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Supporting Information

Novel redox-responsive polymeric magnetosomes with tunable magnetic resonance property for *in vivo* drug release visualization and dual-modal cancer therapy

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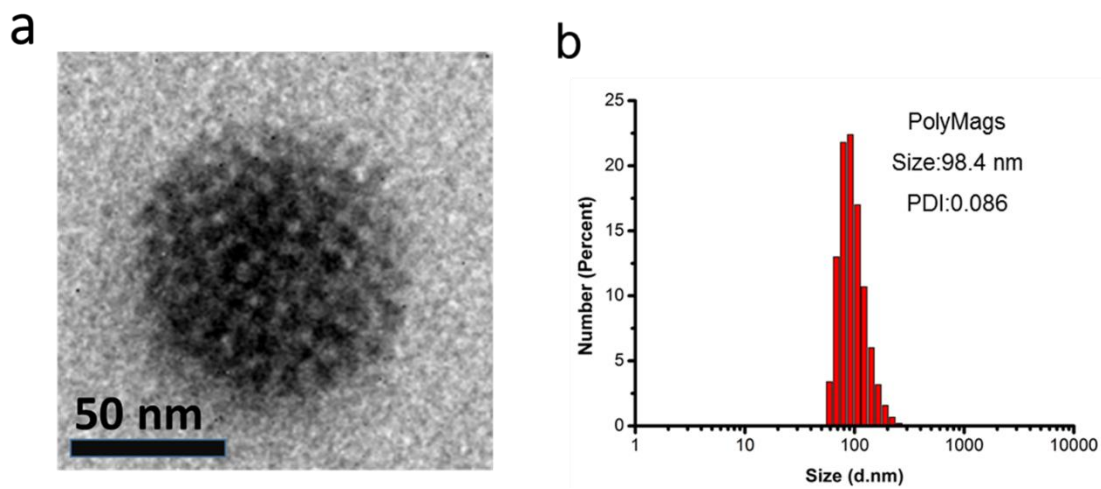
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17 **Figure. S1** a) TEM micrograph of empty PolyMags. b) Size distributions of empty PolyMags
18 nanoparticles tested by DLS. PDI:0.086; size: 98.4 nm.
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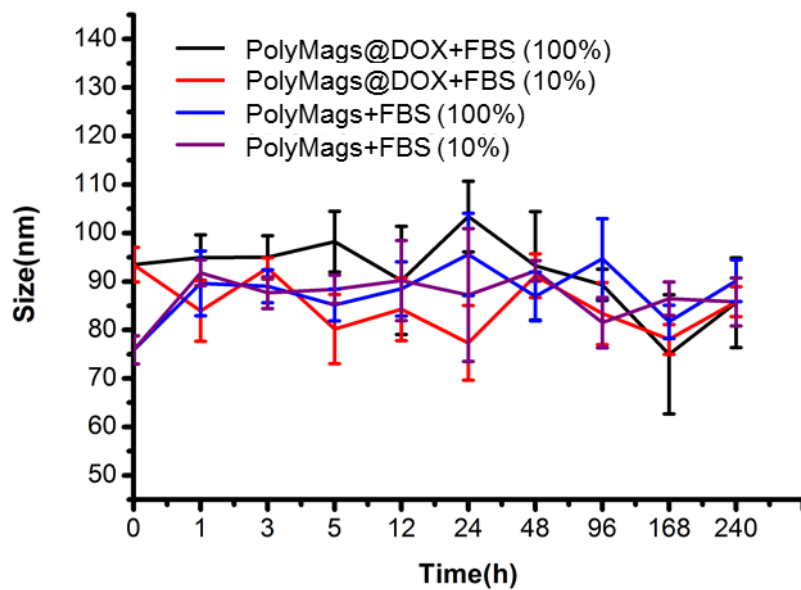


Figure. S2. The stability studies in particle size changes of the PolyMags@DOX (2 mg/mL) and empty PolyMags in fetal bovine serum (FBS). Empty PolyMags and PolyMags@DOX nanoparticles were incubated with FBS (100% and 10%). The size distribution of the nanoparticles was measured by DLS instrument after incubation with FBS at different time points from 0 to 240 h.

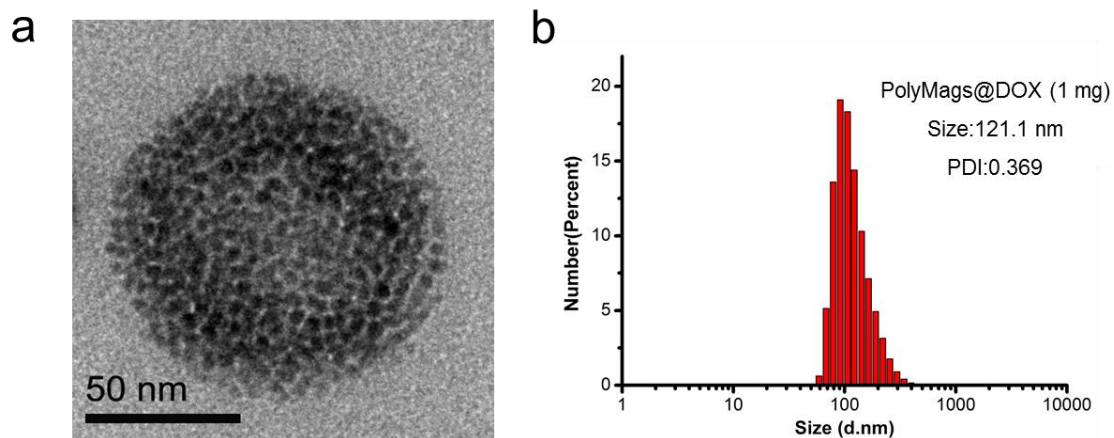


Figure. S3. a) TEM micrograph of the PolyMags@DOX (1 mg/mL). b) Size distributions of the PolyMags@DOX (1 mg/mL) nanoparticles tested by DLS. PDI:0.086; size: 121.1nm.

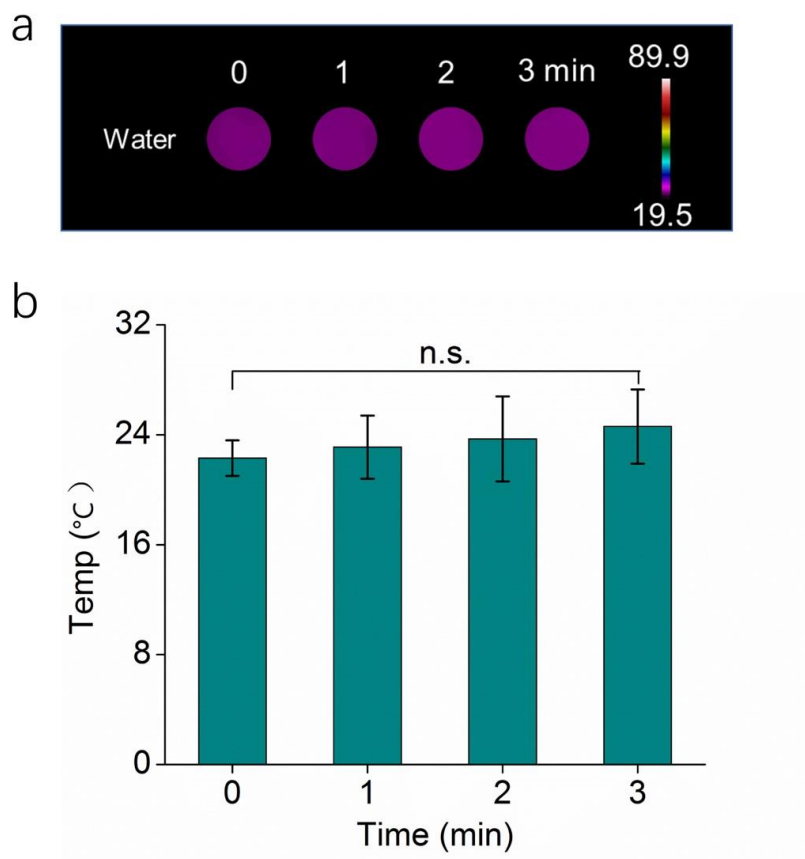


Figure. S4. a) Thermal images and b) quantitative temperature change (n=3). The results were shown as the mean \pm s.d. The temperature of water was monitored by a thermal camera after irradiation with NIR laser (680 nm) at 0.8 w/cm² at different time point (0, 1, 2, and 3 min). Statistical analysis was performed with a two-tailed Student's t-test, n.s. p>0.05.

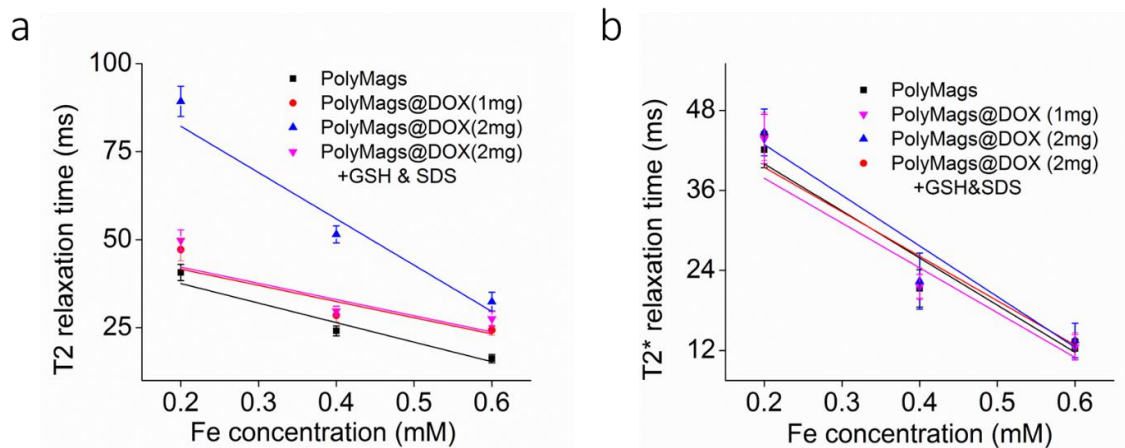


Figure. S5. T2 and T2* relaxation time of empty PolyMags, the PolyMags@DOX (1 mg/mL) and the PolyMags@DOX (2 mg/mL) treated with GSH in the presence of SDS negatively correlated with Fe concentration. Statistical analysis was performed with Pearson correlation.

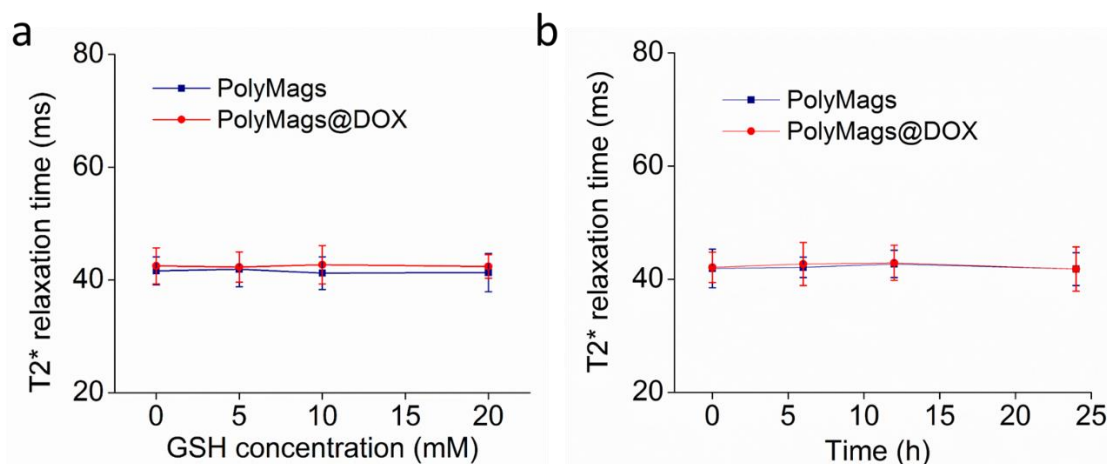


Figure. S6. Time-dependent T_2^* MRI activation of the nanoprobe. a), No changes in the T_2^* activation of empty PolyMags and the PolyMags@DOX (2 mg/mL) at 0, 5, 10 and 20 mM concentration of GSH. b), No changes in the T_2^* of empty PolyMags and the PolyMags@DOX (2 mg/mL) were observed at 20 mM concentration of GSH at different time points.

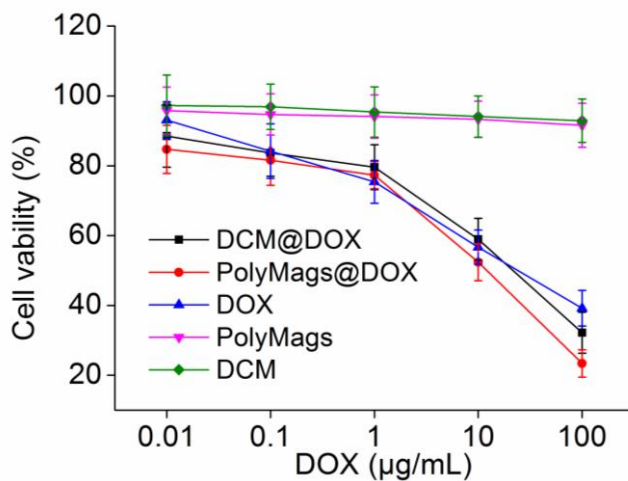


Figure. S7. Cell viabilities of the PolyMags@DOX (2 mg/mL), empty PolyMags, DCM@DOX, free DOX and DCM by MTS assay. MCF-7 cells were treated with various concentrations of DOX-loaded nanoparticles, free DOX and DCM control for 48 h at identical DOX and DCM concentrations, respectively. Values reported are mean \pm s. d. (n=3).

Table. S1. The R_2 values, T_2 SNR of empty PolyMags and the PolyMags@DOX (2 mg/mL).

Time (h)	PolyMags			PolyMags@DOX		
	R_2 (S^{-1})	R_2^* (S^{-1})	T_2 /SNR	R_2 (S^{-1})	R_2^* (S^{-1})	T_2 /SNR
0	11.0±0.4	15.4±1.0	51.8±2.5	11.0±0.7	15.3±0.9	53.2±2.1
2	18.2±1.1	25.6±2.7	27.2±3.2	11.3 ±0.6	26.1±2.1	51.2±3.7
6	18.7±1.0	27.7±2.7	23.3±2.7	18.4±1.3	28.1±2.4	24.1±3.1
18	21.8±1.0	28.8±3.1	20.0±3.1	21.2 ±1.0	29.0±2.4	21.1±2.0

R_2 and T_2 SNR of tumors were measured before and after injection of empty PolyMags and the PolyMags@DOX (2 mg/mL) (time points: 0, 2, 6, 18 h; n=3) via tail vein (100 μ L/mL, 300 μ L). The mean T2WI signal intensities was measured for each tumor (S_{mean}).



Figure. S8. Images of mice and tumors collected from all groups after various treatments and light irradiation. Note: (1) PolyMags@DOX + L, (2) PolyMags@DOX, (3) PolyMags + L, (4) DOX, (5) PolyMags, (6) DCM + L, (7) PBS.