Supporting Information

Peroxidase-like Fe₃O₄ Nanocomposite for Activatable Reactive Oxygen Species Generation and Cancer Theranostics

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Scheme S 1. Synthesis of Porphyrin.
Fig. S 1. Mass Spectrometry of porphyrin.
Fig. S2. \( \text{N}_2 \) adsorption-desorption isotherms (inset: the pore diameter distribution) of Fe\(_2\)O\(_4\)@CS/CuS NPs
Fig. S3. a) Photothermal heating curves of different weight ratio of Fe$_3$O$_4$ @CS and CuS solutions under 980 nm NIR-laser irradiation for 10 min, b). Loading efficiency of different weight ratio of porphyrin and Fe$_3$O$_4$ @CS/CuS.
Fig. S4. (a) DLS of FCCP before and after mixing with serum. (b) Dispersity of FCCP at different buffer media (serum, PBS, DMEM)
Fig. S5. (a) UV-vis absorption spectra of porphyrin at different concentrations. (b) Linear fit of porphyrin absorbance at 410 nm
Fig. S6. Released profiles of porphyrin from FCCP with or without 980 nm NIR-laser irradiation at PBS buffer PH 5.0, 7.4 in PBS buffer.
**Fig. S7.** (a) The photothermal response of the Fe₃O₄@CS-CuS/porphyrin solution aqueous solution (100 μgmL⁻¹) under the irradiation of an NIR laser (980 nm, 2.1 W cm⁻²) for 600 s and then the laser was shut off. (b) Plot of the cooling time versus – \ln(θ) obtained from the cooling stage as shown in
The singlet oxygen quantum yield was calculated by the following equation S1 with respect to the reference:

$$\Phi_{S}^{\Delta} = \Phi_{R}^{\Delta} \frac{F^{R}_{k} S}{F^{S}_{k} R}$$

where S and R represent the sample and Ce6, In addition k is the slope of a plot of the difference in change in absorbance of DPBF with the irradiation time, and F is the absorption correction factor, which is calculated by $F = 1 - 10^{-\text{OD}}$(OD at the irradiation wavelength)

![Graph](image)

**Fig. S8.** In vitro cytotoxicity with different FCCP concentration of nanomaterials (10-200 μg/mL) in DMEM.
Fig. S9. Biodistribution of Fe in various organs and tissues at cancer tumor-bearing mice.

Error bars were based on the standard error of the mean of triplicate samples.