

Electronic Supplementary Information

MnO₂ Coated Nanotheranostic LDH for Synergistic Cascade Chemo/Chemodynamic Cancer Therapy under the Guidance of MRI-Targeted Diagnosis

Bengao Zhu,^a Xuefei Lv,^b Mengmeng Zhang,^a Huiying Wang,^a Senbin Chen,^{*a} Jintao Zhu^{*a}

* Corresponding authors

^a: State Key Laboratory of Materials Processing and Mold Technology, and Key Laboratory of Materials Chemistry for Energy Conversion and Storage of Ministry of Education (HUST), School of Chemistry and Chemical Engineering, Huazhong University of Science and Technology (HUST), Wuhan 430074, Hubei, PR China

Email: jtzhu@mail.hust.edu.cn (J. Z.), senbin@hust.edu.cn (S. C.)

^b: Radiology department, Wuhan Red Cross Hospital, Wuhan 430074, Hubei, PR China

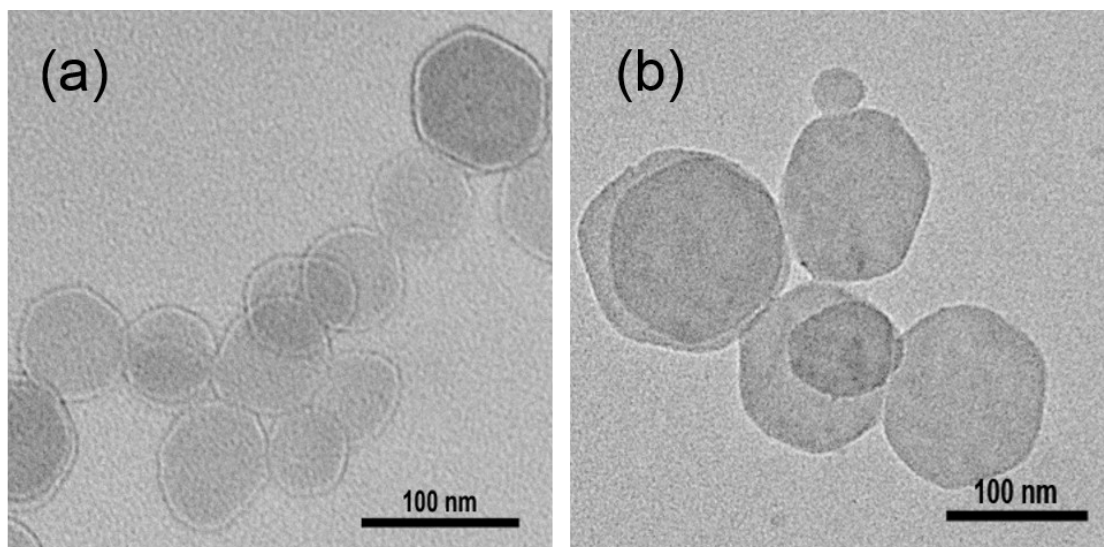


Figure S1. TEM images of LDH (a), LDH/5-FU (b).

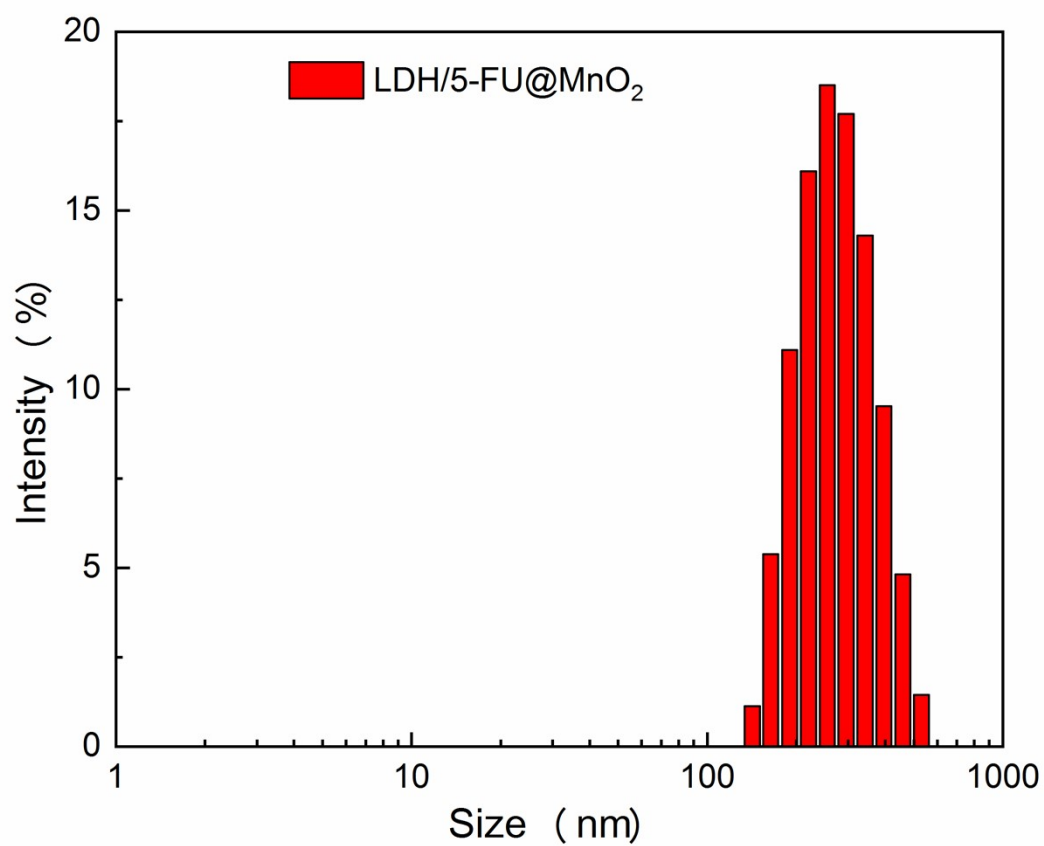


Figure S2. DLS histograms of LDH/5-FU@MnO₂, c = 250 µg/mL.

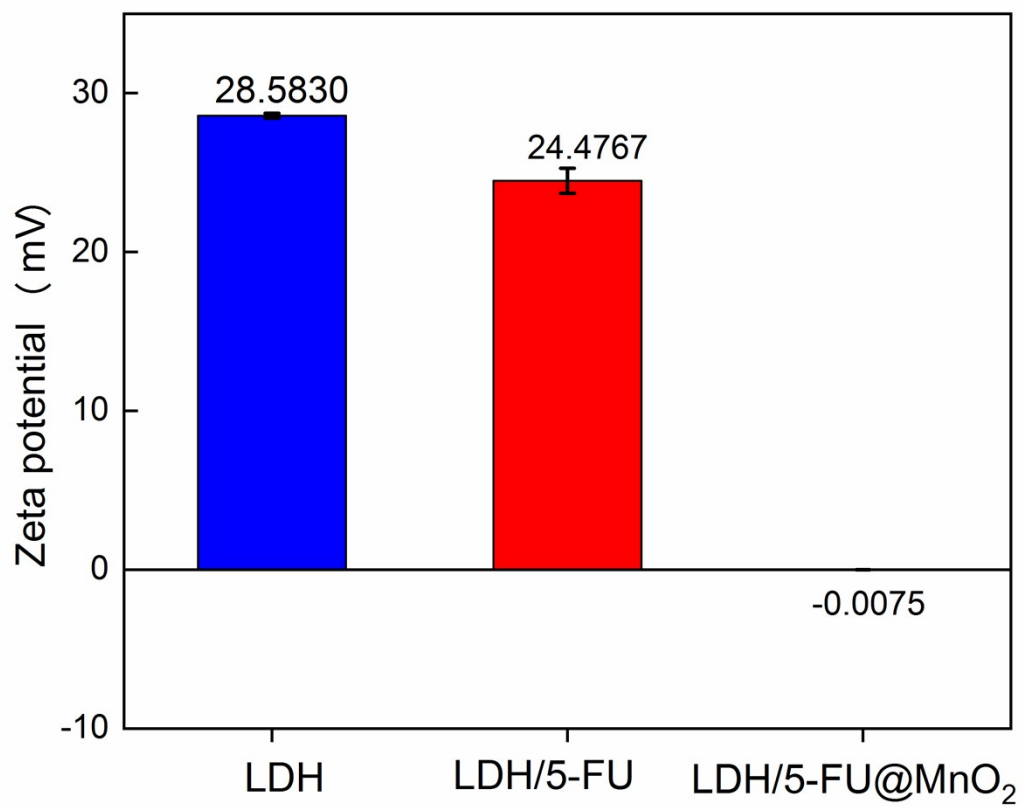


Figure S3. Zeta potential of LDH, LDH/5-FU, LDH/5-FU@MnO₂.

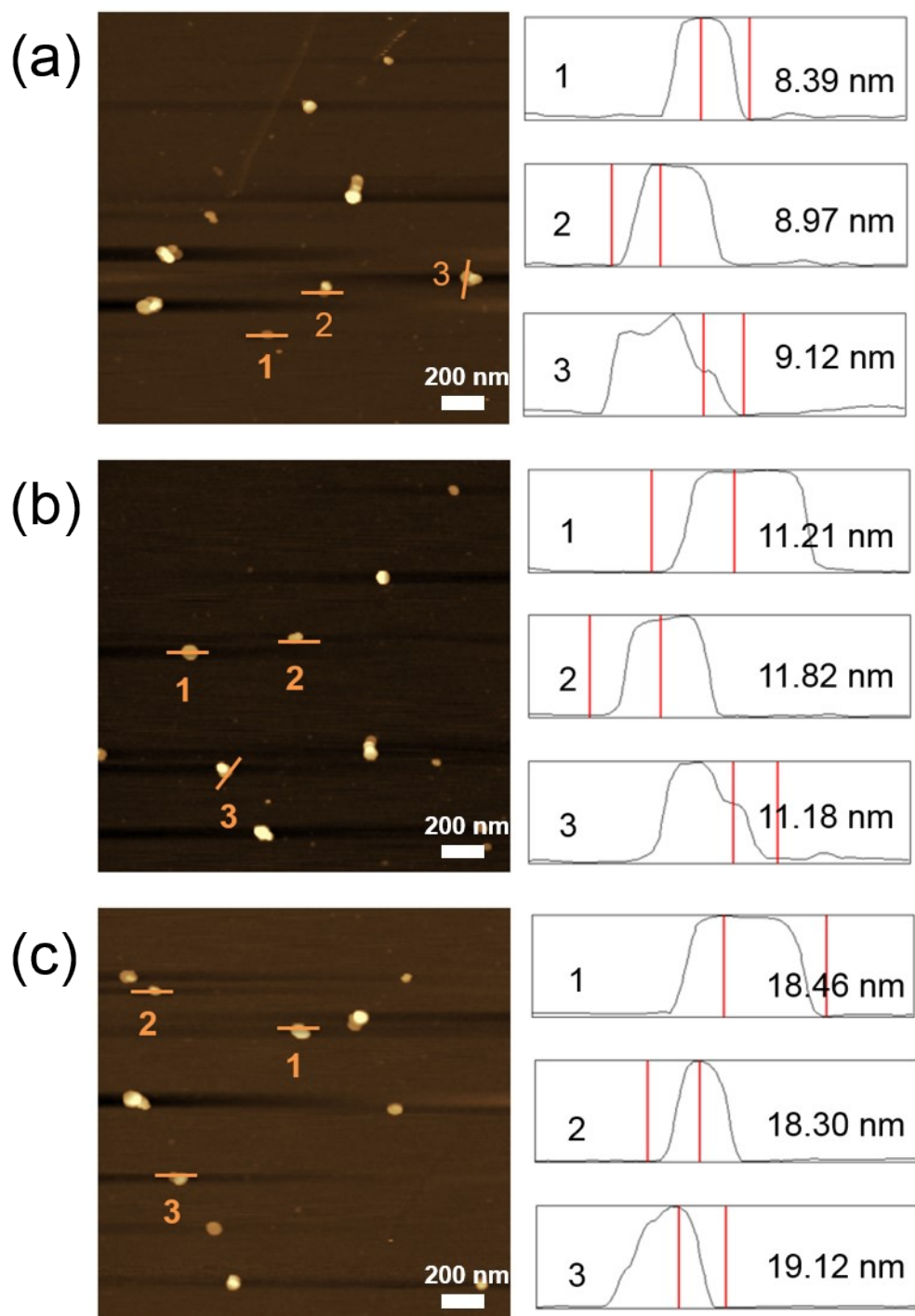


Figure S4. The height image of AFM of LDH (a) LDH/5-FU (b) LDH/5-FU@MnO₂(c).

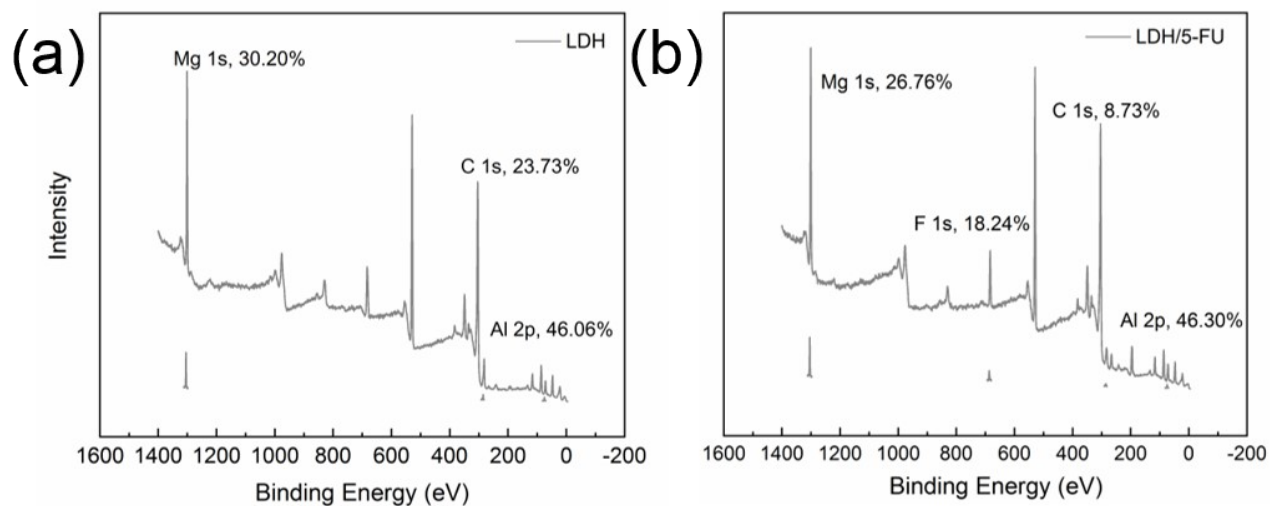


Figure S5. XPS spectra of LDH (a) LDH/5-FU (b).

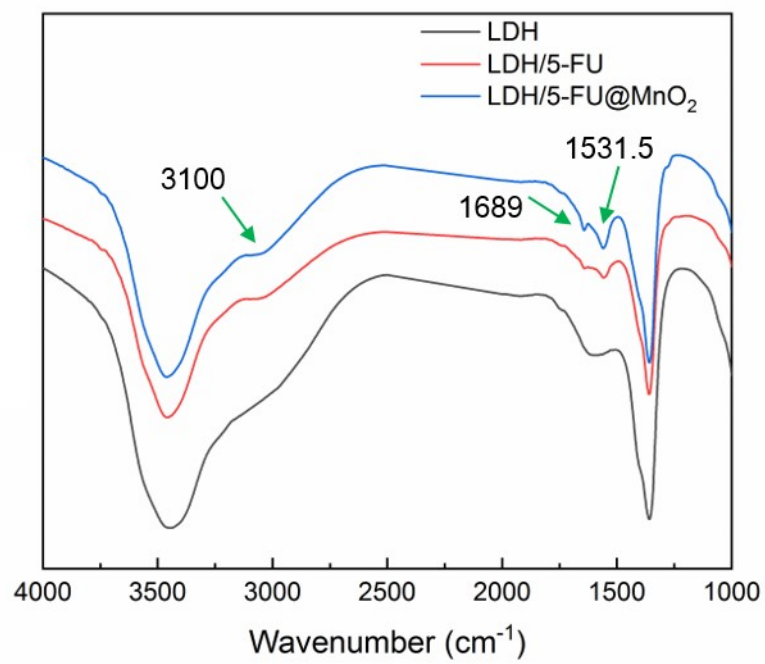


Figure S6. The ART-IR spectrum of LDH, LDH/5-FU, LDH/5-FU@MnO₂, respectively.

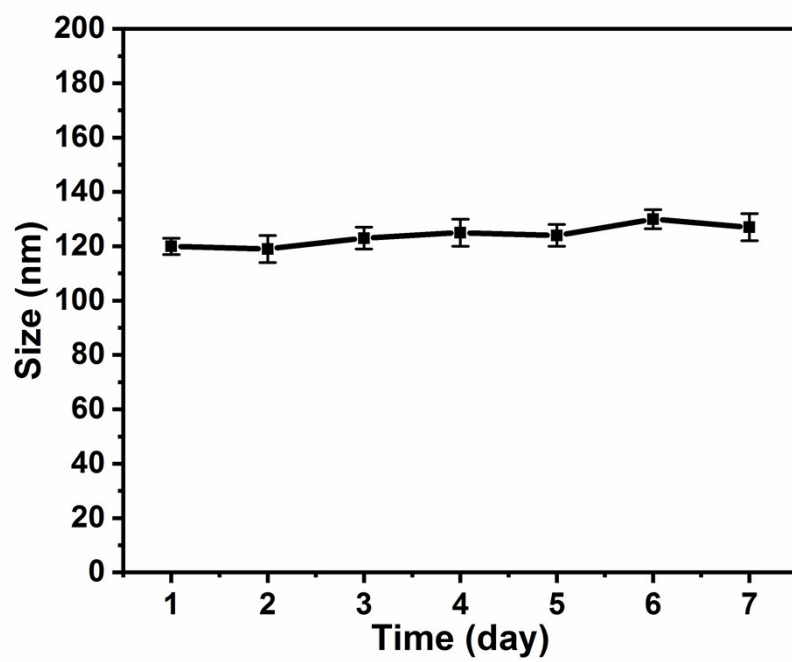


Figure S7. The size stability of LDH/5-FU@MnO₂ in PBS with pH 7.4 for one week.

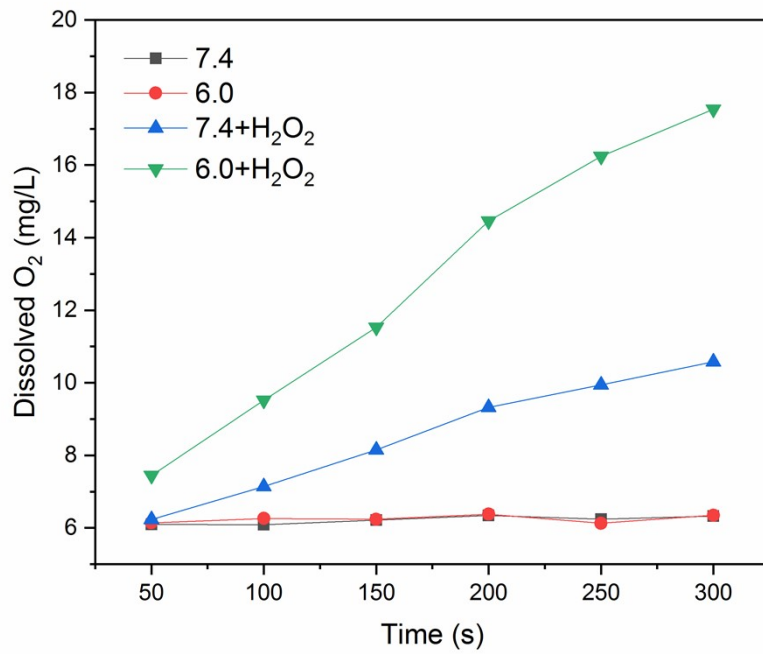


Figure S8. Simultaneous O₂ generation after incubated with PBS solution of pH = 7.4 and 6.0, containing different concentrations of H₂O₂ (0 and 100 × 10⁻³ mM).

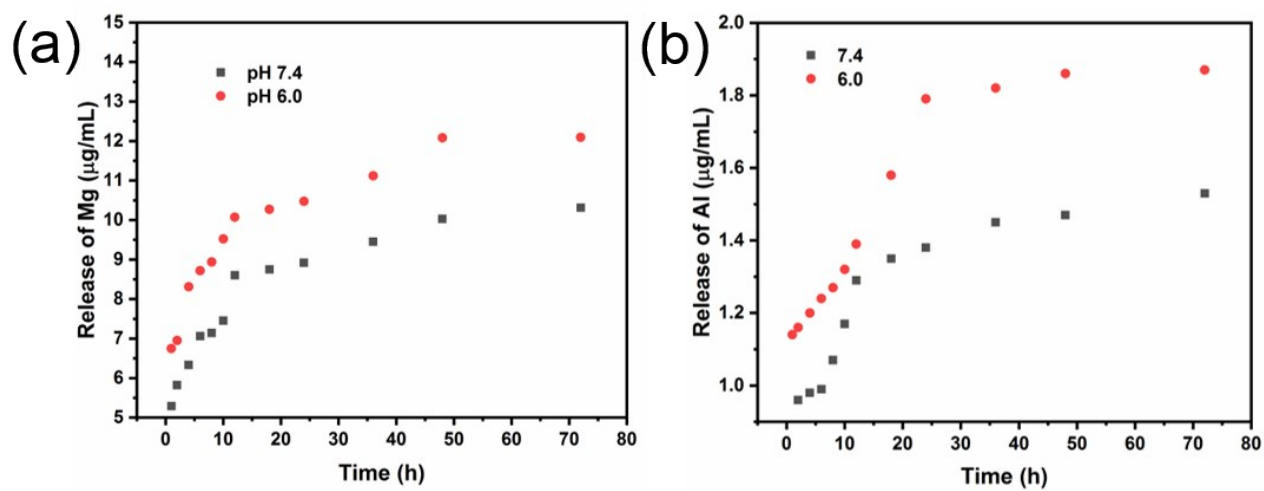


Figure S9. Release profiles of Mg (a) and Al (b) ions from LDH/5-FU@MnO₂ in different pH buffers.

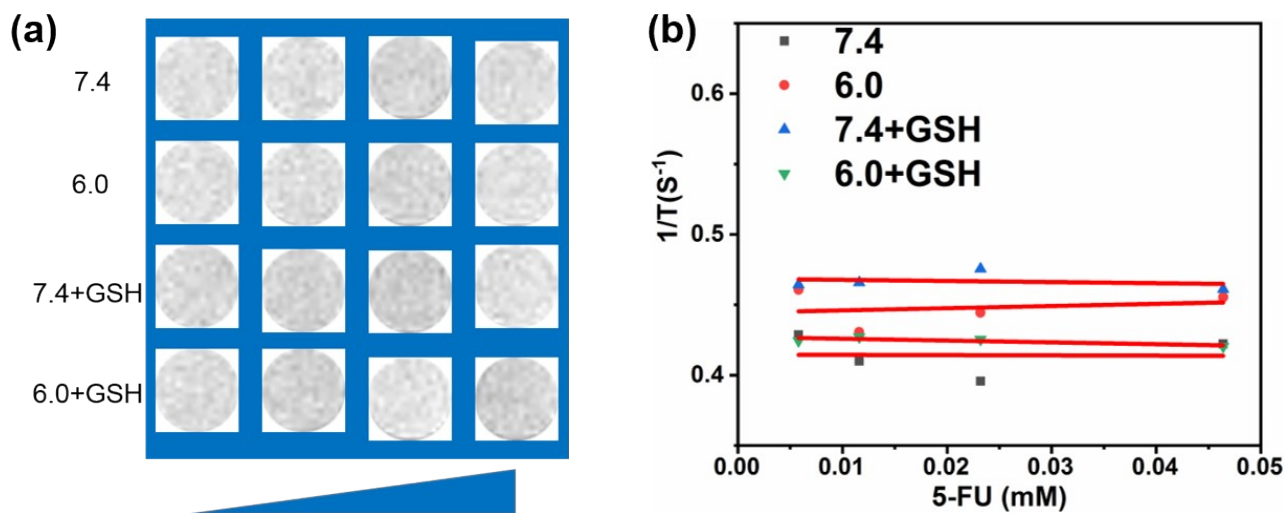


Figure S10. *In vitro* T₁-weighted MRI images (a) of LDH/5-FU when incubated with PBS solution of pH = 7.4 and 6.0, containing different concentrations of GSH (0 and 10 mM) and corresponding relaxation rate r₁ (b).

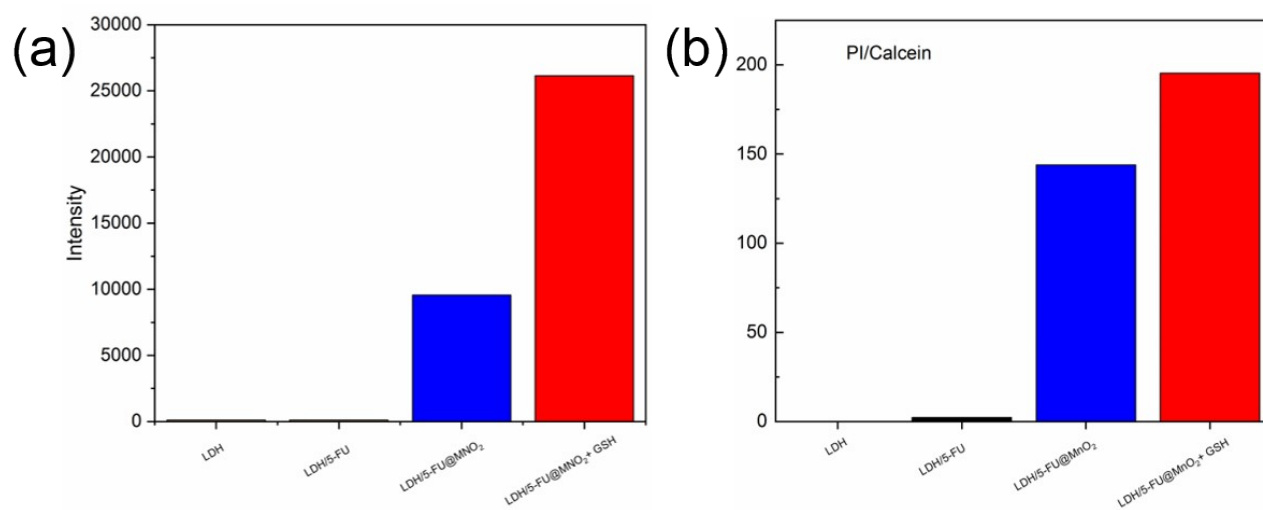


Figure S11. Quantificational analysis of ROS level (a) and the ratio of PI/Calcein (b) of tumor cell with different groups.

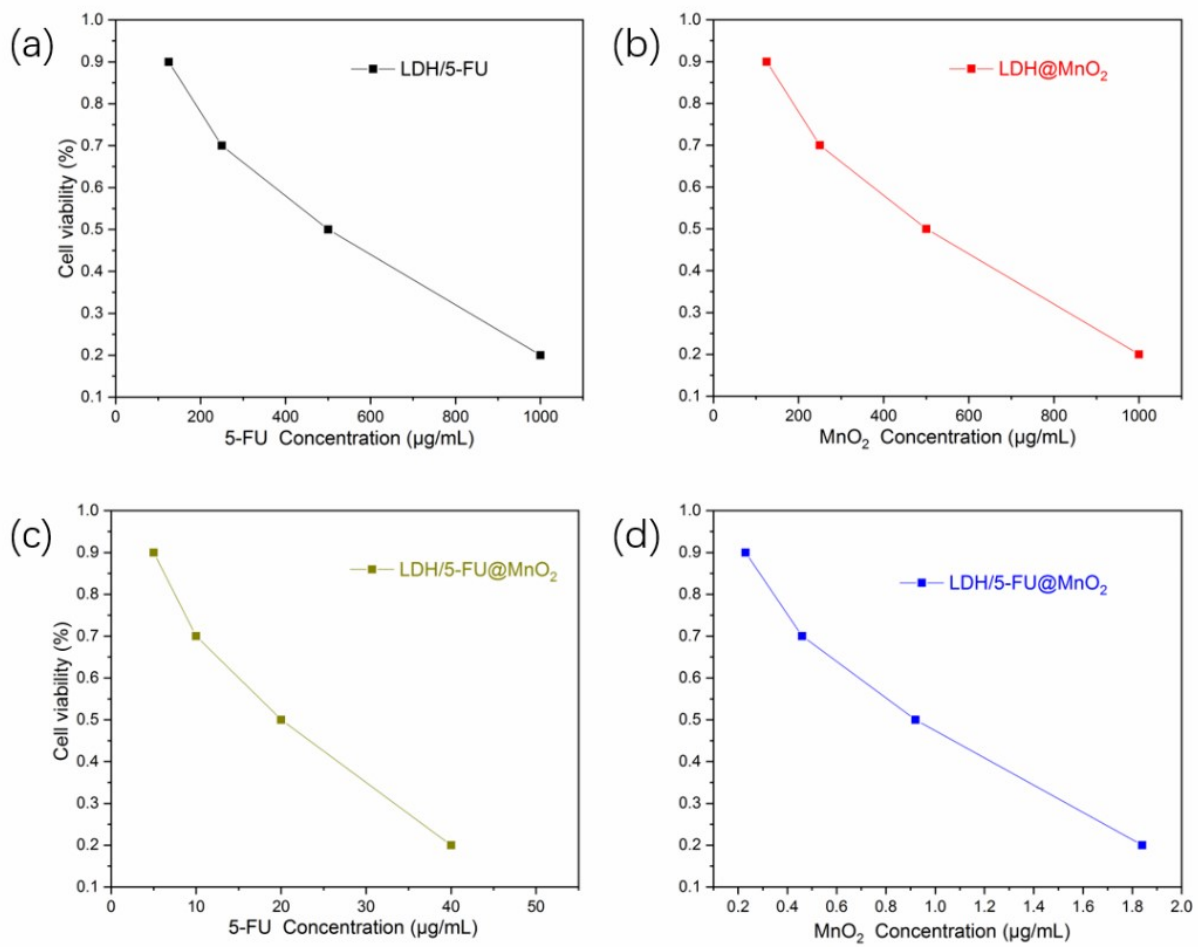


Figure S12. Cell survival rates treated with LDH/5-FU, LDH@MnO₂ or LDH/5-FU@MnO₂ at different concentrations.

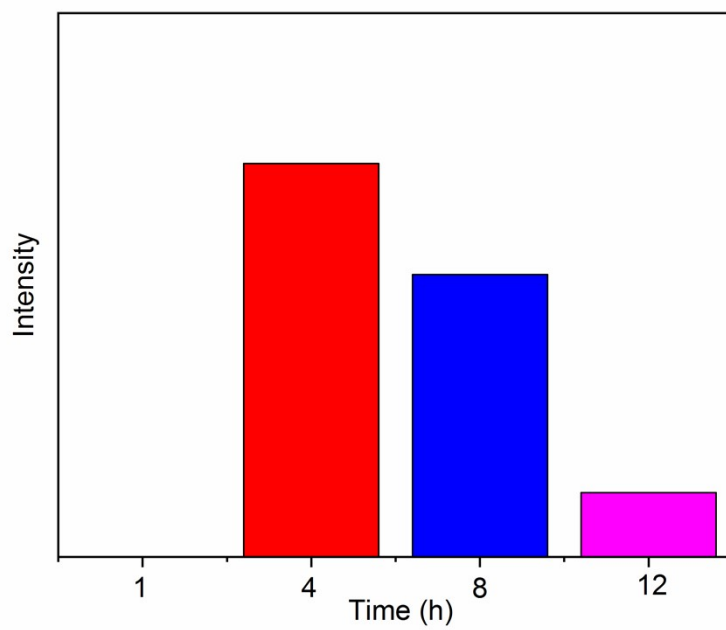


Figure S13. Quantificational analysis of T1-weighted images of LDH/5-FU@MnO₂ in vivo with different time.

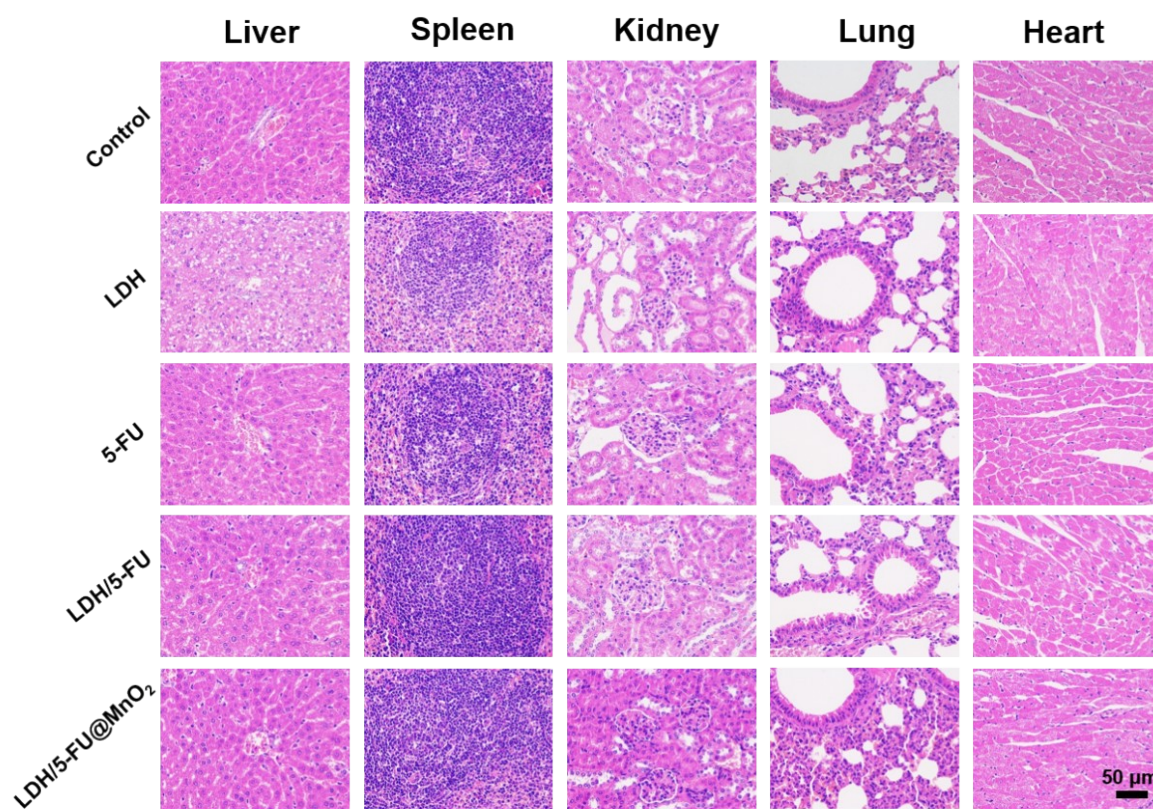


Figure S14. Representative H&E stained sections of liver, spleen, kidney, lung and heart from mice treated with PBS, LDH, 5-FU, LDH/5-FU or LDH/5-FU@MnO₂. The scale bar in the last image applies to the others.

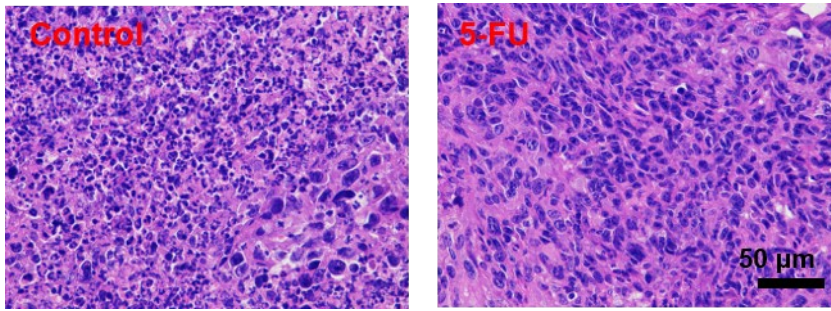


Figure S15. H&E stained images of tumor tissues at 17 days Control, 5-FU treatments.