drug release profiles of GE from the GE/SNPB@Ag hydrogel in PBS at pH 5.0 ( $n = 3$ ).

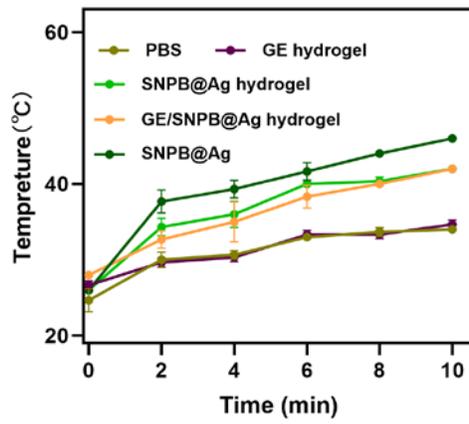


Figure S5. Temperature changes at the wound areas of mice ( $n = 3$ ).

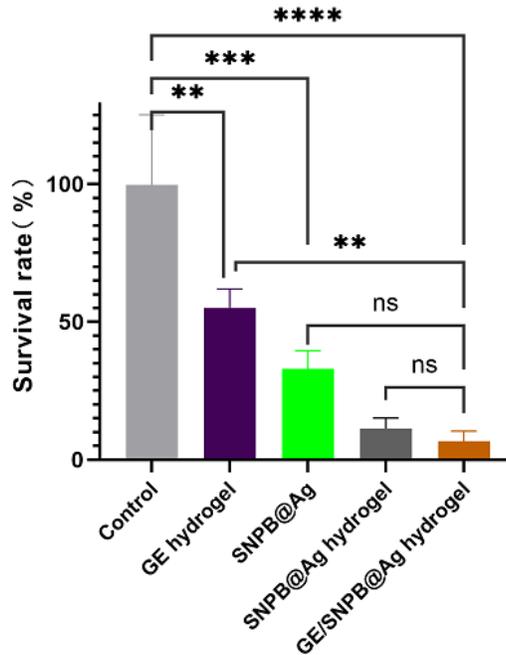


Figure S6. Relative bacterial survival of MRSA treated with PBS, GE hydrogel, SNPB@Ag solution, SNPB@Ag hydrogel (with NIR laser), and GE/SNPB@Ag hydrogel (with NIR laser) ( $n = 3$ ).