

Fig. S1 A TEM image of Pd-Fe.

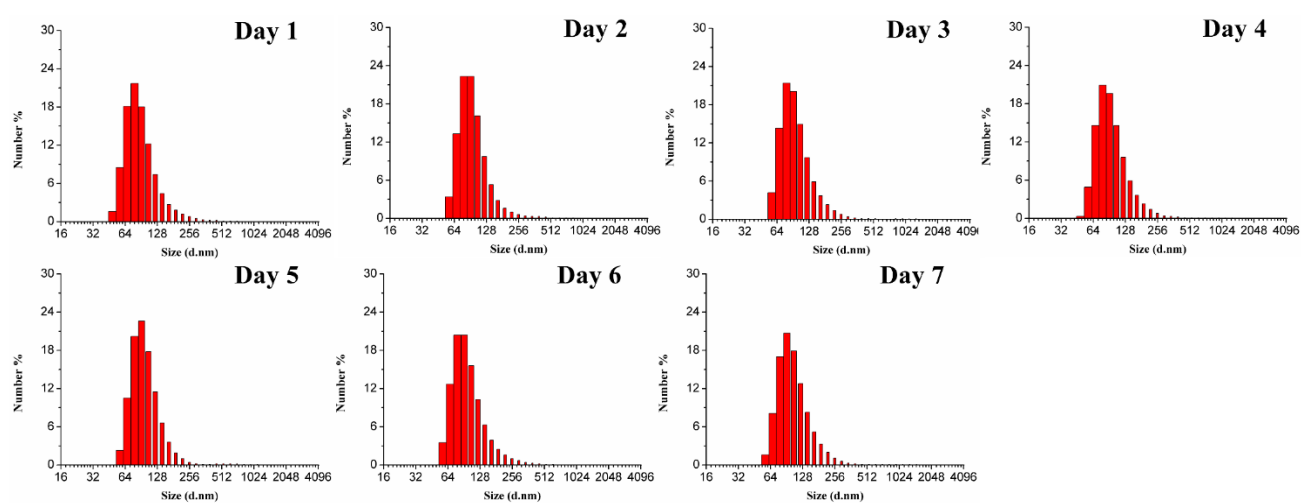


Fig. S2 Stability of HSA-Pd-Fe-Ce6 NAs in DI water.

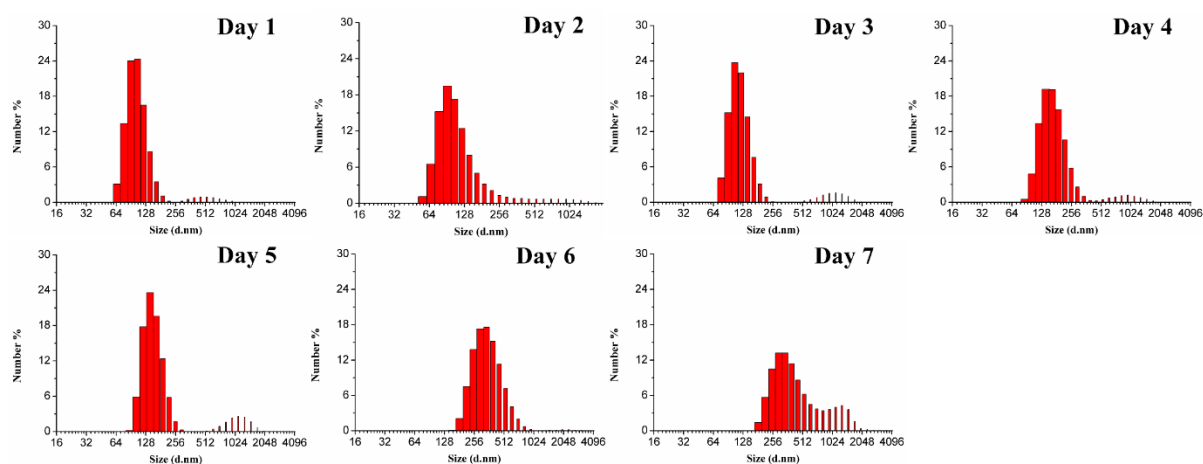


Fig. S3 Stability of HSA-Ce6 NAs in DI water.

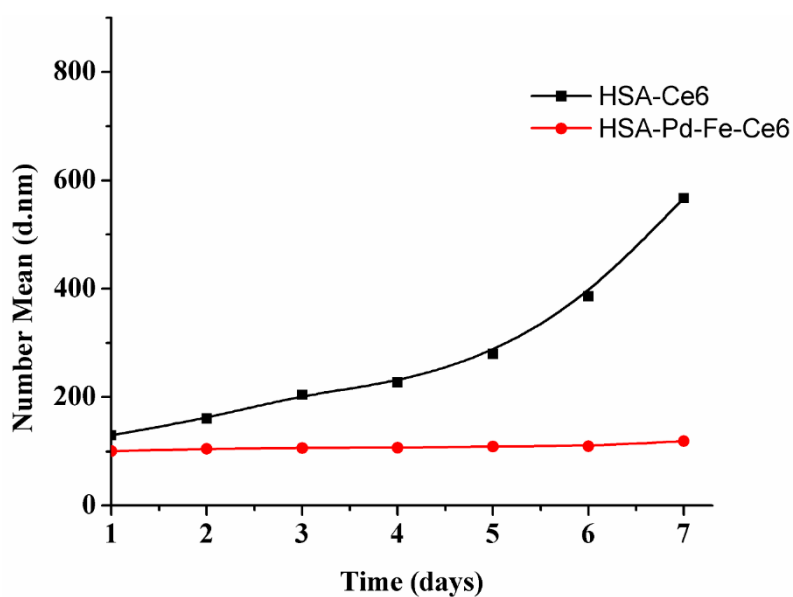


Fig. S4 size change curve of **S2** and **S3**.

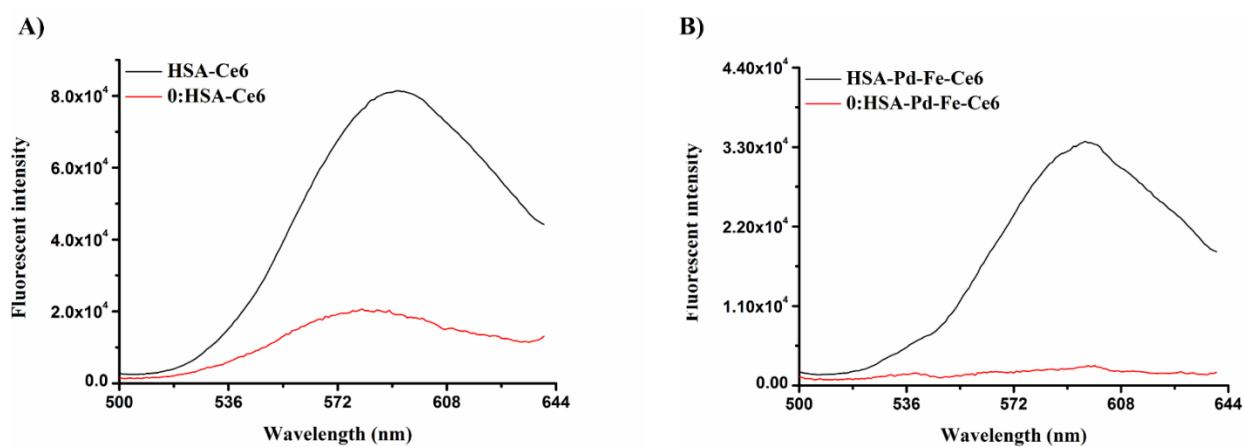


Fig. S5 The fluorescence intensity of dihydroethidium (DHE) of **A)** HSA-Ce6 NPs and **B)** HSA-Pd-Fe-Ce6 NAs after mixed with H₂O₂ (100 μ M), DNA (1 mg/ml) and DHE (4 mg/ml) in PBS (pH 5.5). 0: refers to the fluorescence intensity before mixed with DHE.

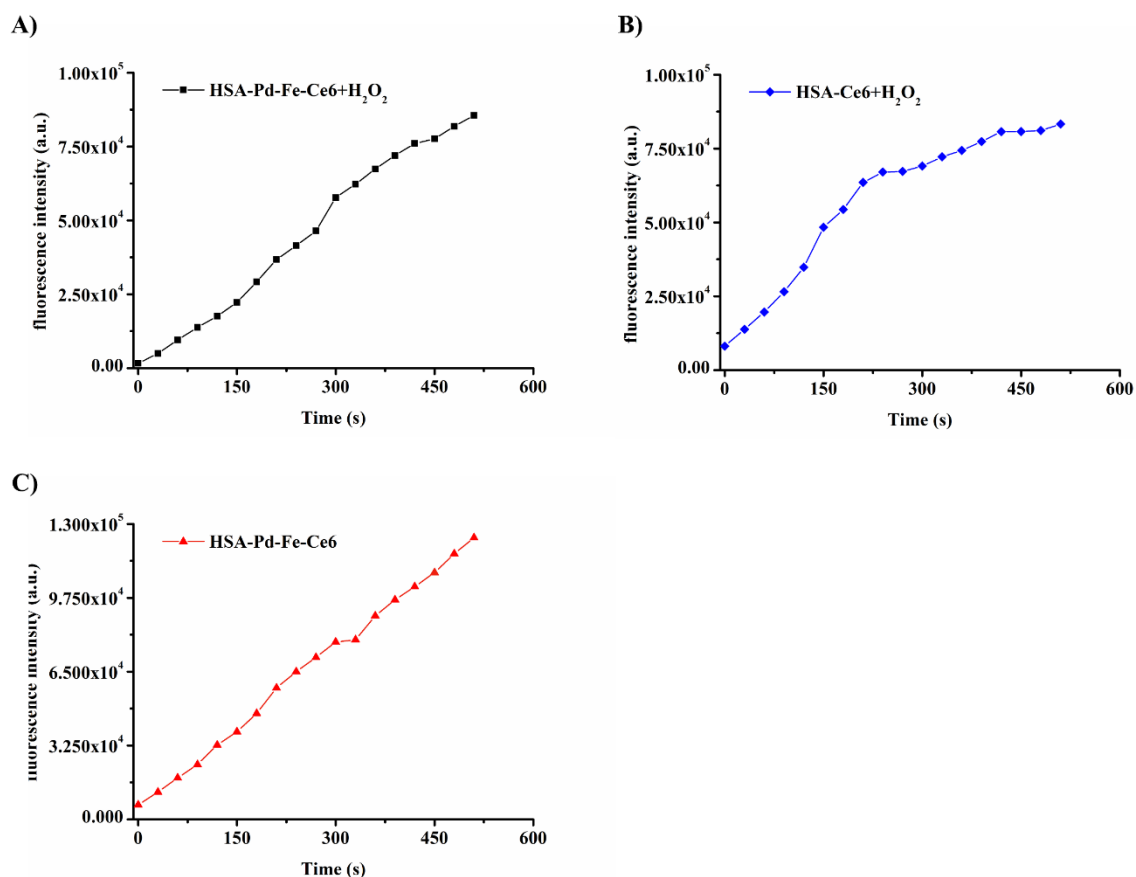


Fig. S6 The fluorescence intensity of 2',7'-dichlorofluorescein diacetate (DCFH-DA) **A)** group HSA-Pd-Fe-Ce6 +H₂O₂, **B)** group HSA-Pd-Fe-Ce6 and **C)** group HSA-Ce6+H₂O₂ NPs under 660 nm laser (0.5 w/cm², 30 s) irradiation per 30 s.

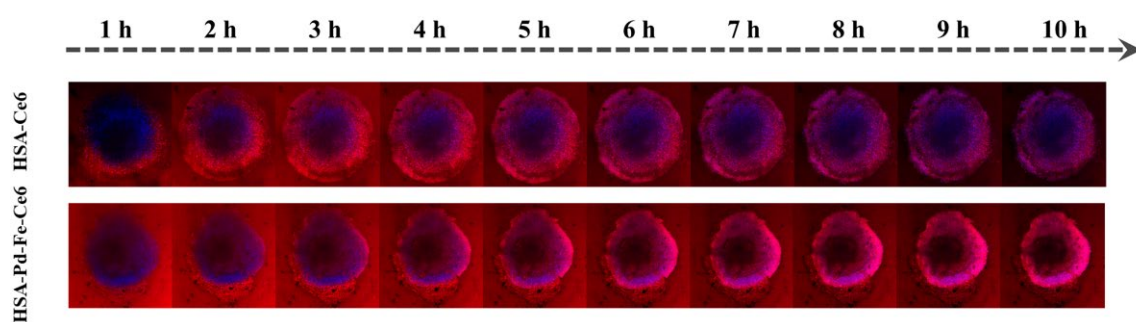


Fig. S7 Images of the 3D spheroids of MCF-7 cells incubated with HSA-Pd-Fe-Ce6 or HSA-Ce6 per hour.

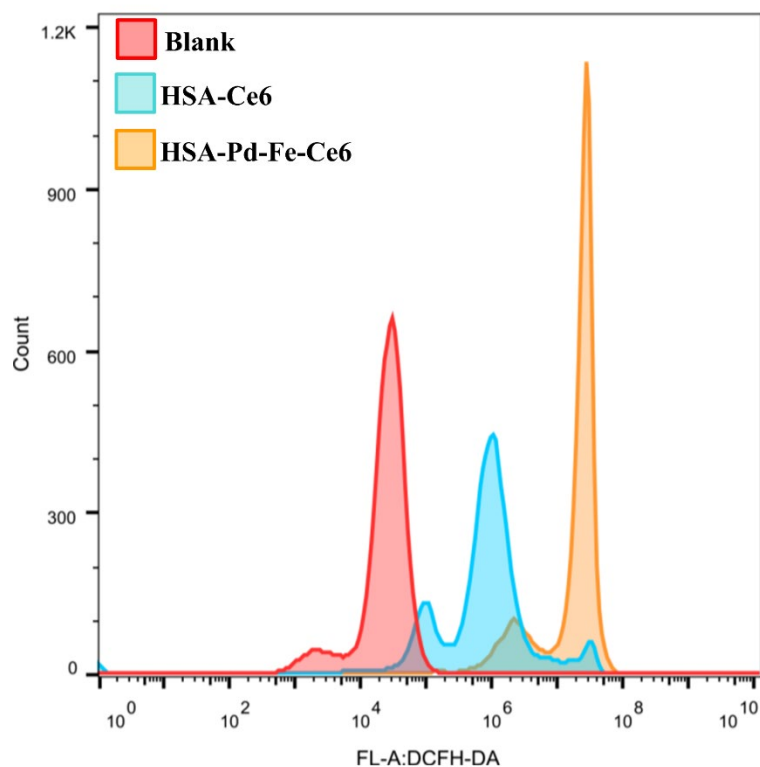


Fig. S8 The generation of ROS determined by the DCFH-DA fluorescence of MCF-7 cells after coincubated with PBS or HSA-Ce6 nanoparticles (20 $\mu\text{g/ml}$) or HSA-Pd-Fe-Ce6 NAs (20 $\mu\text{g/ml}$) with H_2O_2 (50 μM) for 2 h and further 20 minutes laser irradiation.(660 nm,0.5 w/cm^2).

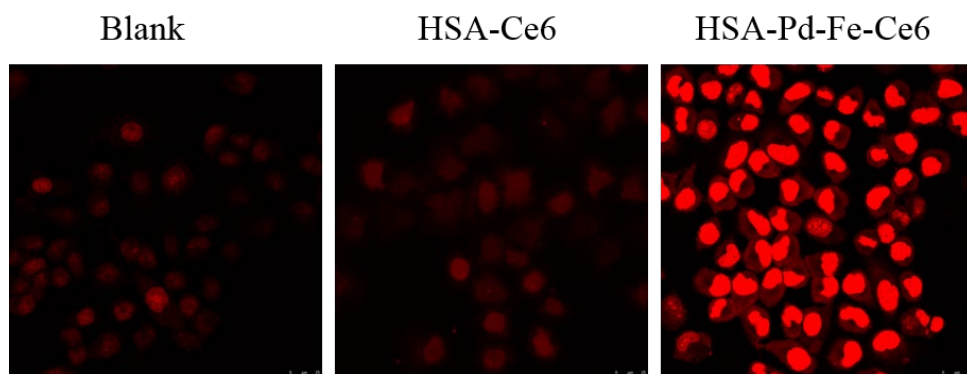


Fig. S9 Use of a free radical indicator to evaluate the production of ROS ($\cdot\text{OH}$, $\cdot\text{O}_2^-$) after incubation of MCF-7 cells with dihydroethidium and H_2O_2 (50 μM).

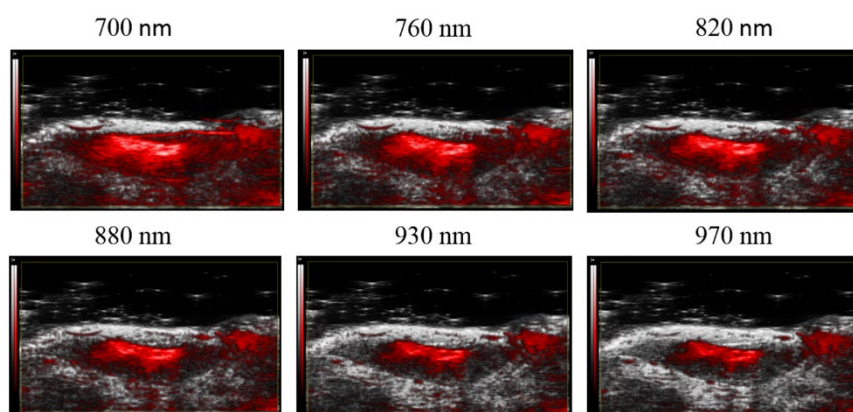


Fig. S10 Photoacoustic signals of HSA-Pd-Fe-Ce6 nanoparticles at 700 nm, 760 nm, 820 nm, 880 nm, 930 nm and 970 nm.