

Electronic supporting Information for:

**Mesoporous carbon hemispheres integrated with Fe-Gd nanoparticles for  
potential MR/PA imaging-guided photothermal therapy**

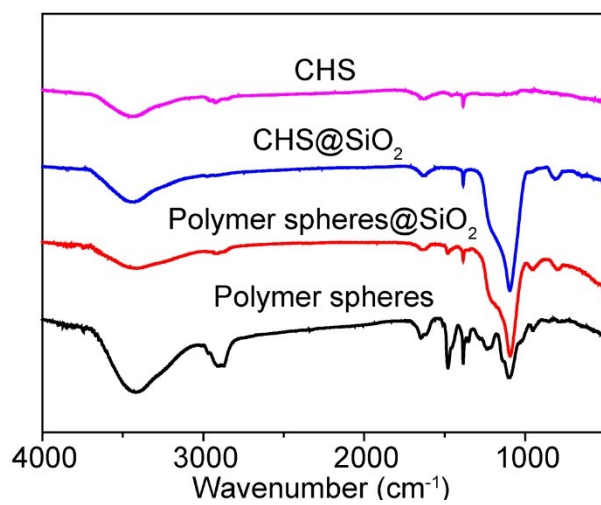
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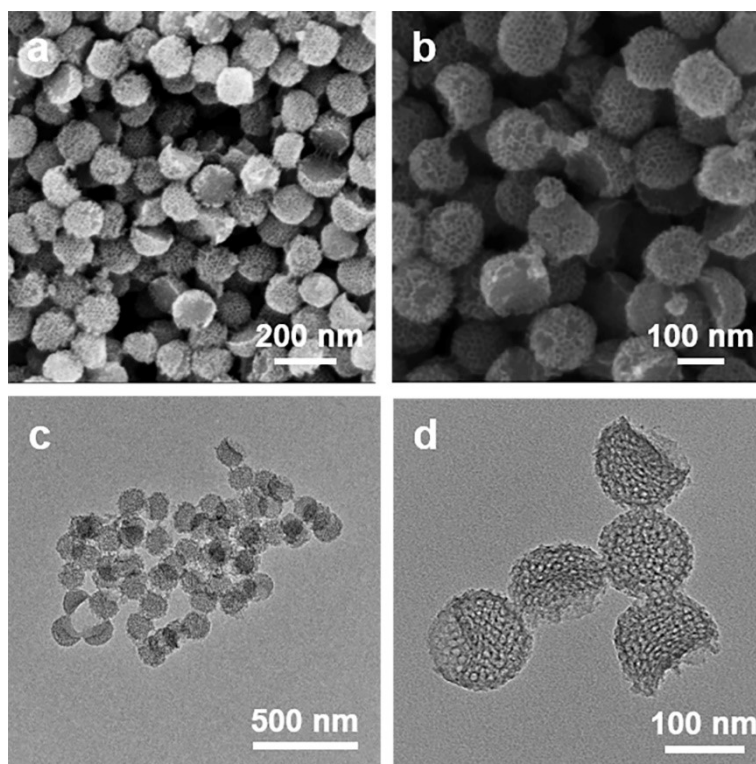
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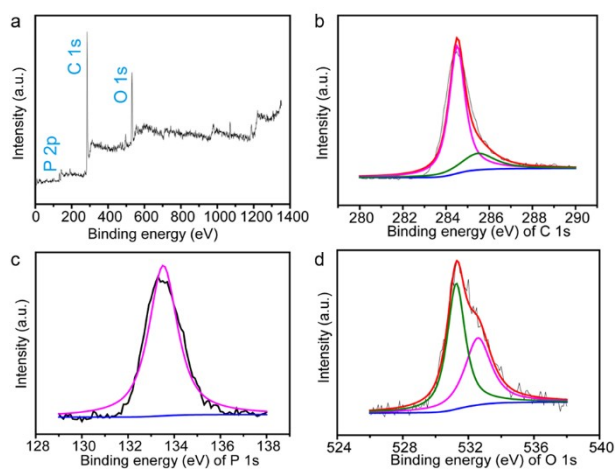
**Figure S1.** FT-IR spectra of CHS, CHS@SiO<sub>2</sub>, Polymer spheres@SiO<sub>2</sub>, and Polymer spheres.



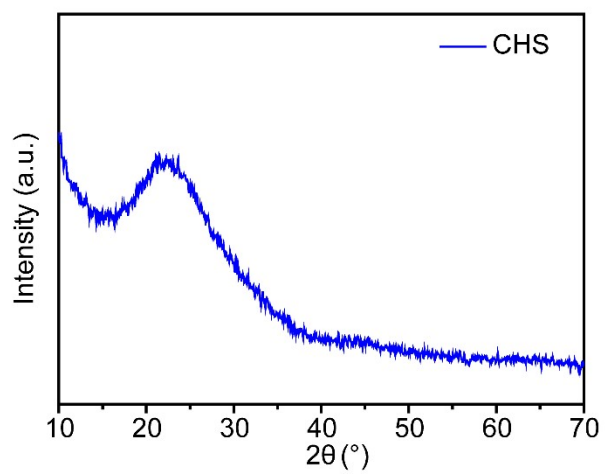
**Figure S2.** (a, b) SEM images, (c, d) TEM images of Fe-Gd/CHS nanoparticles from various directions.



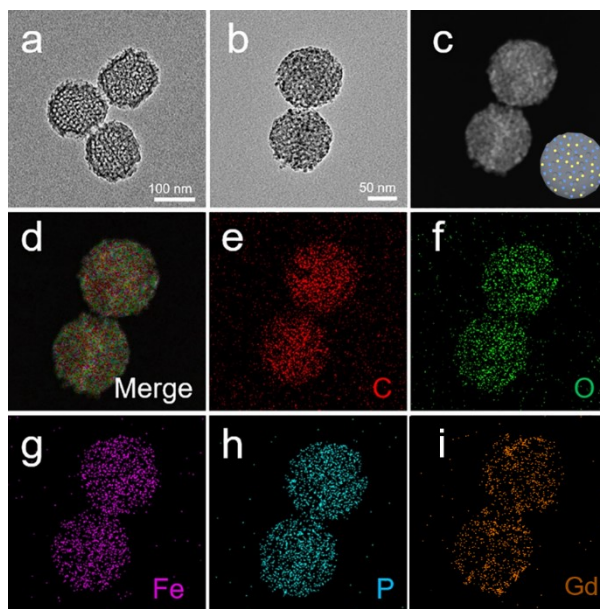
**Figure S3.** (a) XPS spectra, (b) C 1s, (c) P 1s, (d) O 1s levels of Fe-Gd/CHS nanoparticles.



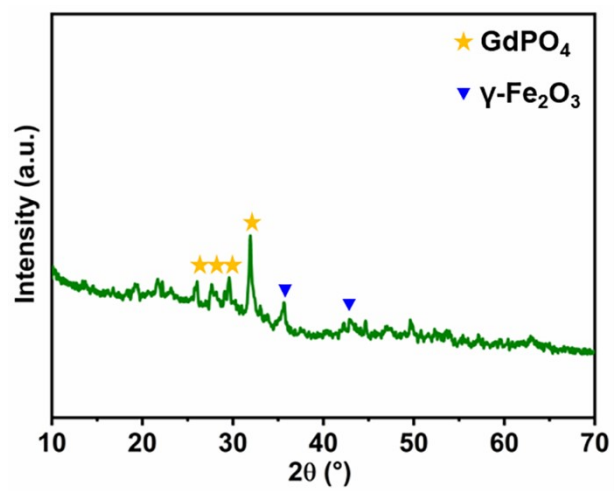
**Figure S4.** PXRD pattern of CHS.



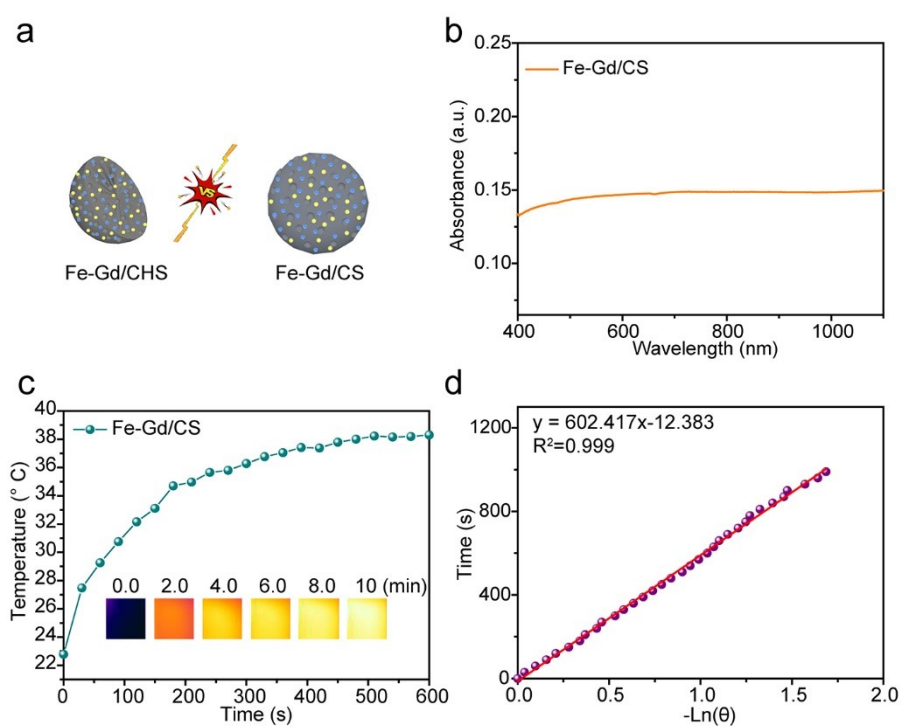
**Figure S5.** TEM images of (a) CS and (b) Fe-Gd/CS, (c) HAADF-STEM images of Fe-Gd/CS, (d) Overlay elemental image and (e-i) the corresponding EDS maps of C, O, Fe, P, and Gd elements.



**Figure S6.** (a) PXRD pattern of Fe-Gd/CS.

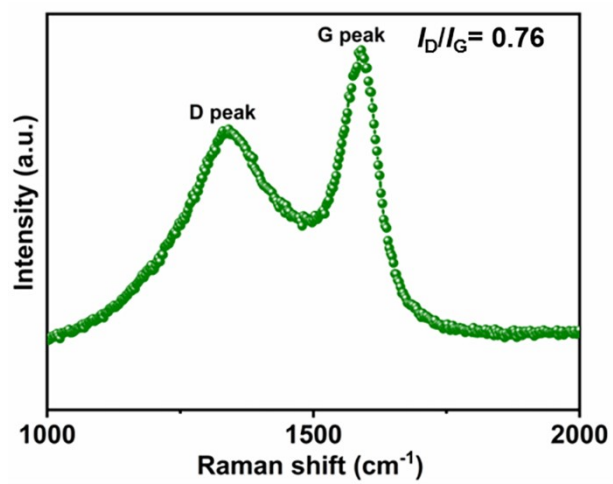


**Figure S7.** (a) Schematic illustration of photothermal property of Fe-Gd/CHS and Fe-Gd/CS nanoparticles; (b) UV-Vis-NIR absorbance spectra of Fe-Gd/CS powders; (c) Photothermal activity of Fe-Gd/CS with a concentration of  $500 \mu\text{g}\cdot\text{mL}^{-1}$  (insert: the corresponding IR thermal images); (d) Linear time data versus  $-\ln(\theta)$  obtained from the cooling period of Fe-Gd/CS aqueous solution.

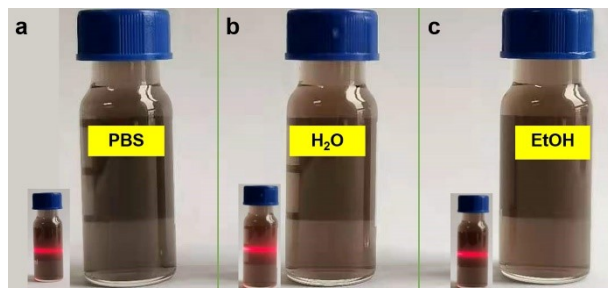




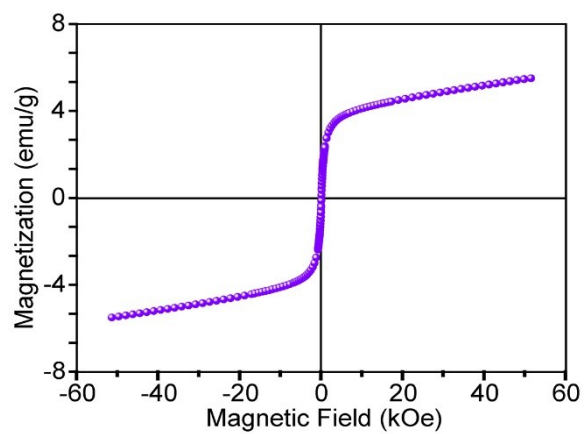
**Figure S8.** Raman spectra of Fe-Gd/CS.



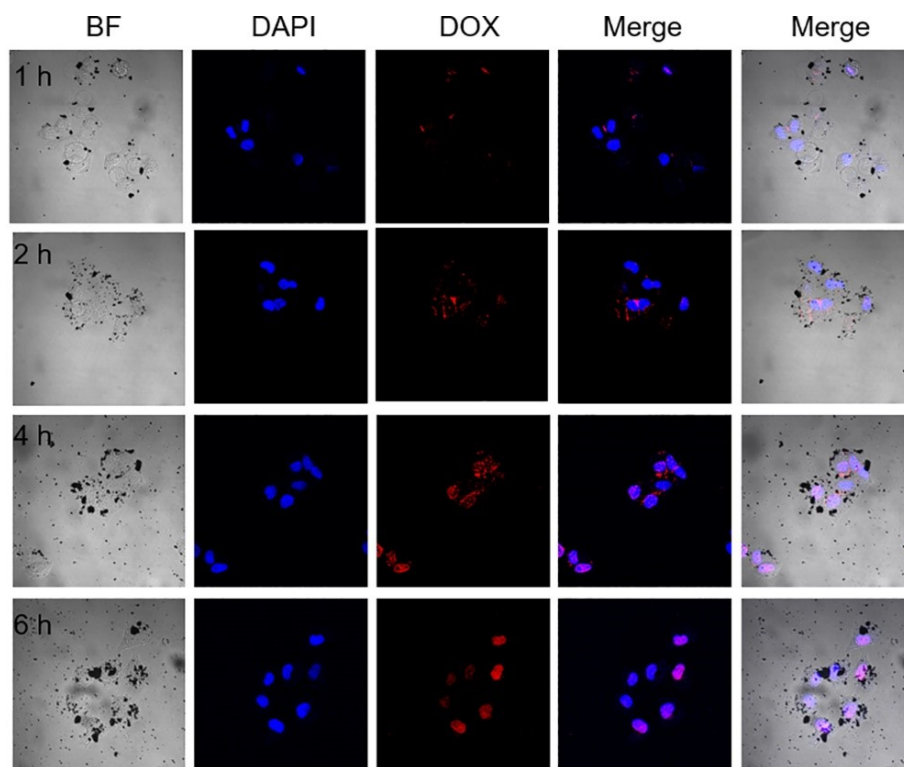
**Figure S9.** The photographic images of Fe-Gd/CHS dispersed in the (a) PBS, (b) H<sub>2</sub>O, and (c) EtOH solution.



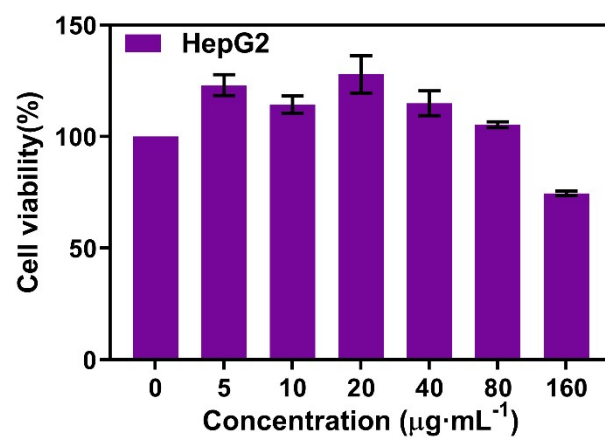
**Figure S10.** Magnetic hysteresis loop of Fe-Gd/CHS.



**Figure S11.** CLSM images of HeLa cells incubated with DOX@Fe-Gd/CHS for 1, 2, 4, and 6 h (Blue and red fluorescence represents the DAPI and DOX in cells, respectively).



**Figure S12.** Viability of HepG2 cells after incubation with Fe-Gd/CHS at different concentrations.



**Figure S13.** CLSM images of HeLa cells incubated with Fe-Gd/CHS after various treatments (green and red fluorescence represents the AM and PI in cells, respectively).

