

Supporting Information

Y₁ receptor ligand functionalized ultrasmall upconversion nanoparticles for tumor-targeted trimodality imaging and photodynamic therapy with low toxicity

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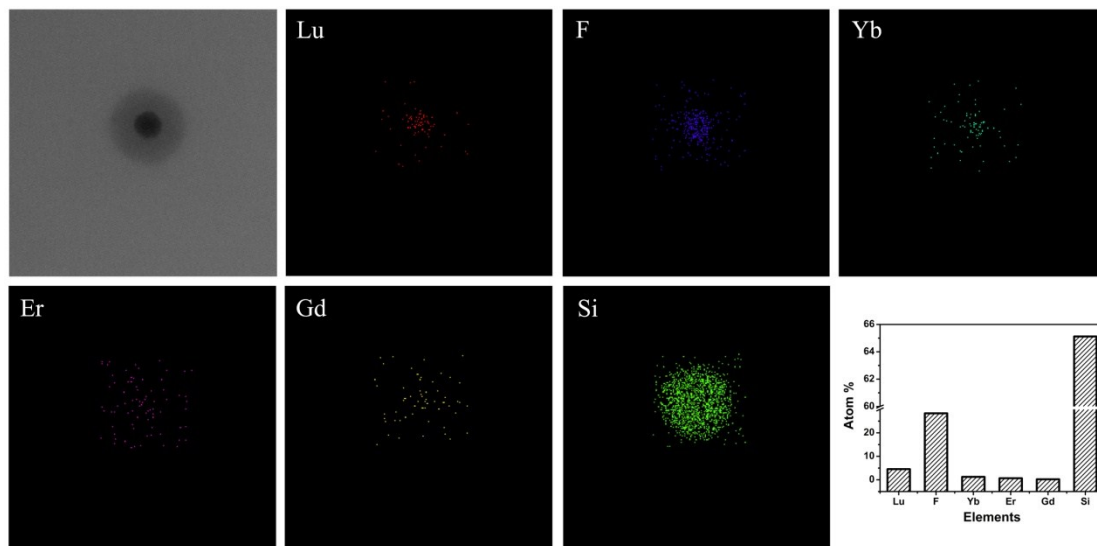


Fig. S1. EDS elemental mapping of Lu, F, Yb, Er, Gd, and Si in MNPs nanocomposites.

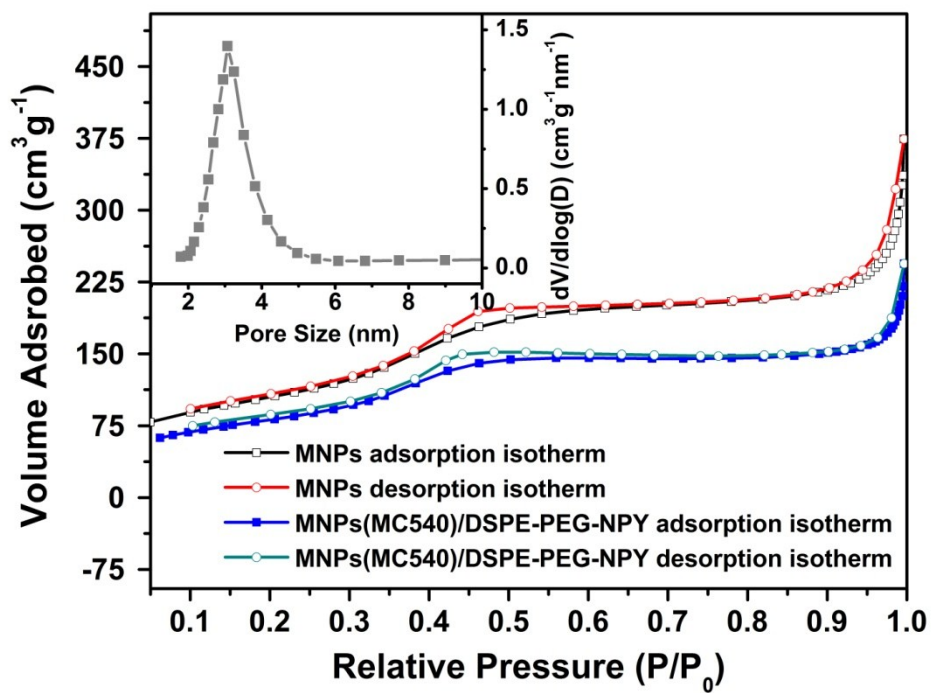


Fig. S2 N₂ adsorption-desorption isotherm and corresponding pore-size distributions of MNPs and MNPs(MC540)/DSPE-PEG-NPY nanocomposites.

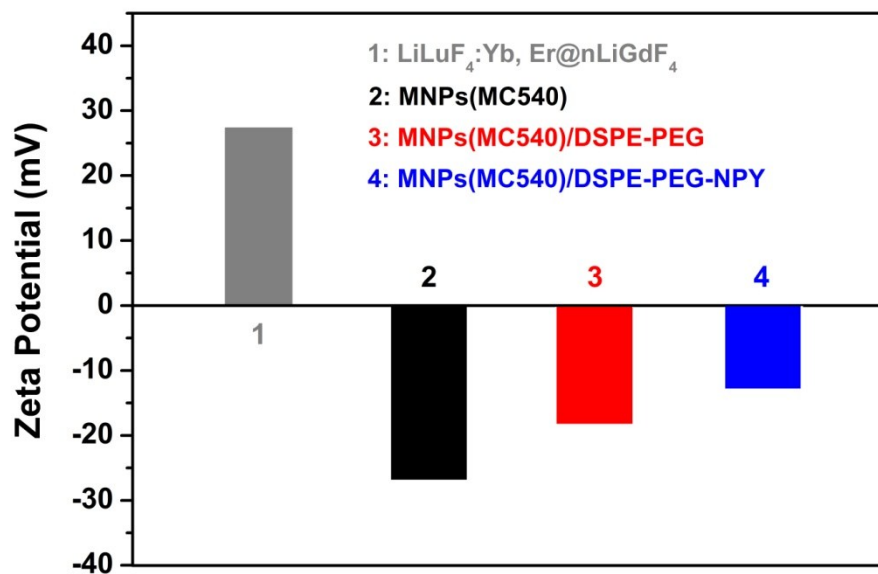


Fig. S3 Zeta Potential of $\text{LiLuF}_4:\text{Yb,Er}@n\text{LiGdF}_4$, $\text{MNPs}(\text{MC540})$, $\text{MNPs}(\text{MC540})/\text{DSPE-PEG}$ and $\text{MNPs}(\text{MC540})/\text{DSPE-PEG-NPY}$ nanocomposites.

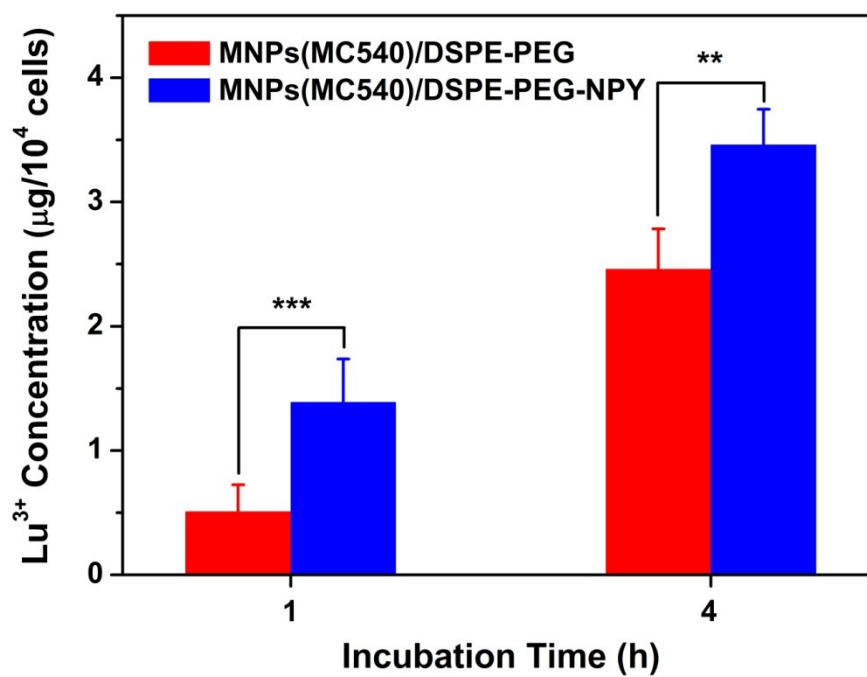


Fig. S4 Quantification of the cellular uptake of MNPs(MC540)/DSPE-PEG and MNPs(MC540)/DSPE-PEG-NPY by ICP-MS with the incubation time of 1 or 4 h. ** indicates $p < 0.01$ while *** indicates $p < 0.001$.

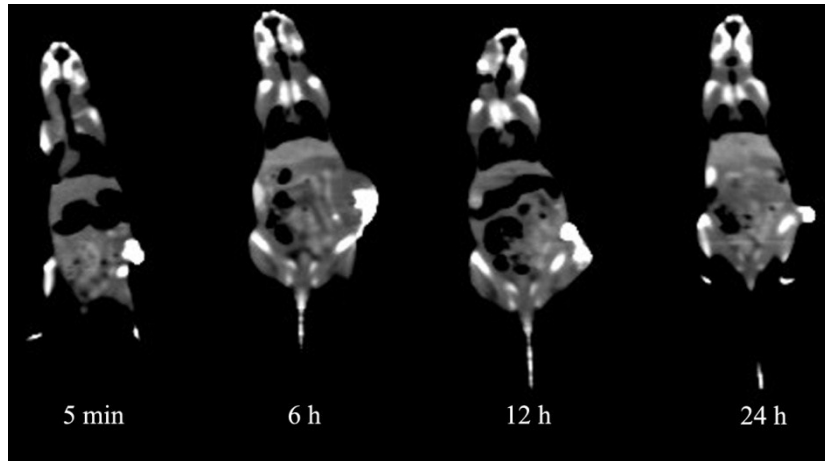


Fig. S5 *In vivo* coronal CT images of MNPs(MC540)/DSPE-PEG-NPY nanocomposites with a dose of 10 mg/kg in MCF-7 tumor bearing mice at different time points post intratumoral injection.

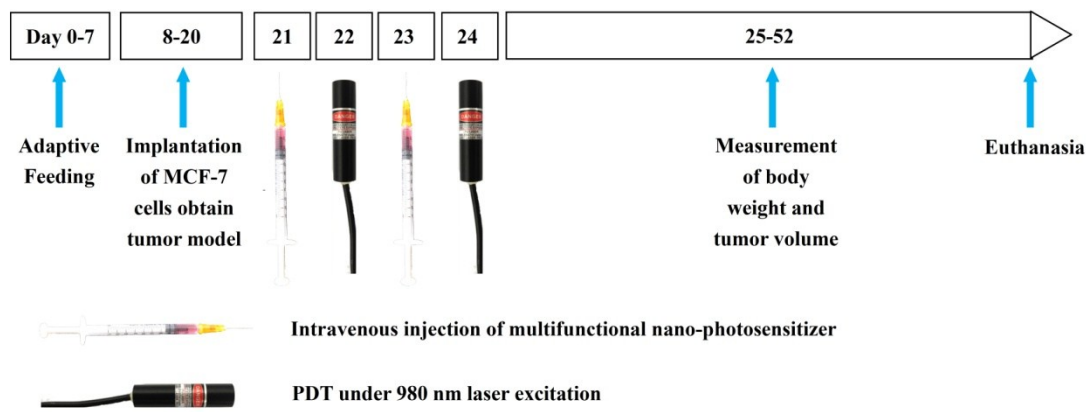


Fig. S6 The process of PDT treatment for MCF-7 tumor bearing mice.

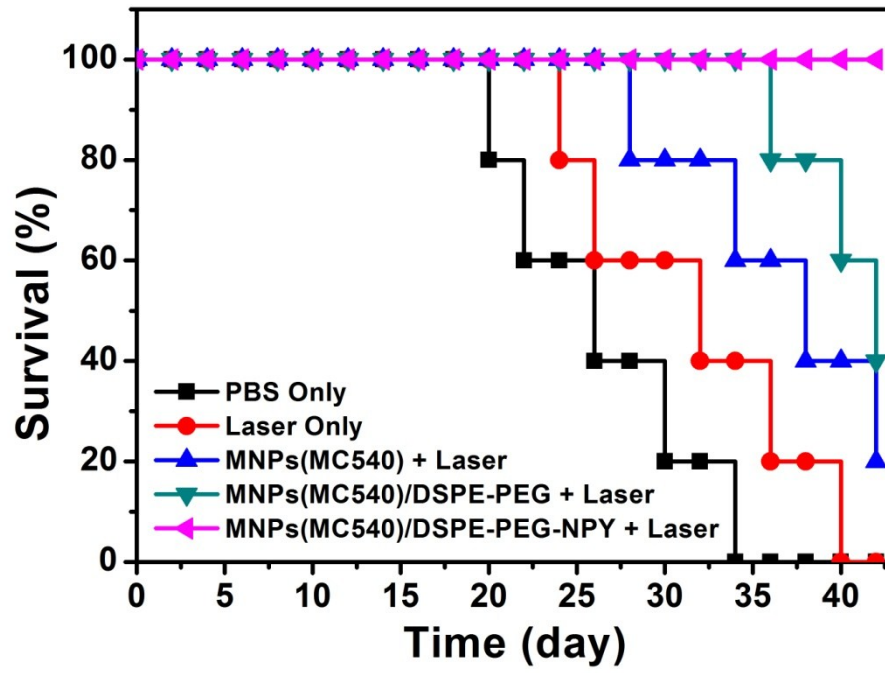


Fig. S7 Survival curves of the MCF-7 cells bearing nude mice after different treatments.

Table S1 The UF intensity of green and red band and the G/R ratio of different nanocomposites

Nanoparticles	Green Band (500-575 nm)	Red Band (630-690 nm)	G/R ratio
LiLuF₄:Yb,Er	1.40*10 ⁶	0.44 *10 ⁶	3.18
LiLuF₄:Yb,Er@LiGdF₄	7.66 *10 ⁶	2.38 *10 ⁶	3.22
MNPs	4.52 *10 ⁶	1.58 *10 ⁶	2.86
MNPs(MC540)	2.50 *10 ⁶	1.88 *10 ⁶	1.33
MNPs(MC540)/DSPE-PEG	2.08 *10 ⁶	1.51*10 ⁶	1.38
MNPs(MC540)/DSPE-PEG-NPY	1.98 *10 ⁶	1.35 *10 ⁶	1.47