

## Supplementary information

### Renal-clearable porous hollow copper iron oxide nanoparticles for trimodal chemodynamic-photothermal-chemo anti-tumor therapy

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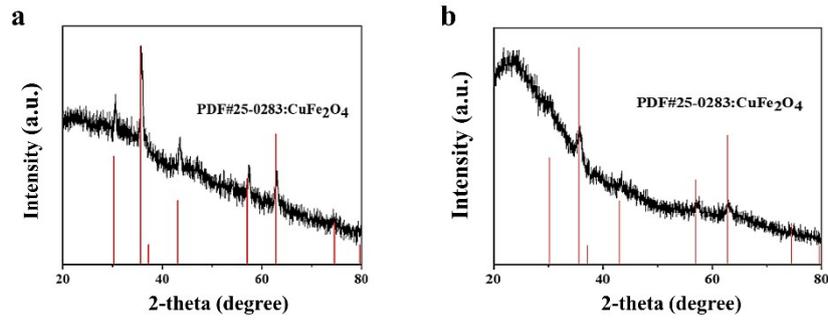
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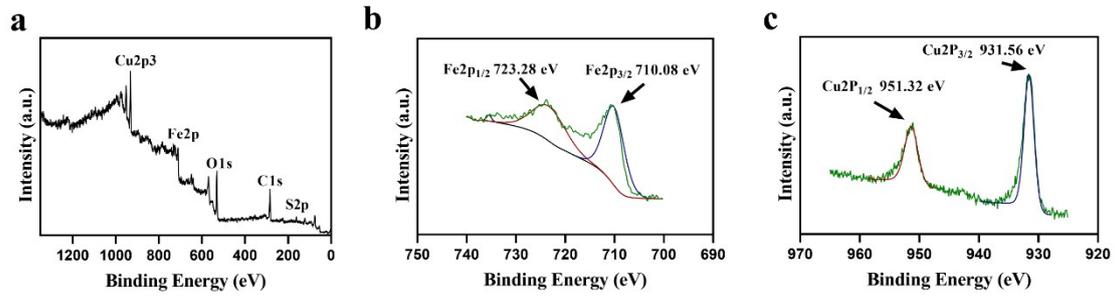
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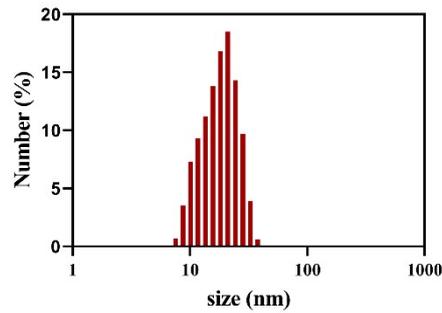
‡ These two authors contributed equally to this research.



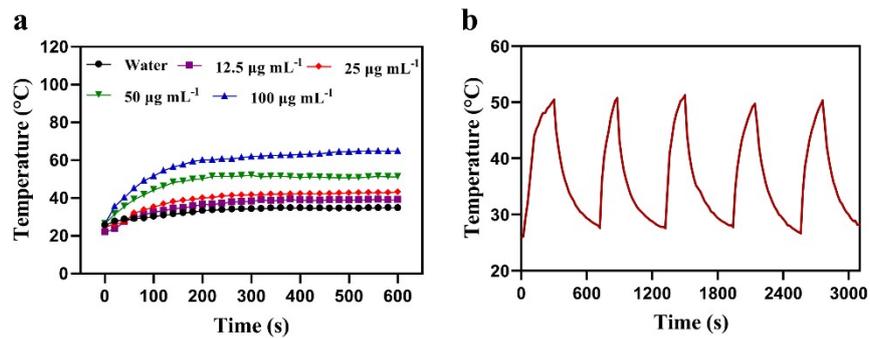
**Figure. S1** The XRD of HCuFeNPs (a) and PHCuFeNPs (b).



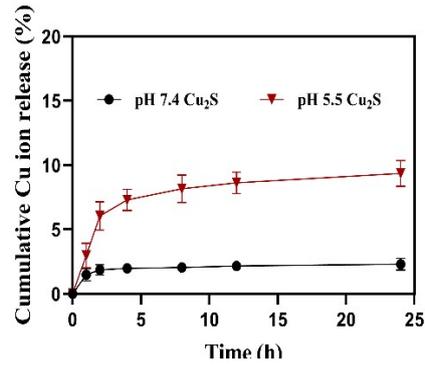
**Figure. S2** (a) The XPS of PHCuFeNPs. The Fe2p (b) and Cu2p (c) energy spectrum of PHCuFeNPs.



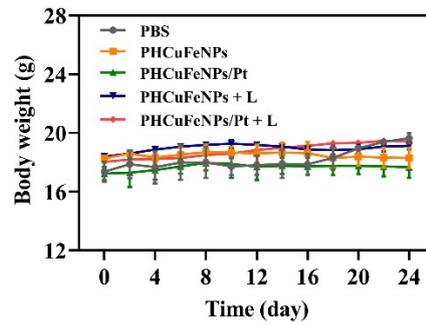
**Figure. S3** The hydrodynamic size of PHCuFeNPs.



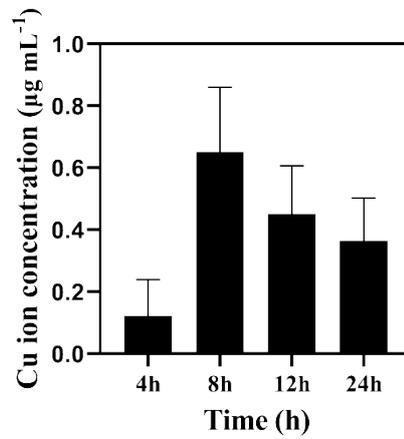
**Figure. S4** (a) The temperature curves of  $\text{Cu}_2\text{S}$  at different concentrations ( $12.5$ ,  $25$ ,  $50$  and  $100 \mu\text{g mL}^{-1}$ ) upon laser irradiation ( $980 \text{ nm}$ ,  $1.5 \text{ W cm}^{-2}$ ) for  $10 \text{ min}$ . (b) The temperature curve of PHCuFeNPs ( $25 \mu\text{g mL}^{-1}$ ) for five heat-cool cycles upon laser irradiation ( $980 \text{ nm}$ ,  $1.5 \text{ W cm}^{-2}$ ).



**Figure. S5** The Cu ions release of Cu<sub>2</sub>S NPs at different pHs.



**Figure. S6** The mice body weights after different treatments.



**Figure. S7** Cu ions concentrations in urine after treatment with PHCuFeNPs.