

Fig. S1 Size distribution of (a) DSSCe6 NPs and Fe<sub>3</sub>O<sub>4</sub> NPs measured by DLS.



Fig. S2. TEM-EDX line-profile analysis of DSSCe6@Fe<sub>3</sub>O<sub>4</sub> NPs.



Fig. S3. NIR fluorescence image of DSSCe6@Fe<sub>3</sub>O<sub>4</sub> NPs incubated with DMEM and MCF-7 cells at 1h, 2h and 3h.



**Fig. S4.** Magnetization loop of DSSCe6@Fe<sub>3</sub>O<sub>4</sub> NPs normalized to per gram of powder (H: Applied magnetic field; M: Magnetization). Inset: photograph of the DSSCe6@Fe<sub>3</sub>O<sub>4</sub> NPs dispersed in water with a magnet after 24 h.



**Fig. S5.** Phototoxicity of free Ce6, DSSCe6, DSSCe6@Fe<sub>3</sub>O<sub>4</sub>NPs(MF-) and DSSCe6@Fe<sub>3</sub>O<sub>4</sub> NPs under an external magnetic field(MF+) detected by fluorescence microscopy using fluorescent probes (double-staining with PI and Calcein-AM) without an NIR laser (660 nm). Dead cells: red fluorescence of PI; live cells: green fluorescence of Calcein-AM.