Supporting Information

Near-infrared light-regulated cancer theranostic nanoplatform based on aggregation-induced emission luminogen encapsulated upconversion nanoparticles

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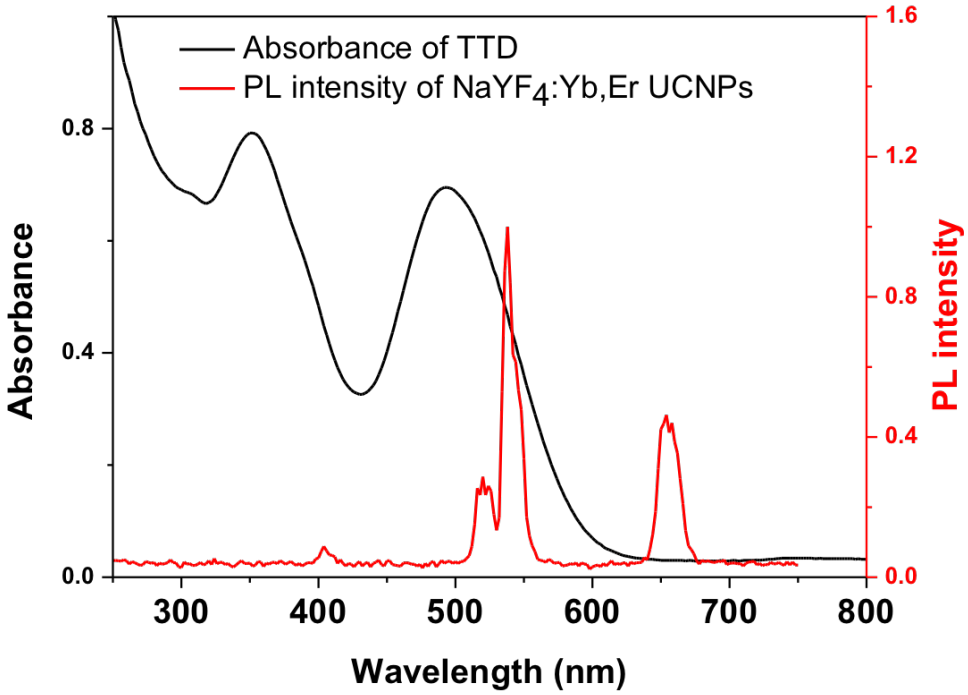

Figure S1. The close match between the emission of $NaYF_4$:Yb,Er UCNPs and absorption of the AIEgen PS TTD.

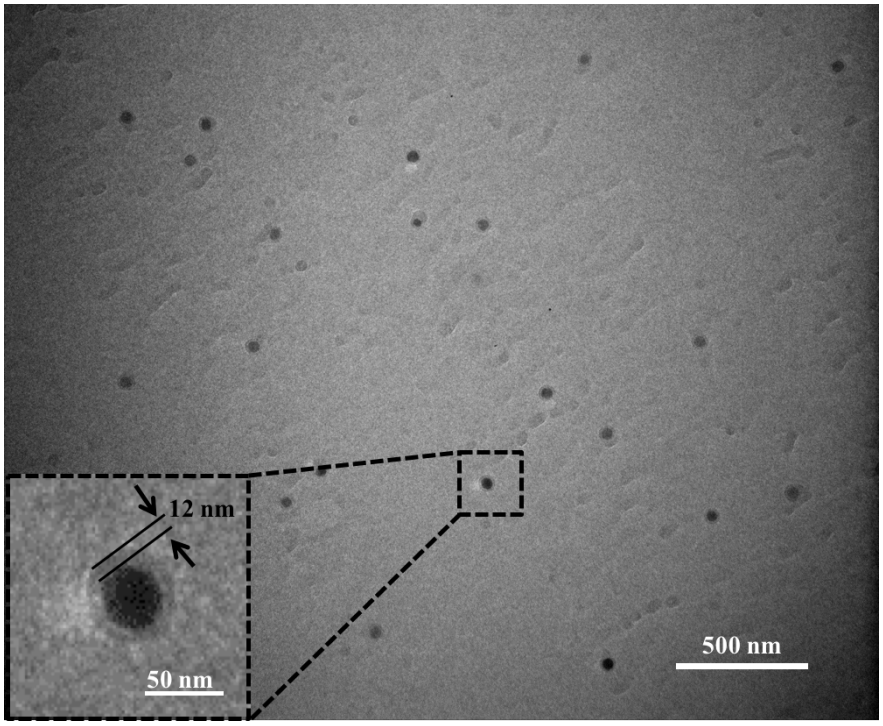

Figure S2. The morphology of UCNP@TTD-cRGD NPs under transmission electron microscopy. The thickness of shealth was measured to be around 12 nm, which is within the active range (<20 nm) of ROS.

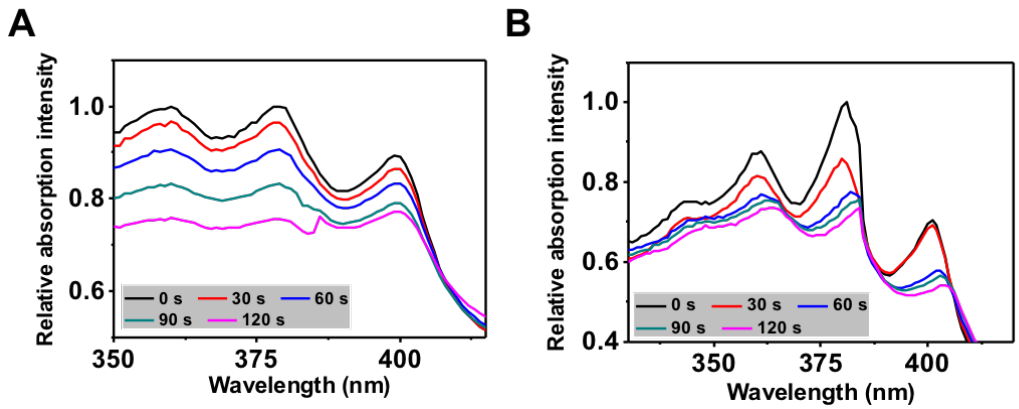

Figure S3. **Releative $^1O_2$ generation of UCNP@TTD-cRGD NPs**. The UCNP@TTD-cRGD NPs was illuminated by a **980 nm laser** (**A**) or a **white light** (**B**) at different time intervals, respectively. The $^1O_2$ generation of UCNP@TTD-cRGD NPs was revealed by the decreased absorbance of ABDA at 378 nm.

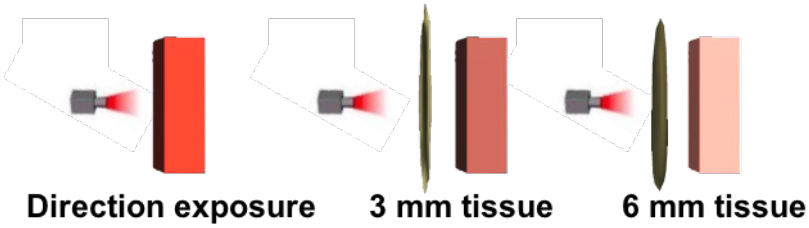

Figure S4. The schemetic illustration of ROS generation study of UCNP@TTD-cRGD NPs covered with a 3-mm and 6-mm thick chicken tissue, resepctively.

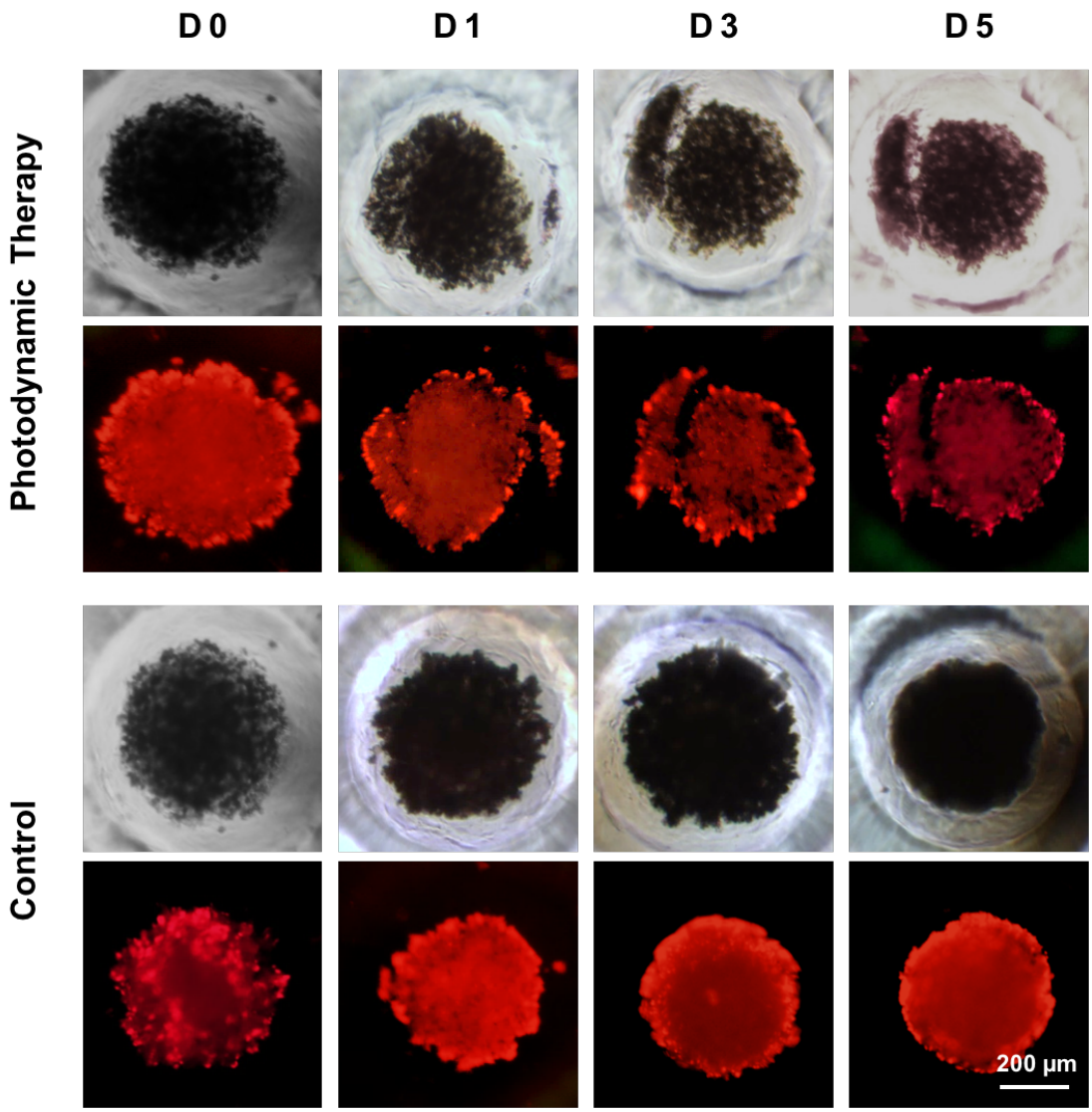

Figure S5. The bright field images and confocal images of of 3D cell spheroids stained with F-actin staining after NIR light-regulated PDT teamment or with only NIR light illumination respectively.

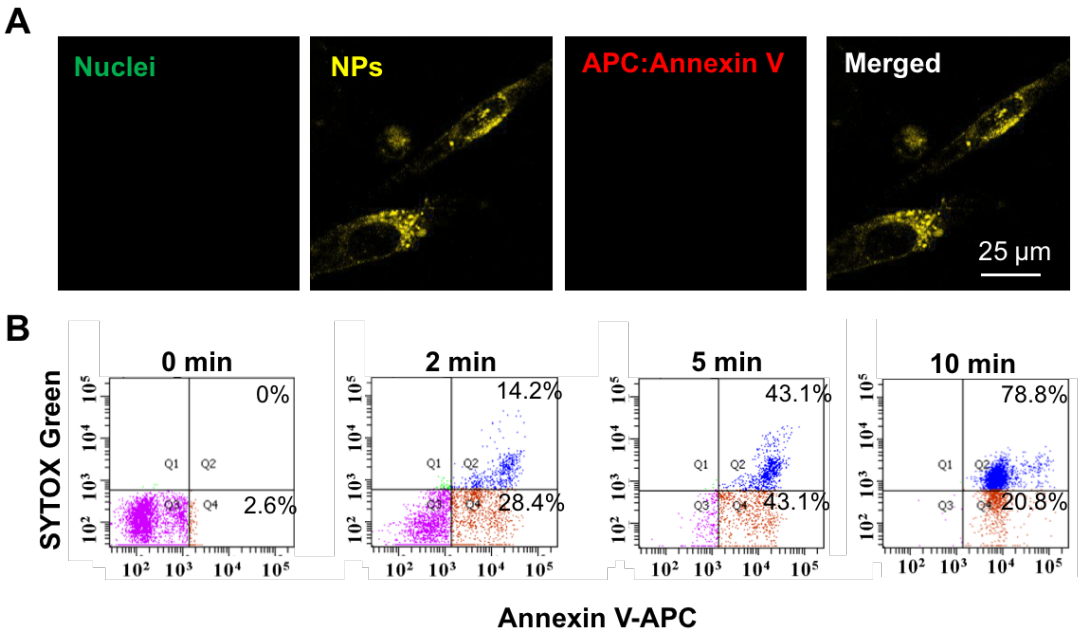

Figure S6. Apoptosis and necrosis staining of MDA-MB-231 cells after PDT treatment based on UCNP@TTD-cRGD NPs. (**A**) Confocal images of MDA-MB-231 cells treated with UCNP@TTD-cRGD NPs (5 μg mL^{-1} of TTD) only. (**B**) Flow cytometry results of MDA-MB-231 cells after co-culture with UCNP@TTD-cRGD NPs (5 μg mL^{-1} of TTD) for 4 h at 37 °C and then exposed to 0, 2, 5, and 10 min of 980 nm laser illumination (100 mW cm^{-2}), following by further incubation for 24 hours, respectively. Then, the apoptosis/necrosis was accessed with APC Annexin V/Dead Cell Apoptosis Kit staining by flow cytometry.

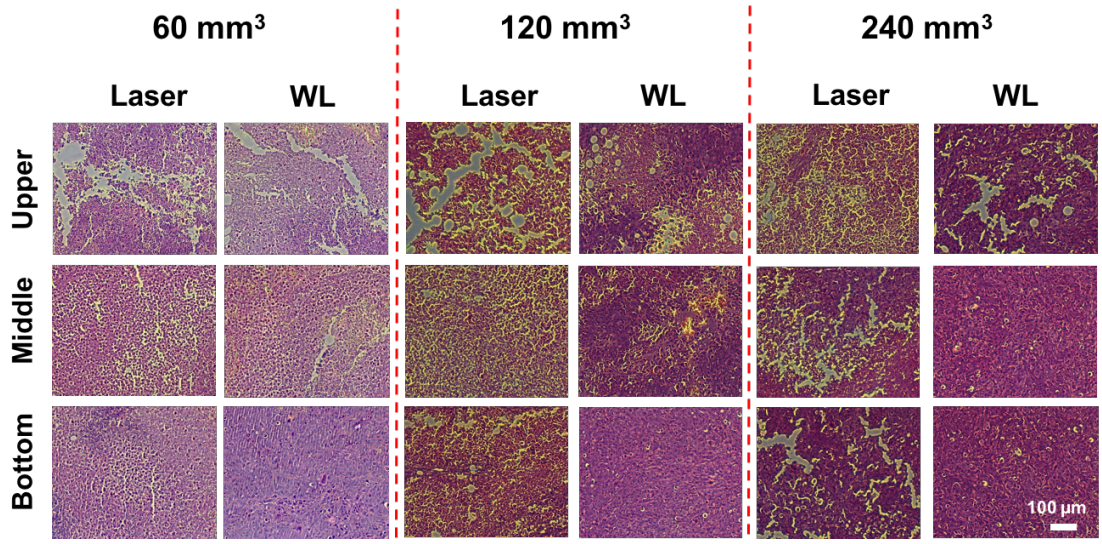

Figure S7. H&E staining results of tumor slices collected from mice that were devided by their initial tumor volume of 60, 120 and 240 mm^3, respectively.

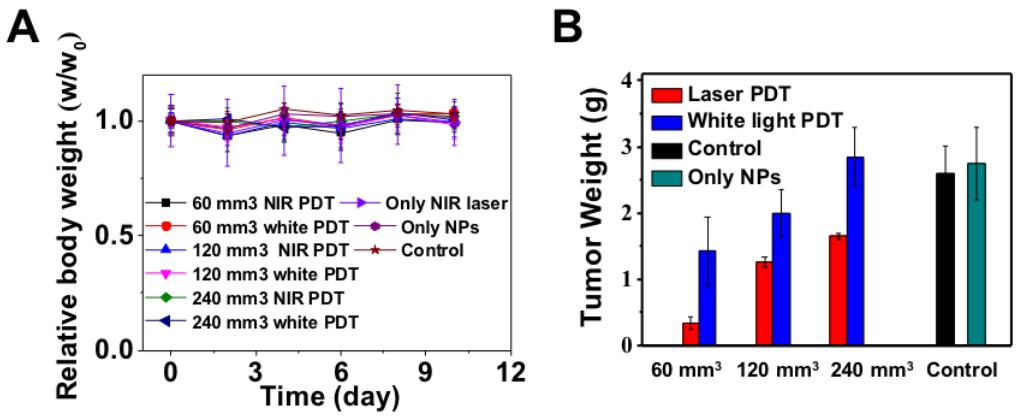

Figure S8. (**A**) The weight ratio of mice from each group for 10 days. (**B**) Tumor weight from each group after 10 days' PDT treatment.

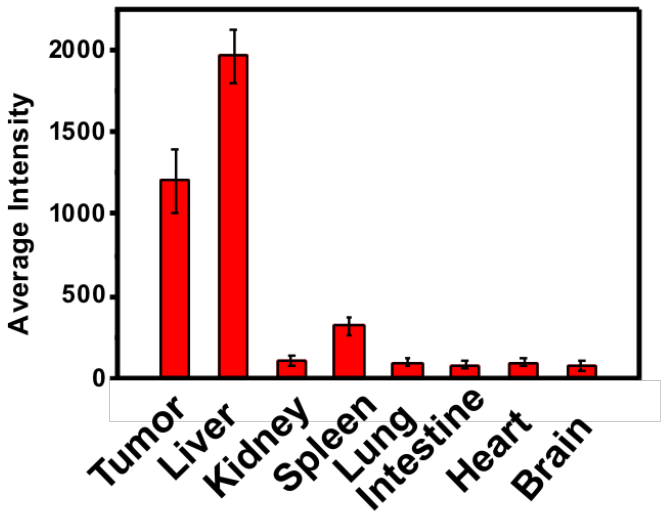

Figure S9. Quantitative analysis of biodistribution of UCNP@TTD-cRGD NPs in tumor-bearing mice showed in **Figure 9B**.

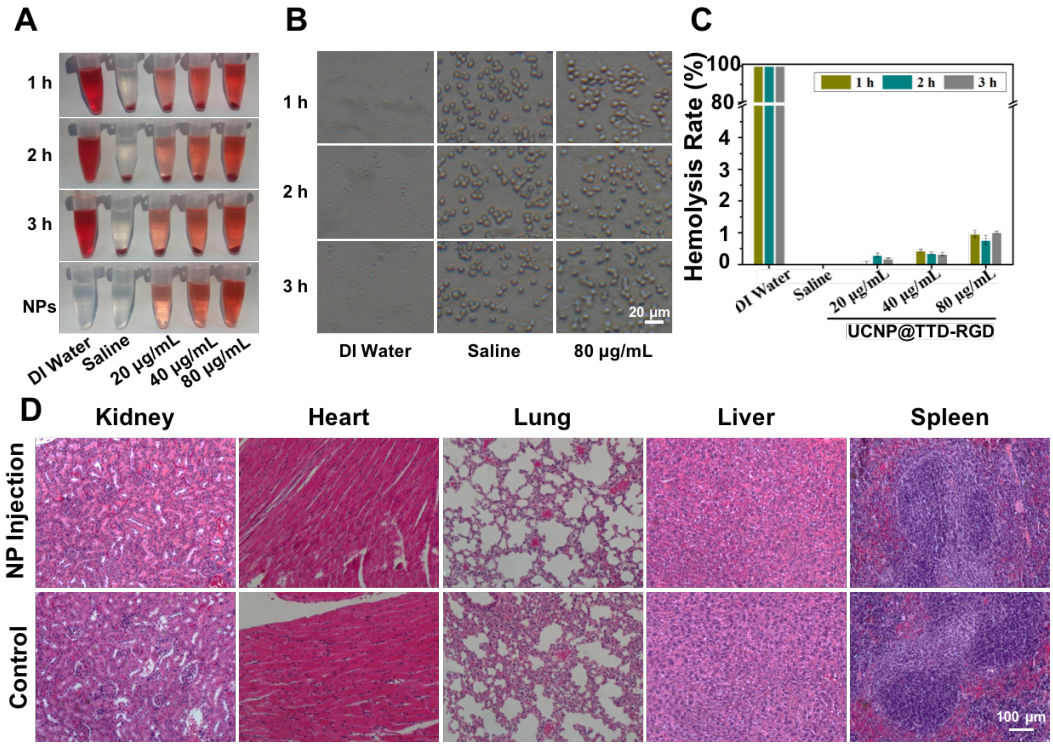

Figure S10. The *in vivo* toxicity of UCNP@TTD-cRGD NPs. (A) Photographs of hemolysis assay after incubation with distilled water, saline, UCNP@TTD-cRGD NPs (20, 40 and 80 μg/mL) for 1, 2, and 3 h, respectively and only UCNP@TTD-cRGD NPs with the same concentration were used as control. (B) Optical microscopic observation of the dispersion states of the erythrocytes after incubation with distilled water, saline, and UCNP@TTD-cRGD NPs for 1, 2, and 3 h. Scale bars: 20 μm. (C) Hemolysis rate of each group. Data represent mean ± SD (n = 3). (D) Images of various H&E stained organ slices from mice with or without nanoparticle injection after 5 days. Scale bars: 100 μm.