

Supporting Information

FePt Nanoparticles Embedded in Metal-Organic Framework Nanoparticles for Tumor Imaging and Eradication

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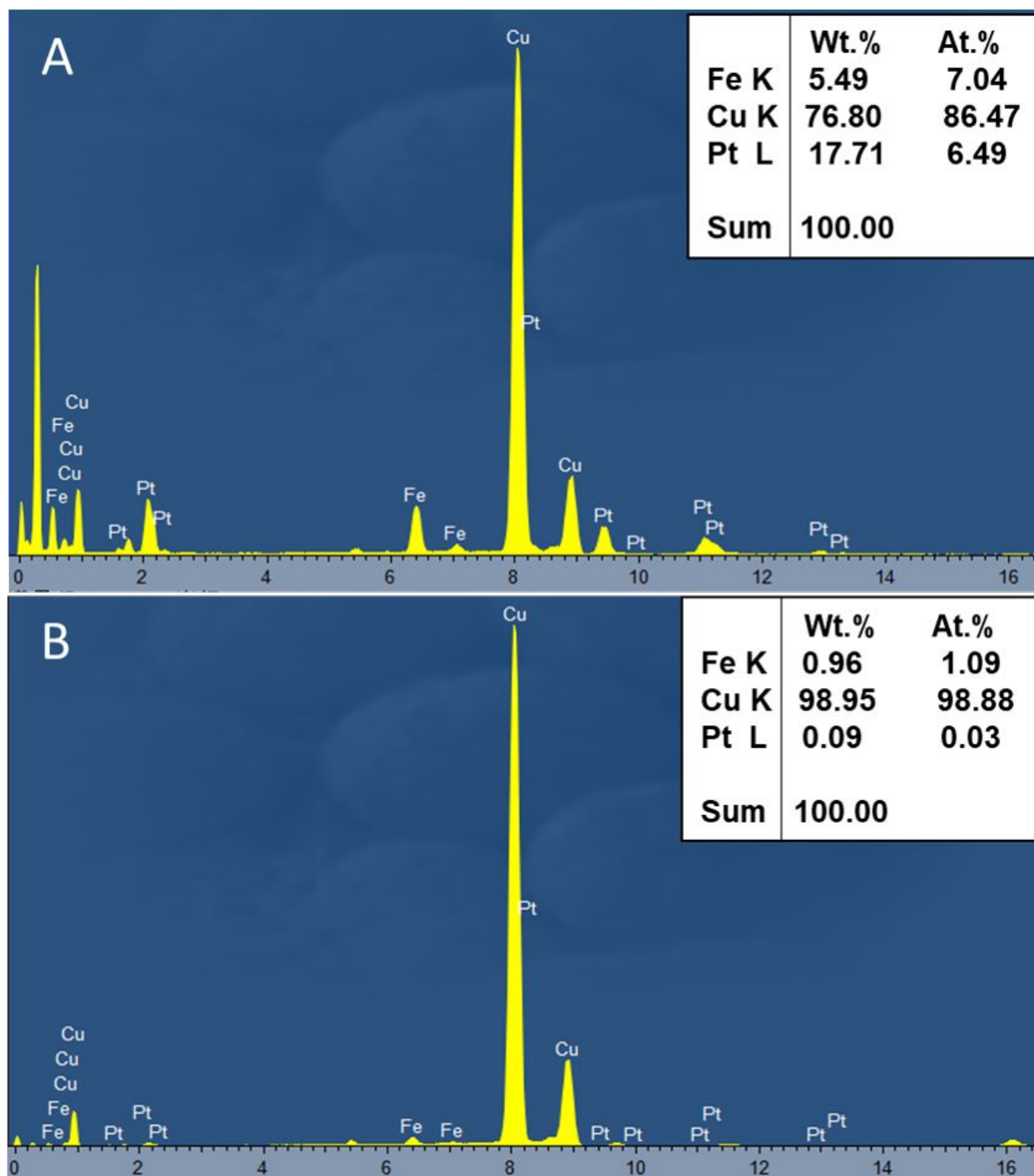


Fig. S1 (A, B) The EDS date of FePt(S) NCs and FePt(R) NCs, respectively.

Conditions Groups	Temperature (°C)	Time (min)	Stir	Natural Cool	Ice-bath Cool	Morphology
1	150	2.5		✓		(A)
2	128	25		✓		(B)
3	165	8		✓		(C)
4	165	8			✓	(D)
5	141	12		✓		(E)
6	141	12			✓	(F)
7	137	12	✓			(G)

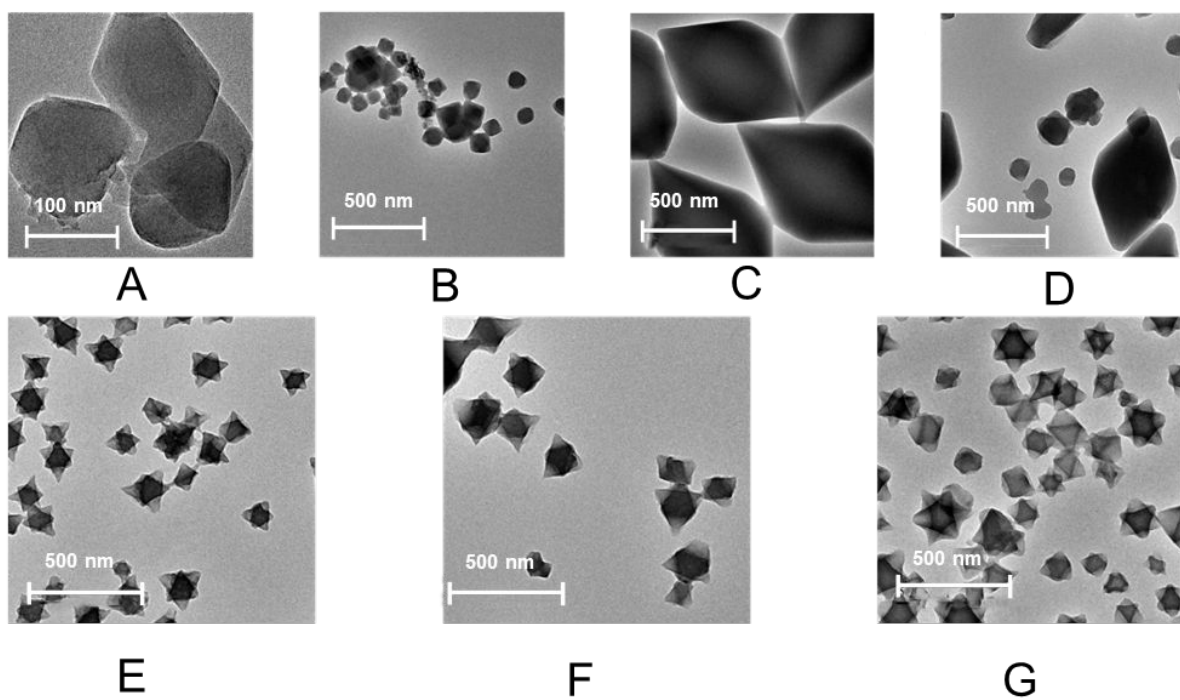


Fig. S2 The conditions for controlling MIL-101(Fe) synthesis.

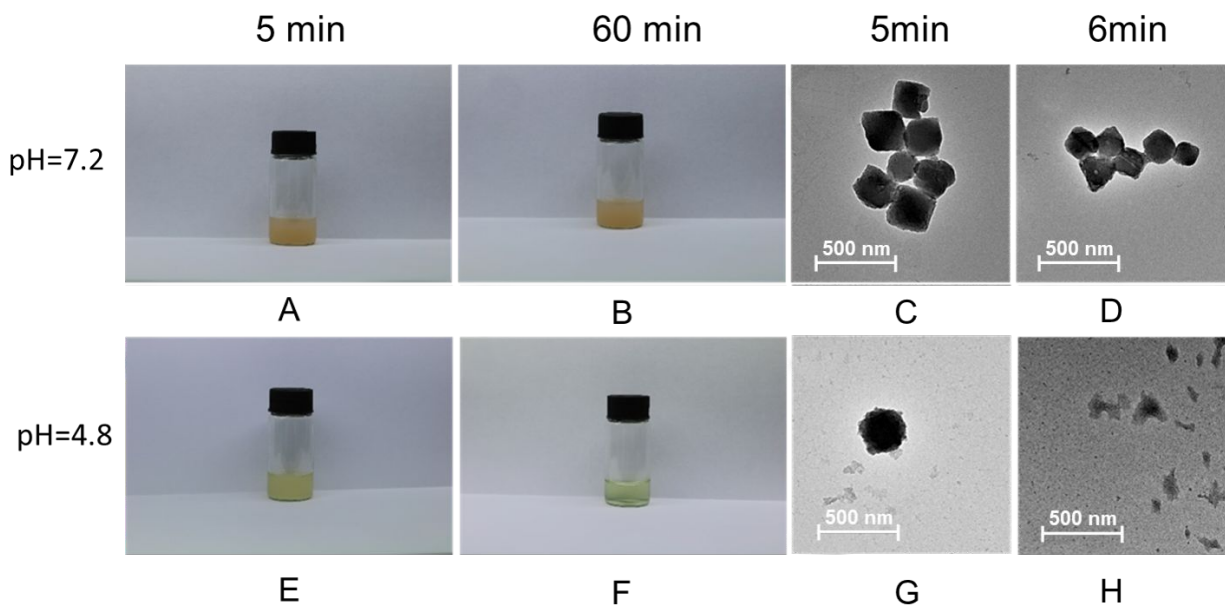


Fig. S3 The stability of the MIL-101(Fe) under the conditions of pH 7.2 and pH 4.8, respectively.

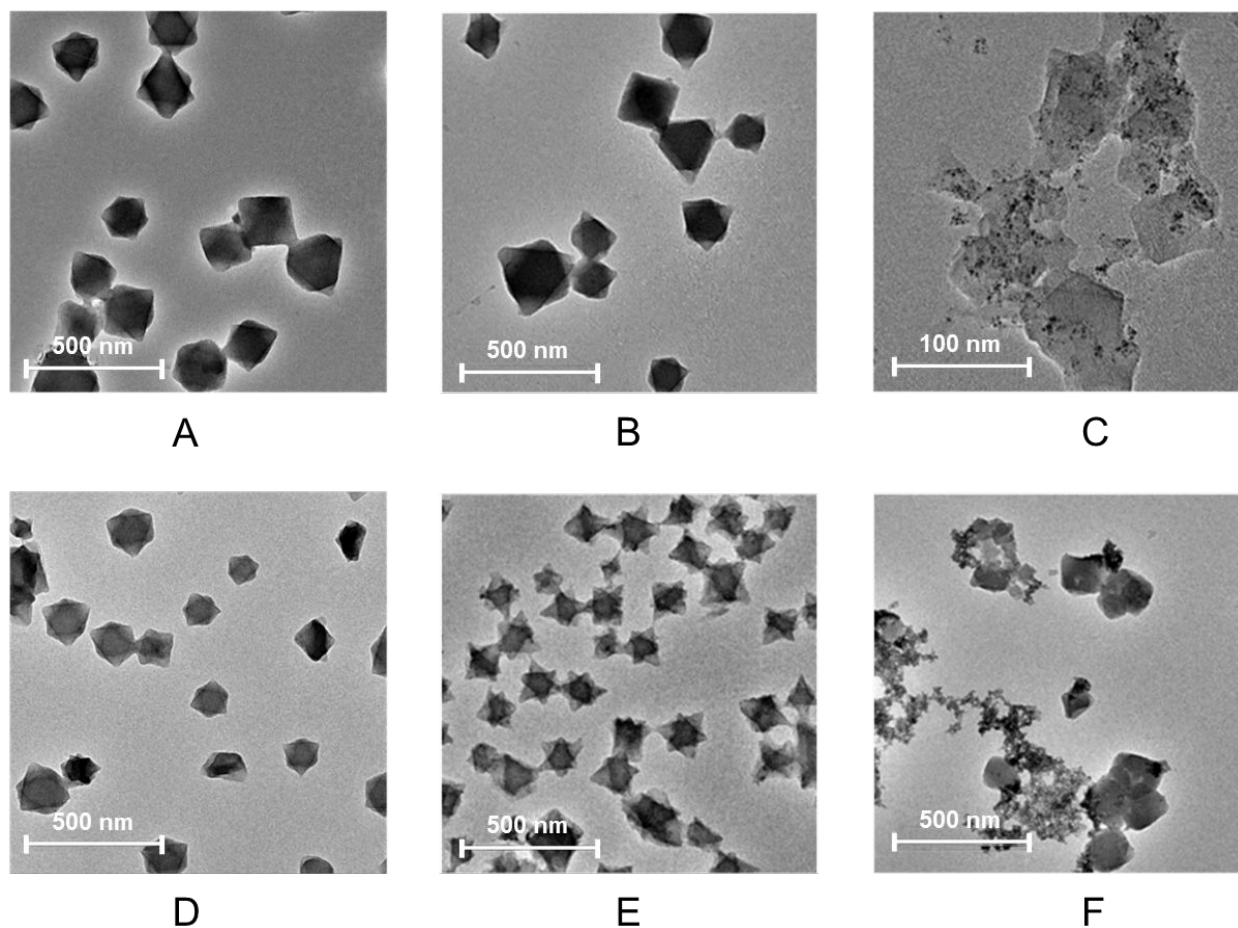


Fig. S4 The loading capacity of the MIL-101(Fe) to FePt(R/S). (A, B, C) FePt(S) (20 mg/ 30 mg/ 40 mg), $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ (0.23 g, 1.384 mol) and PTA (0.402 g, 1.384 mol) were dissolved in 60 mL DMF, heated at 141°C. (D, E, F) FePt(R) (2 mg/ 4 mg/ 6 mg), $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ (0.23 g, 1.384 mol) and PTA (0.402 g, 1.384 mol) were dissolved in 60 mL DMF, heated at 141°C.

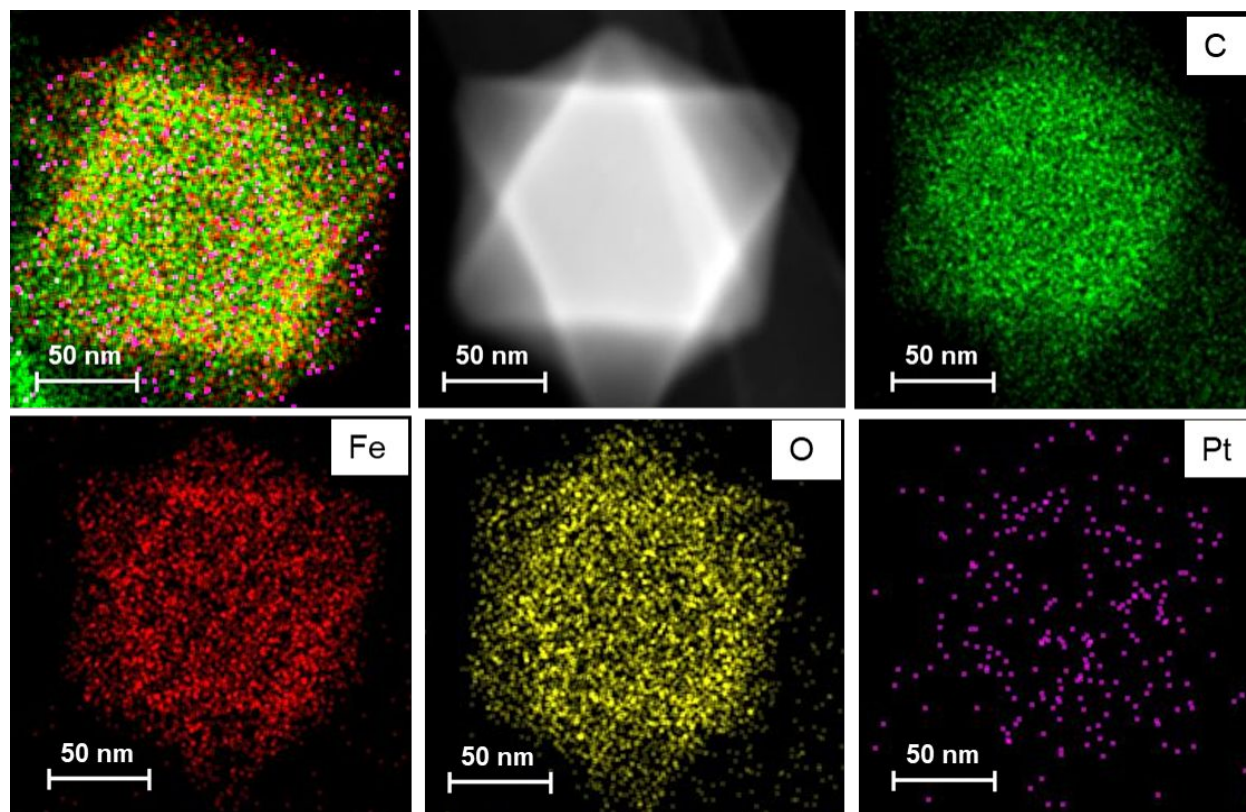


Fig. S5 HAADF STEM image of FePt(R)-MOF nanocomposites. Corresponding elemental mapping of FePt(R)-MOF nanocomposites.

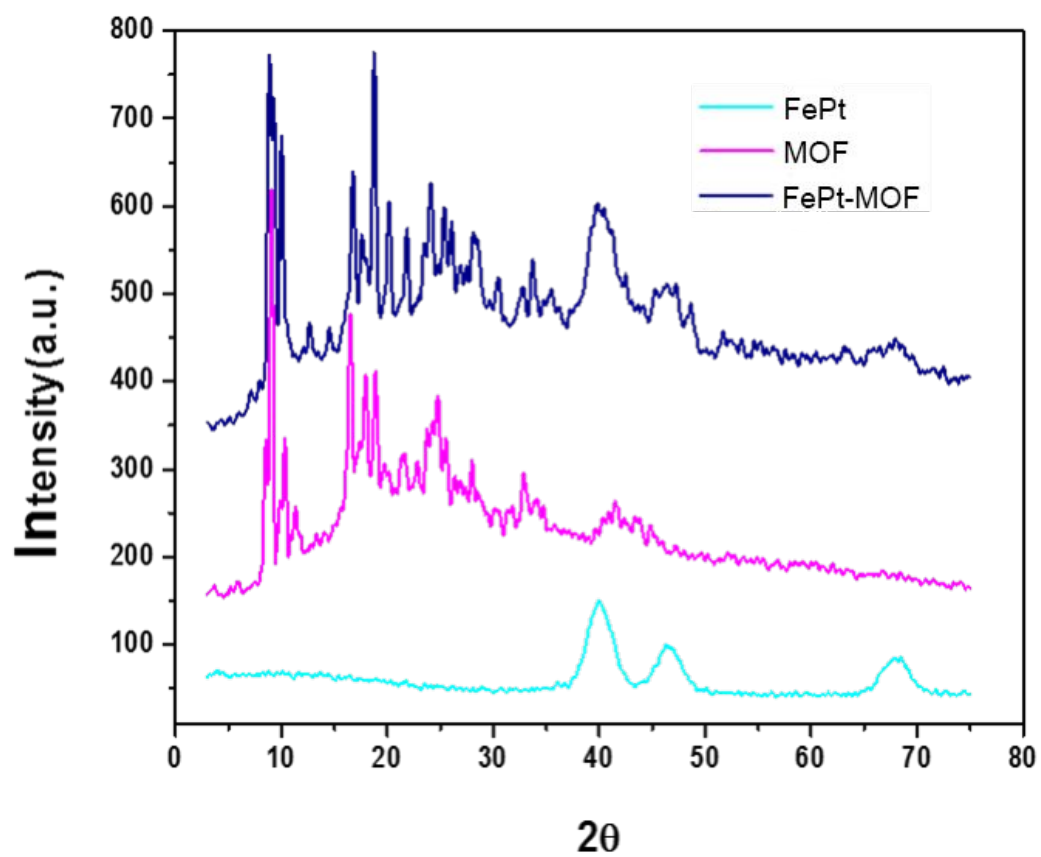


Fig. S6 XRD patterns of FePt, MOF and FePt-MOF NCs.

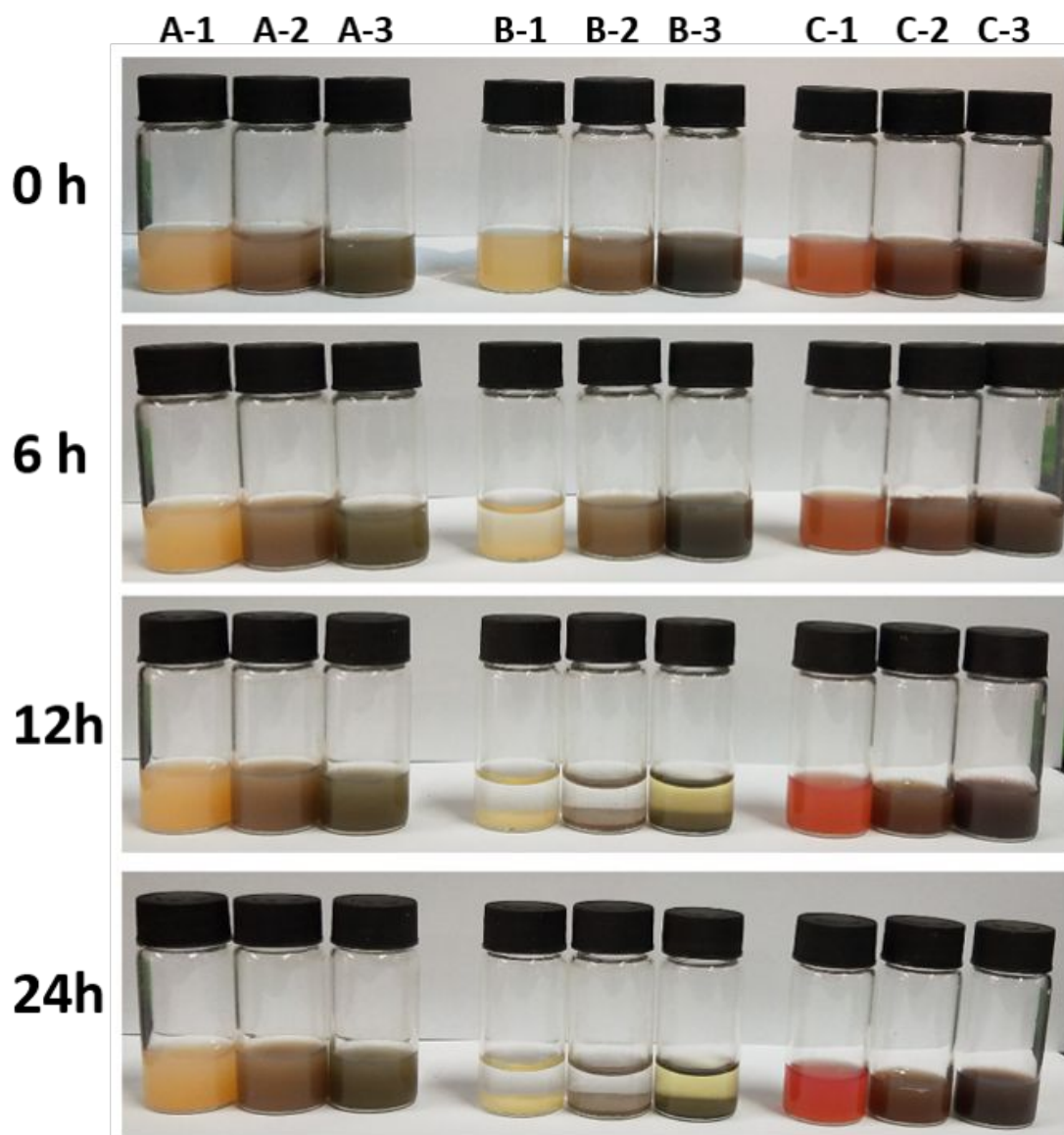


Fig. S7 The dispersion of the as-prepared MOF (1), FePt(R)-MOF-tLyp (2) and FePt(S)-MOF-tLyp-1 (3) were dissolved in H₂O (A), PBS (B) and DMEM medium (C) for 0, 6, 12 and 24 h, respectively.

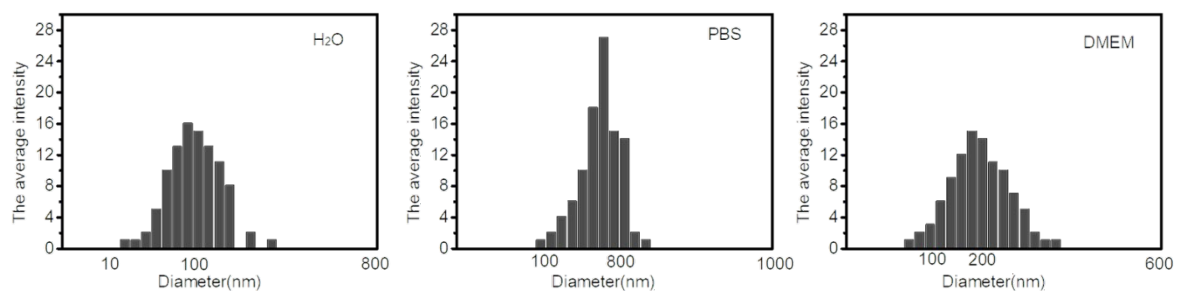


Fig. S8 The size of MOF after 24 h in H₂O, PBS and DMEM medium, respectively.

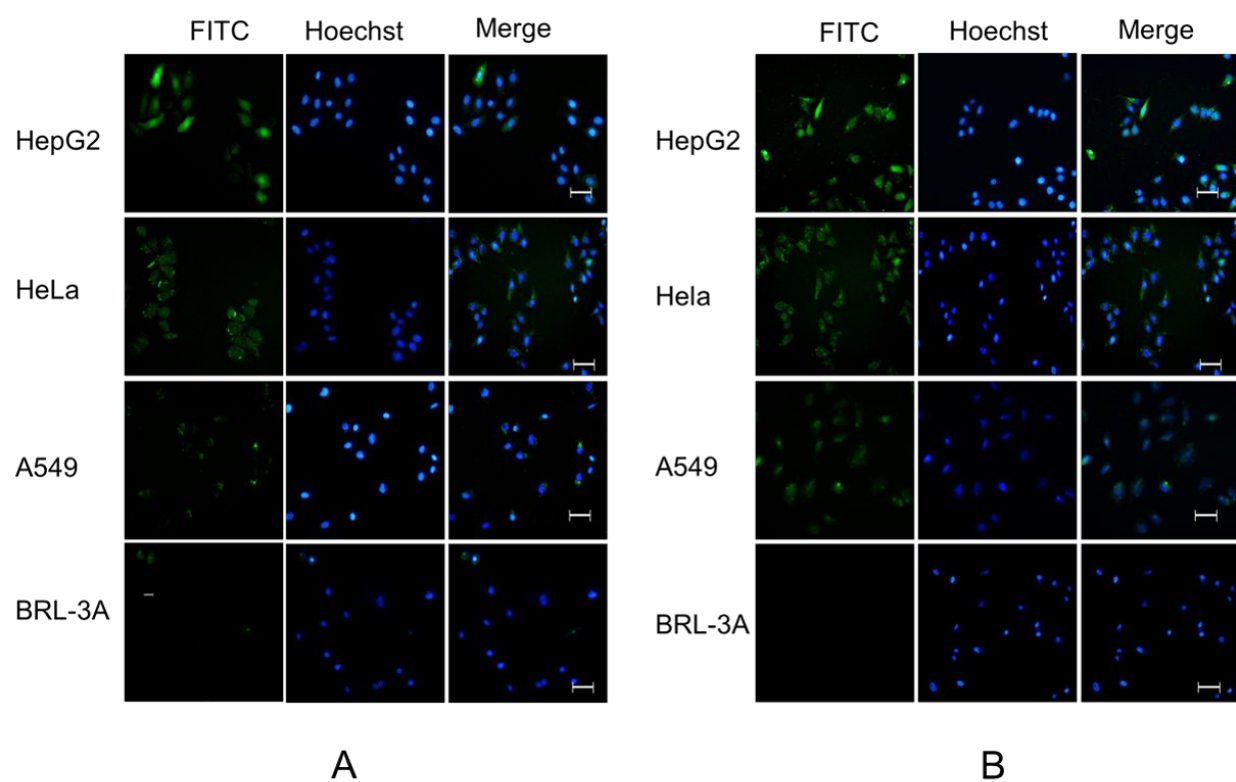


Fig. S9 The fluorescence image of FePt(S)-MOF-tLyp-FITC NCs (A) and FePt(R)-MOF-tLyp-FITC NCs (B) , respectively. (scale bars: 200 μm)

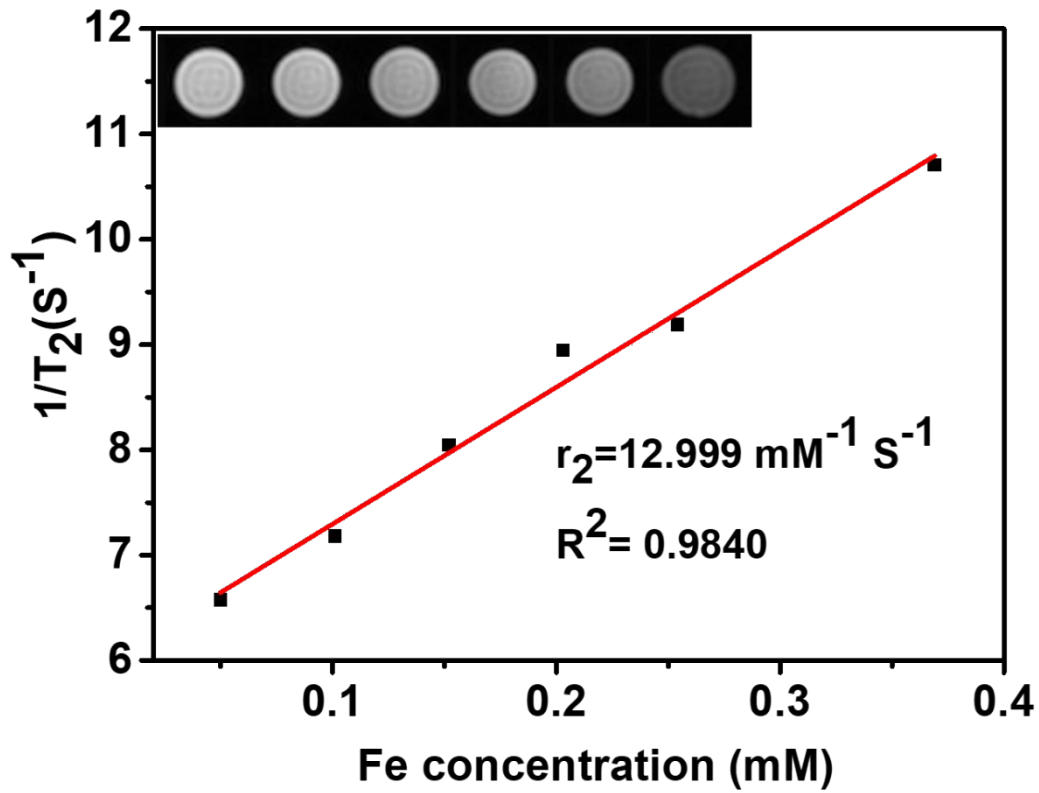


Fig. S10 The MR imaging ($1/T_2$) of FePt-MOF NCs treated with 4T1 cells. Relaxivity values were obtained from the slopes of linear fits of experimental data. (Inset: T_2 -Weighted MR images of different concentrations of FePt-MOF nanocomposites)

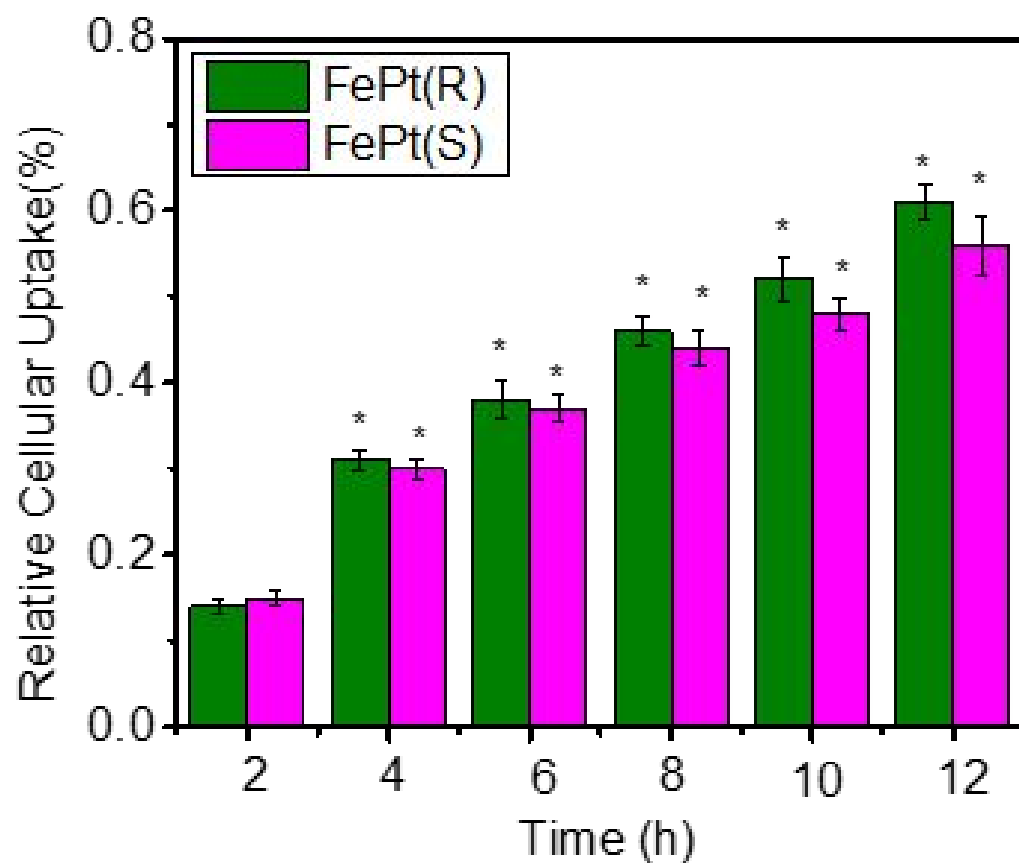


Fig. S11 The relative cellular uptake of FePt(S)-MOF-tLyp NCs and FePt(R)-MOF-tLyp NCs toward 4T1 and L02 cells under different incubation times at the Fe concentration of 30 $\mu\text{g/mL}$. (* $p < 0.05$, t-test)

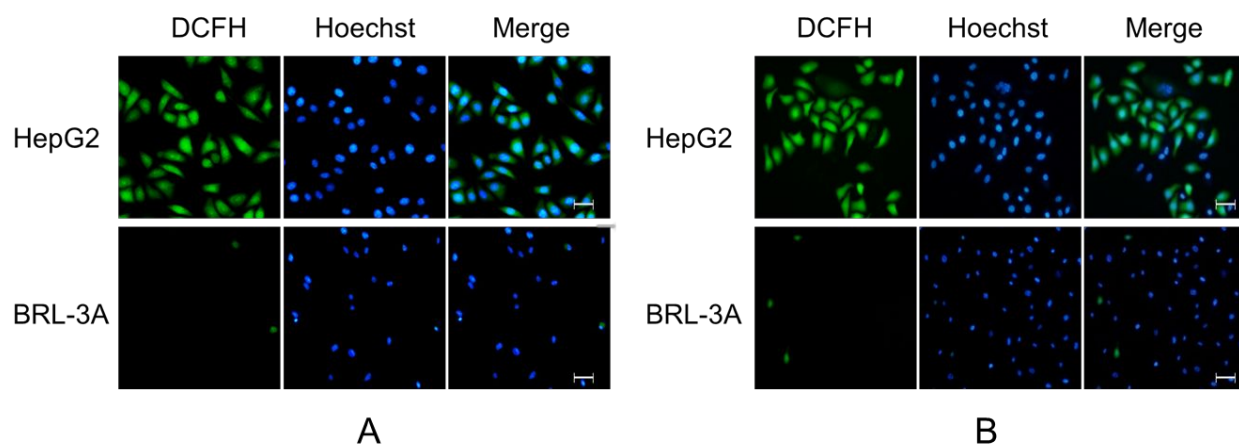


Fig. S12 Fluorescence microscopy images of DCFH-DA labeled HepG2 and BRL-3A cells incubated with FePt(S)-MOF-tLyp-1 NCs (A) and FePt(R)-MOF-tLyp-1 NCs (B) for 8h at the Fe concentration of 25 mg mL^{-1} , respectively. (scale bars: $200 \text{ }\mu\text{m}$)

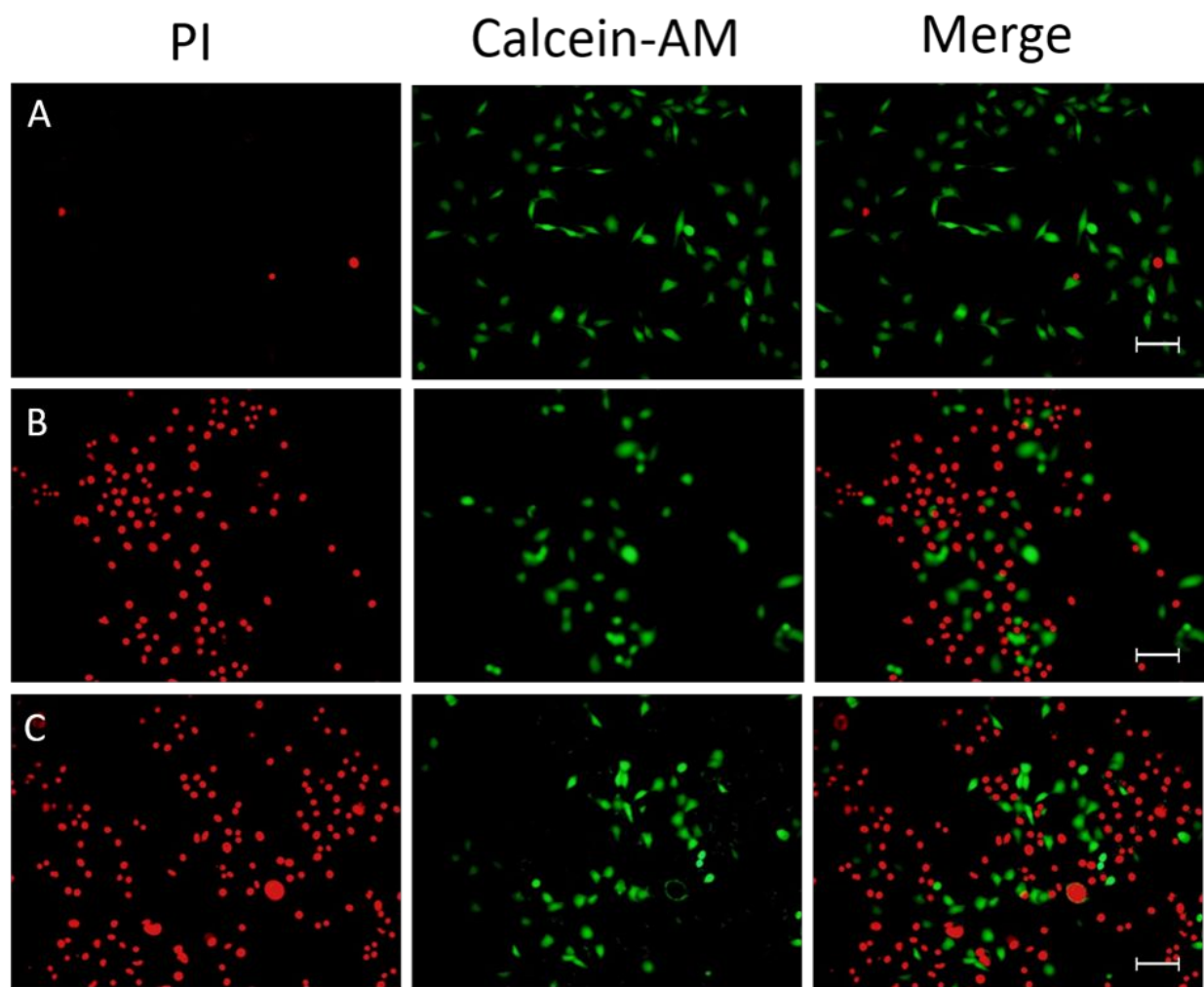


Fig. S13 Fluorescent images of 4T1 cells co-stained by Calcein-AM (green fluorescence, live cells) and PI (red fluorescence, dead cells) of different treatments (A: Control, B: FePt(S)-MOF-tLyp-1 NCs, C: FePt(R)-MOF-tLyp-1 NCs. (scale bars: 200 μ m)

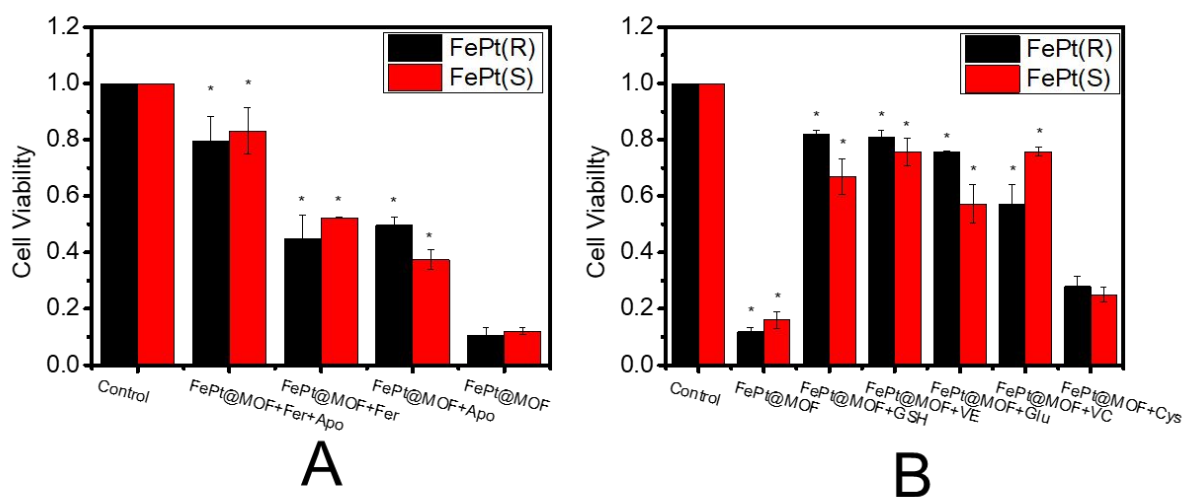


Fig. S14 (A) The corresponding survival rates of FePt-MOF-tLyp-1 NCs , FePt-MOF-tLyp-1 NCs + Lip-1 + Apo, FePt-MOF-tLyp-1 NCs + Lip-1 and FePt-MOF-tLyp-1 NCs + Apo loaded 4T1 cells. (B) Viabilities of 4T1 cells processed with FePt-MOF-tLyp-1 NCs, FePt-MOF-tLyp-1 NCs +VE, FePt-MOF-tLyp-1 NCs +VC, FePt-MOF-tLyp-1 NCs +Glu, FePt-MOF-tLyp-1 NCs + GSH and FePt-MOF-tLyp-1 NCs +Cys. (* $p < 0.05$, t-test)

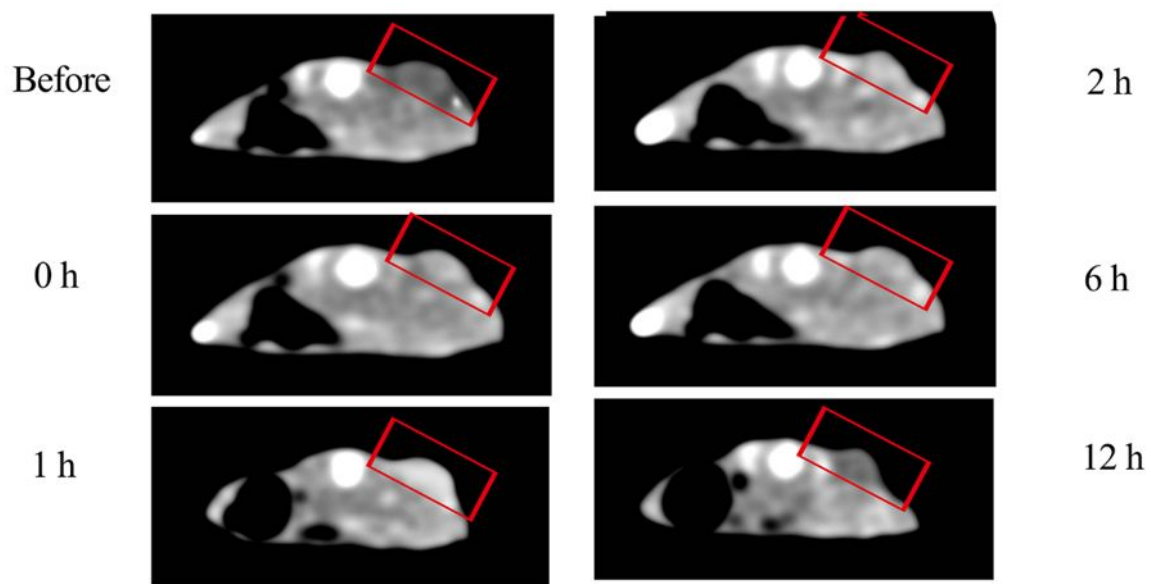
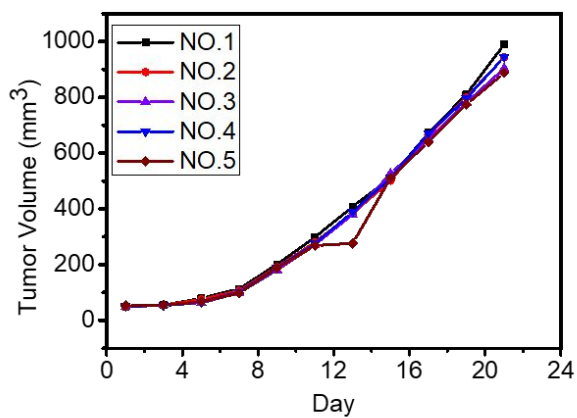
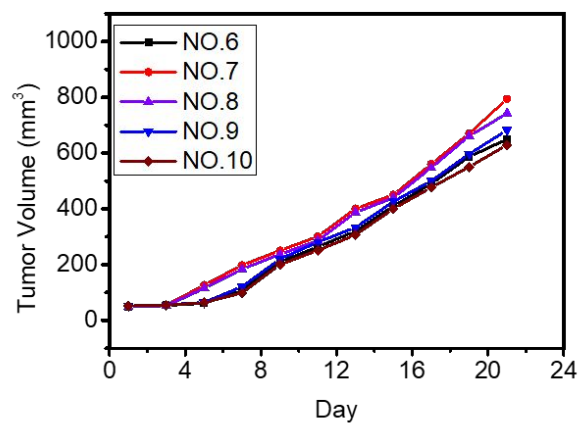


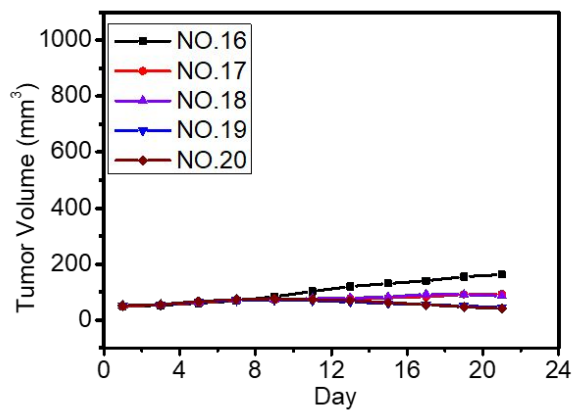
Fig. S15 In vivo CT imaging (axial plane) of a 4T1 tumor-bearing mouse at different time intervals after intravenous injection with FePt-MOF-tLyp-1 NCs. Tumor tissue was indicated with red pane.



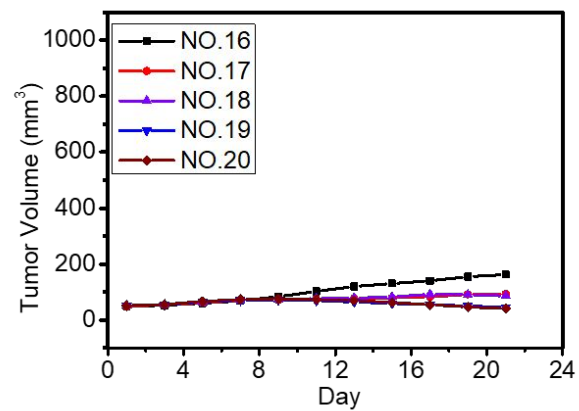
A



B



C



D

Fig. S16 The body weight of every mouse during different treatments.

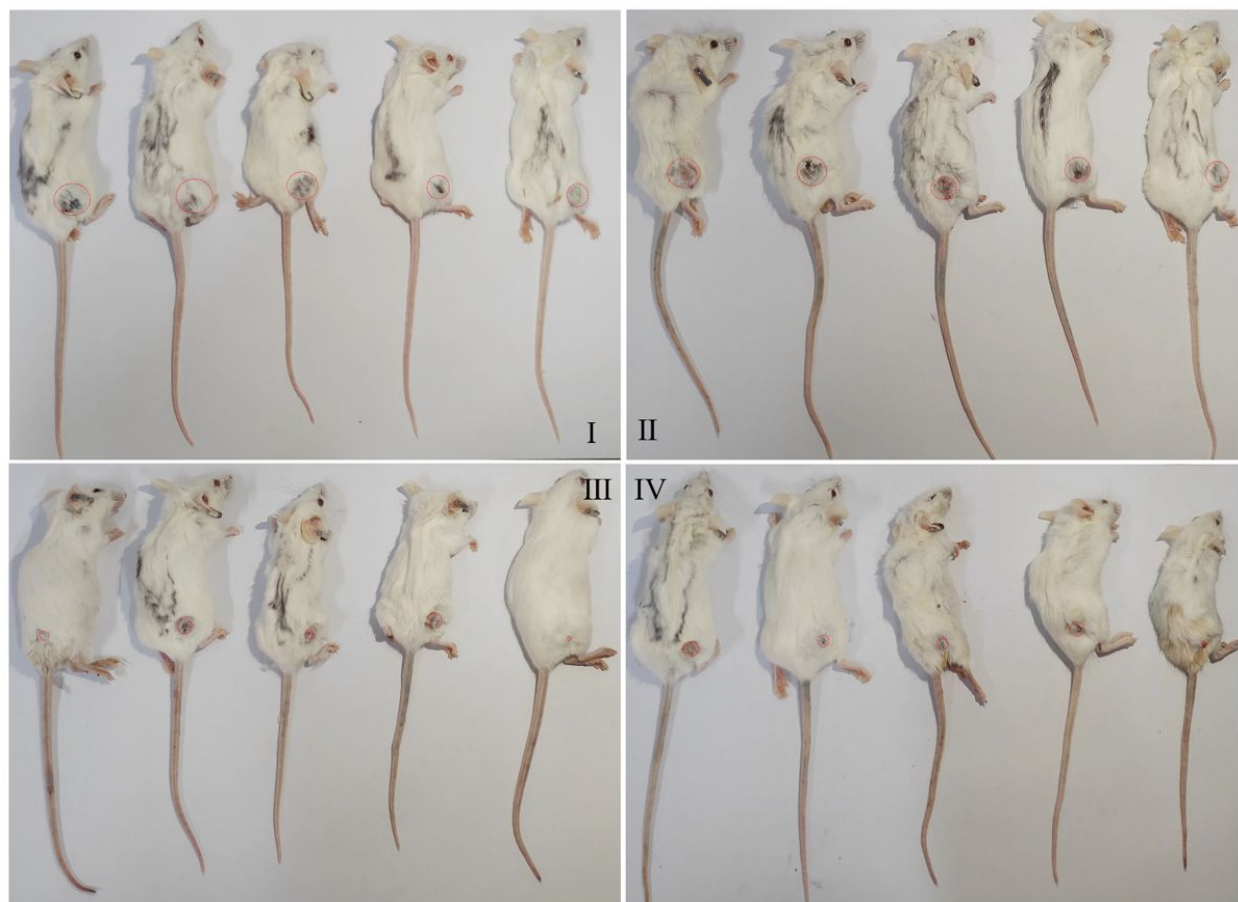
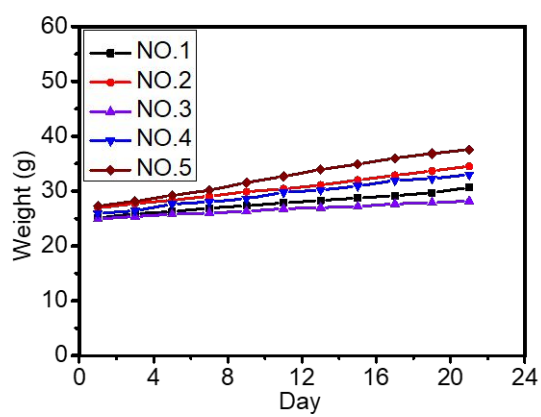
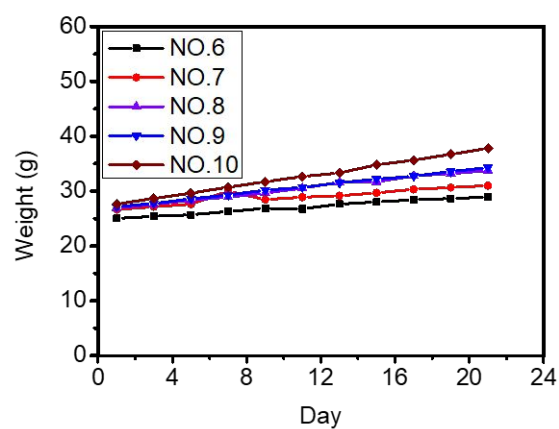


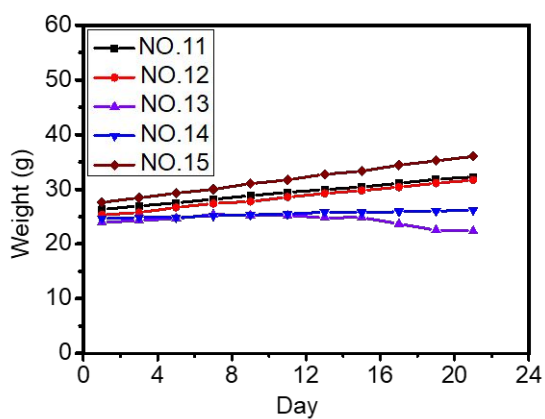
Fig. S17 The images of mouse for different groups. (I : PBS; II : MOF-tLyp-1; III: FePt(R)-MOF-tLyp-1; IV: FePt(S)-MOF-tLyp-1).



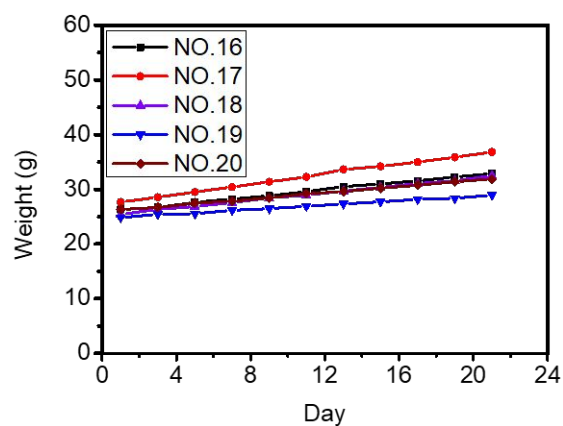
A



B



C



D

Fig. S18 The volume of tumors in tumor-bearing mice of every mouse during different treatments.

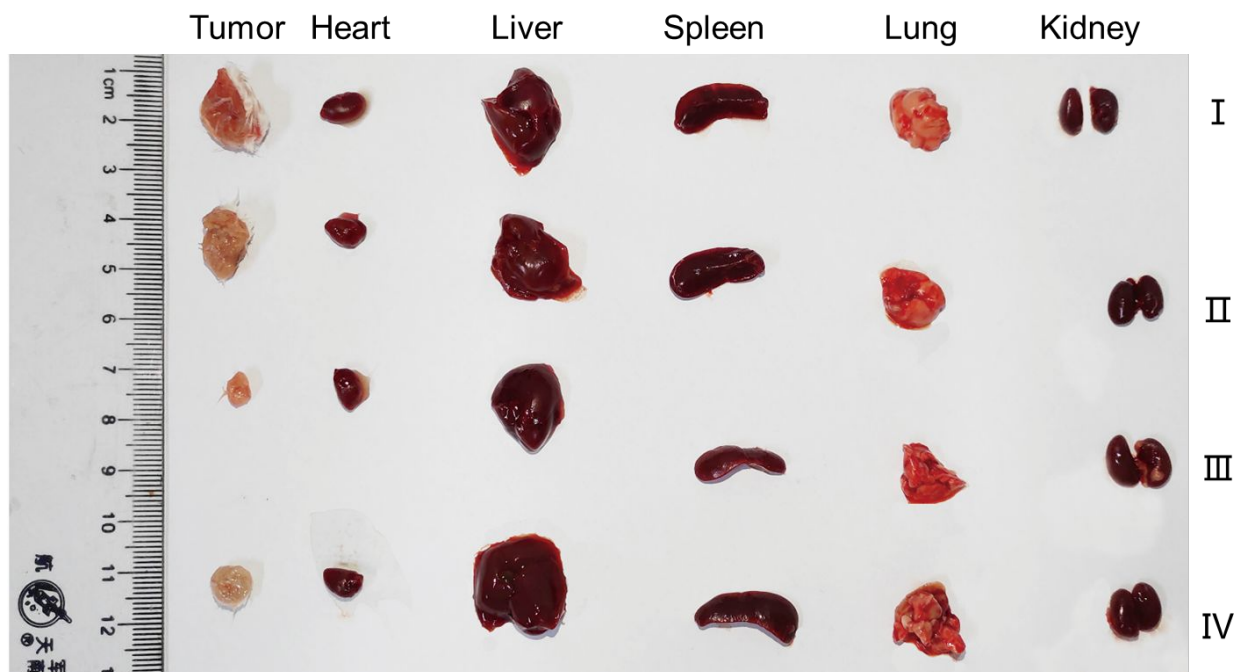


Fig. S19 The photographs of major organs and tumors after various treatments. (I : PBS; II : MOF-tLyp-1; III: FePt(R)-MOF-tLyp-1; IV: FePt(S)-MOF-tLyp-1)