

## Electronic Supplementary Information

# Oxygen Self-supplying Small Size Magnetic Nanoenzymes for Synergistic Photodynamic and Catalytic Therapy of Breast Cancer

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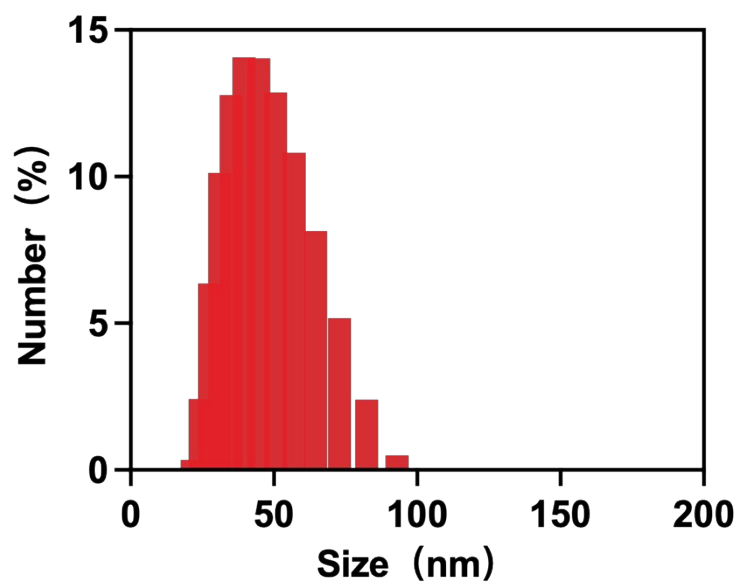
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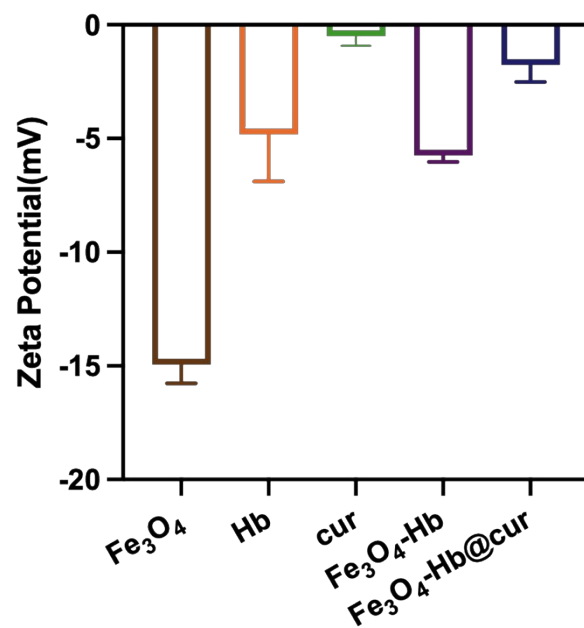
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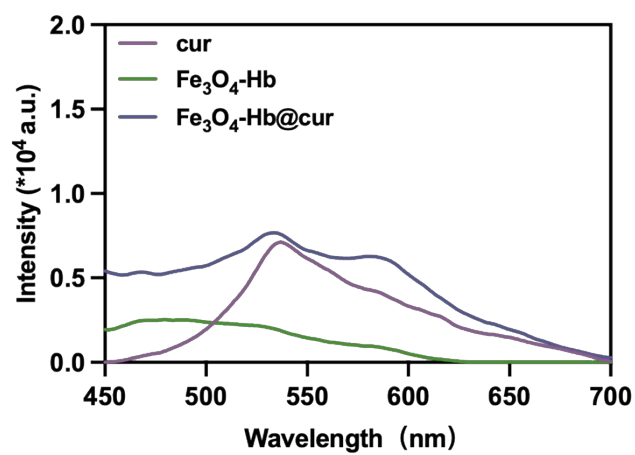
† These authors contributed equally to this work.



**Figure S1.** Size distribution of the Fe<sub>3</sub>O<sub>4</sub>-Hb@cur.



**Figure S2.** Zeta potential changes of different samples. Data are presented as mean  $\pm$  SD (n = 3).



**Figure S3.** Fluorescence spectra of cur, Fe<sub>3</sub>O<sub>4</sub>-Hb@cur, and Fe<sub>3</sub>O<sub>4</sub>-Hb.

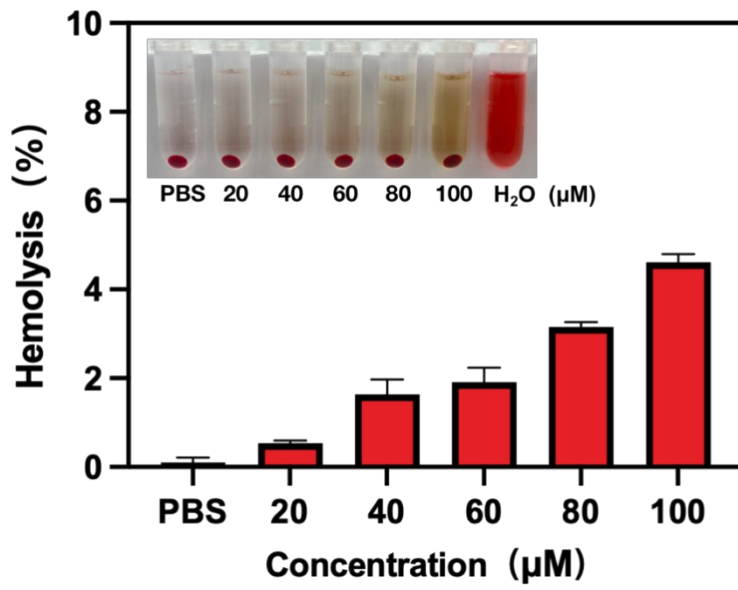
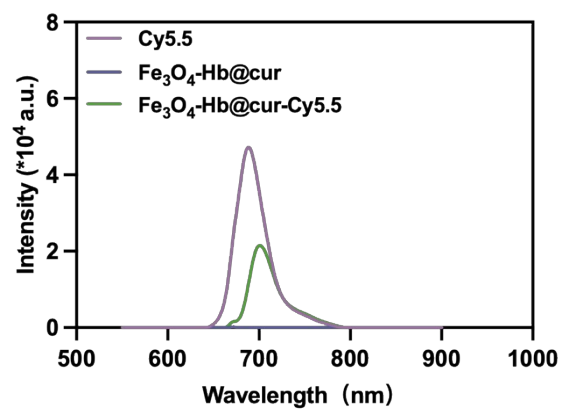
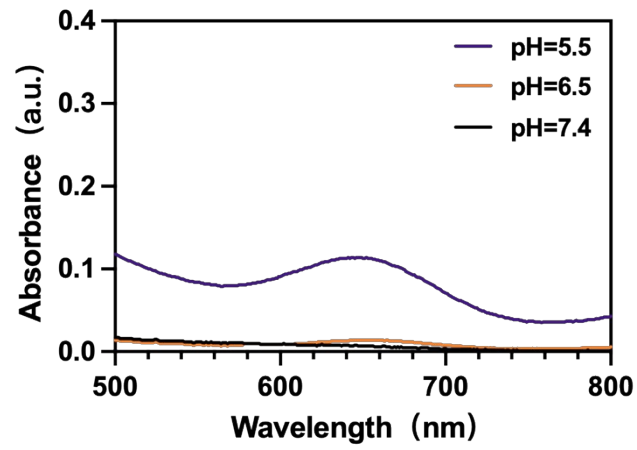


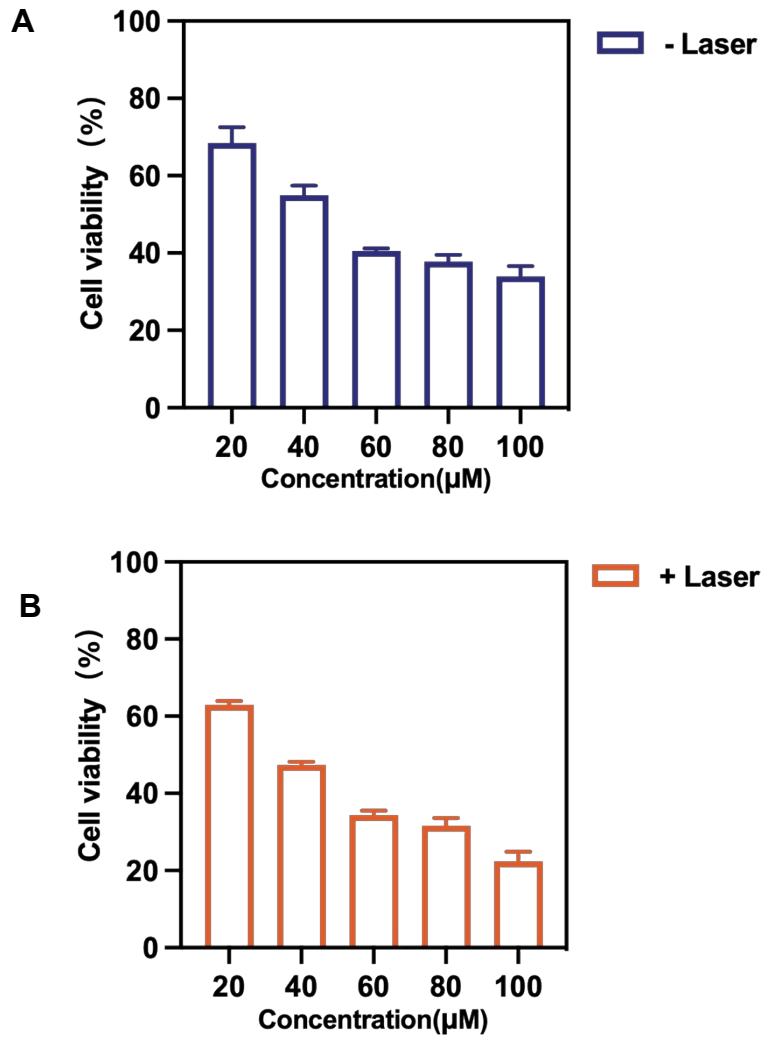
Figure S4. Hemolysis rates of Fe<sub>3</sub>O<sub>4</sub>-Hb@cur at different concentrations (0-100 μM).



**Figure S5.** Fluorescence spectra of Cy5.5 、 Fe<sub>3</sub>O<sub>4</sub>-Hb@cur-Cy5.5 、 Fe<sub>3</sub>O<sub>4</sub>-Hb@cur.

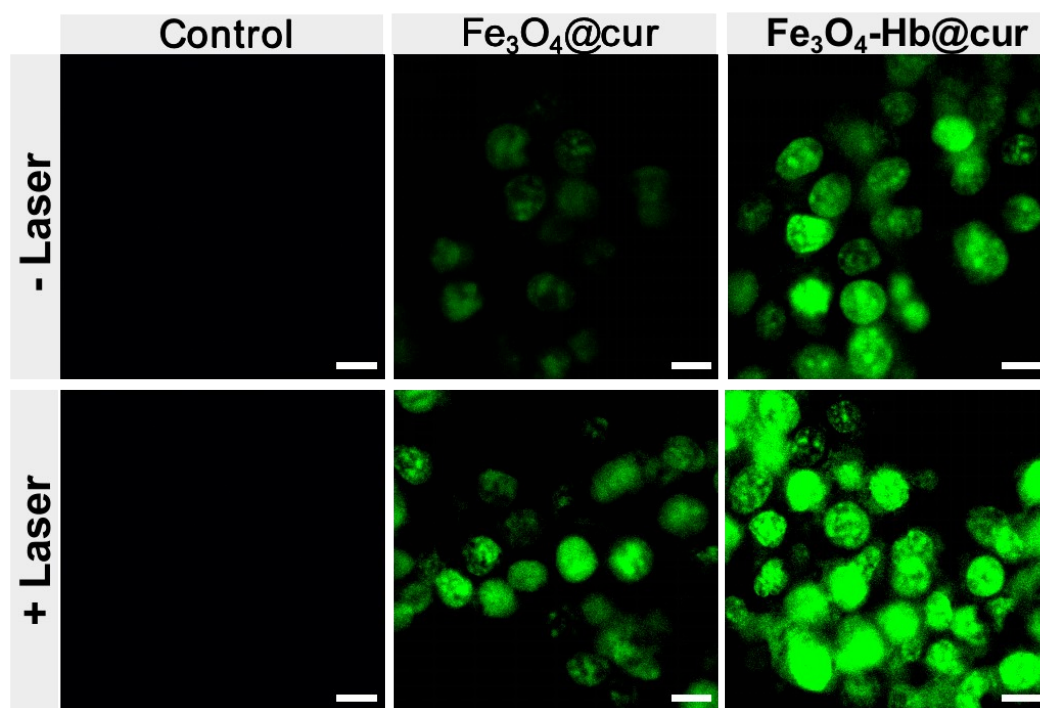


**Figure S6.** UV-Vis absorption spectra of Fe<sub>3</sub>O<sub>4</sub>-Hb@cur and TMB at different pH values.



**Figure S7.** Cytotoxicity of different concentrations of  $\text{Fe}_3\text{O}_4\text{-Hb@cur}$ , against 4T1 cells in the dark (A) and after 30 seconds of laser irradiation (B).





**Figure S8.** Detection of ROS levels after different treatments in DCFH-DA-stained 4T1 cells for 12 h. Scale bar: 10 nm.

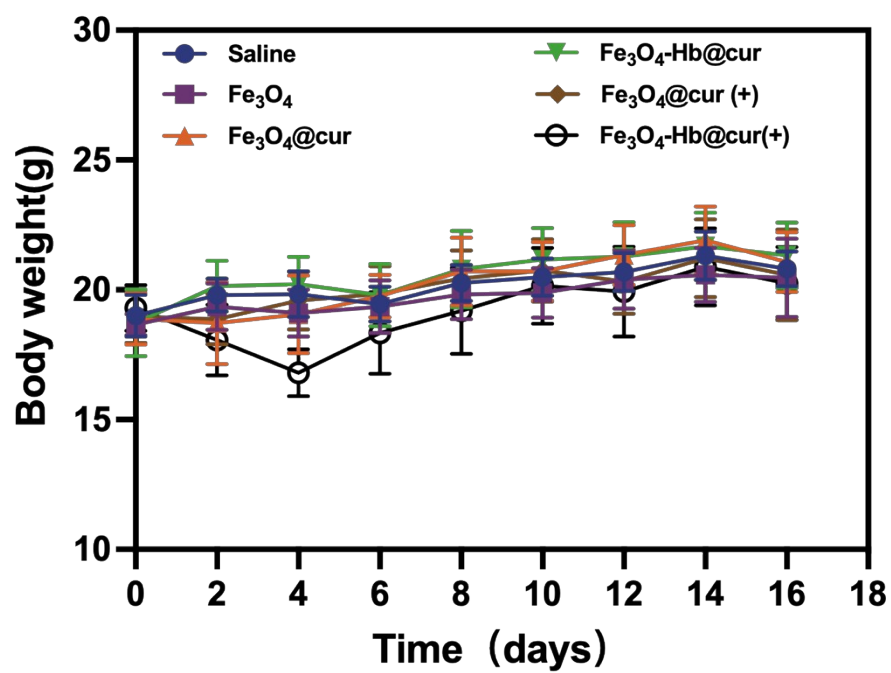


Figure S9. Body weight changes of the mice treated with different samples.