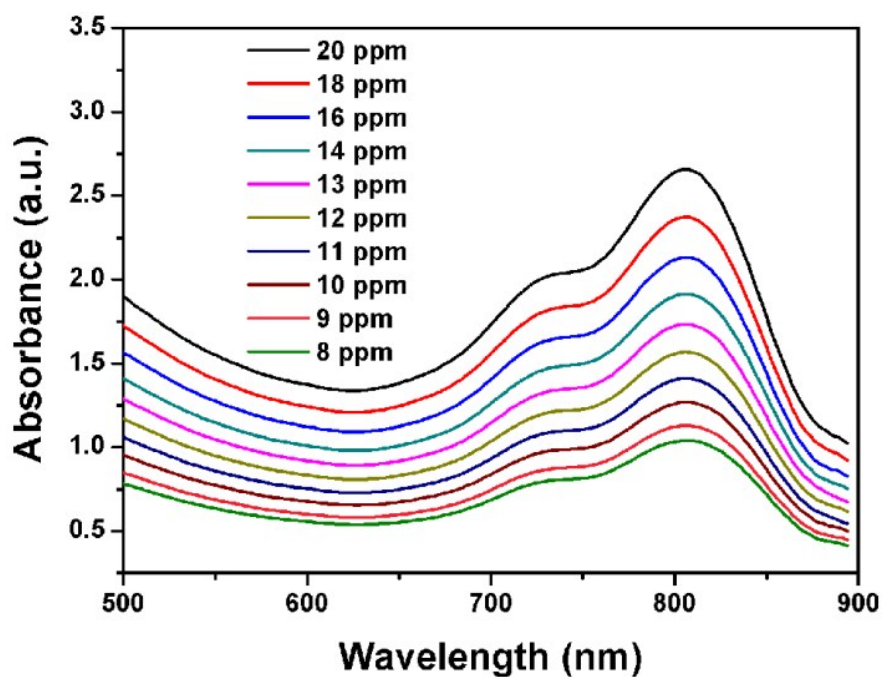


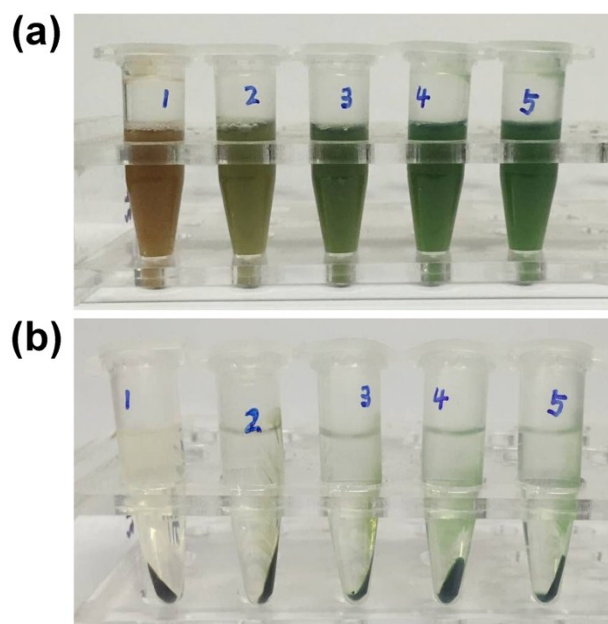
## Supporting Information

### Multifunctional UCNPs@PDA-ICG Nanocomposites for Upconversion Imaging and Combined Photothermal/Photodynamic Therapy with Enhanced Antitumor Efficacy

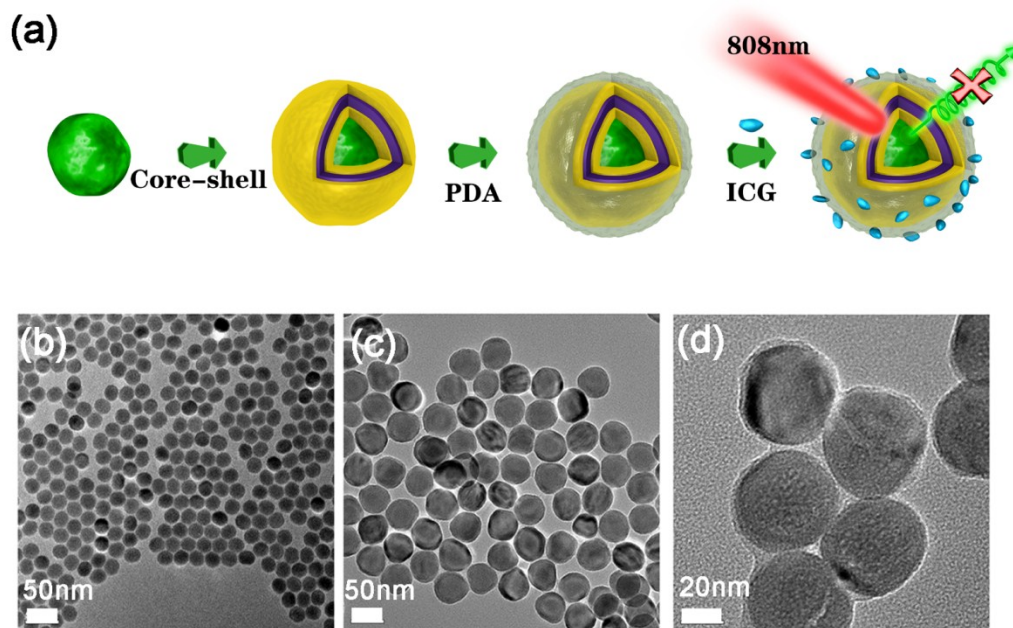
Bei Liu, Chunxia Li,\* Bengang Xing, Piaoping Yang and Jun Lin\*



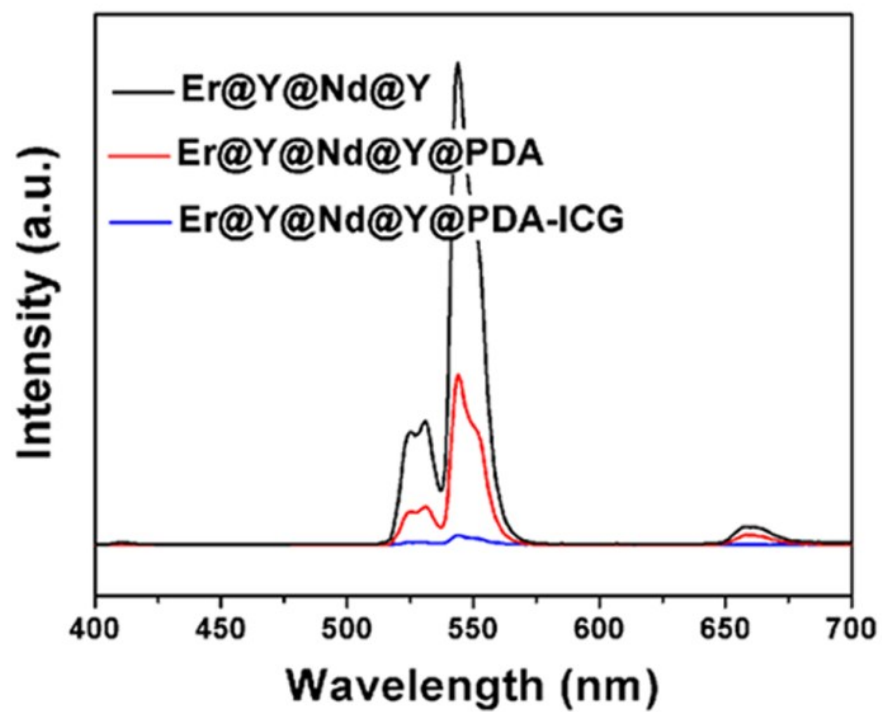
**Figure S1.** The UV-vis-NIR absorption spectra of UPI nanocomposites with different ICG concentrations.



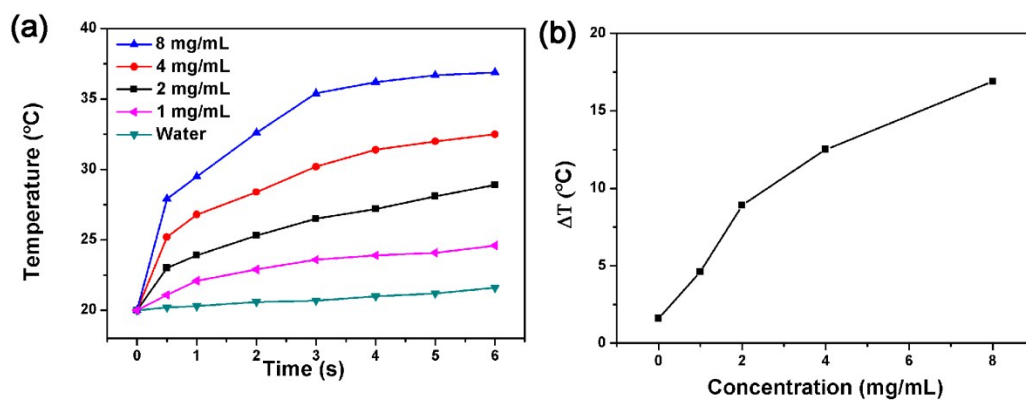
**Figure S2.** Photographs of UCNPs@PDA-ICG solutions before (a) and after (b) centrifugation with different amount of ICG loading (1: 5  $\mu\text{g}$ ; 2: 50  $\mu\text{g}$ ; 3: 100  $\mu\text{g}$ ; 4: 200  $\mu\text{g}$ ; and 5: 400  $\mu\text{g}$ ) on the surface of UCNPs@PDA (800  $\mu\text{g}/\text{mL}$ ).



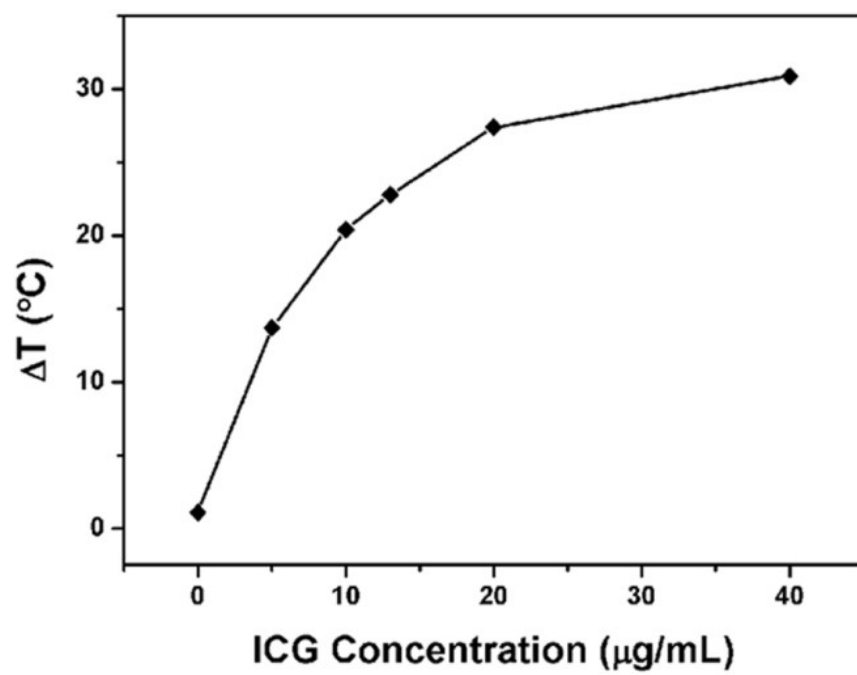
**Figure S3.** Schematic illustration for the synthetic procedure of NaYF<sub>4</sub>:Yb, Er@NaYF<sub>4</sub>:Yb@NaNdF<sub>4</sub>:Yb@NaYF<sub>4</sub>@PDA-ICG (labeled as Er@Y@Nd@Y@PDA-ICG) nanocomposites. TEM images of NaYF<sub>4</sub>:Yb, Er (b), Er@Y@Nd@Y (c) and Er@Y@Nd@Y@PDA (d).



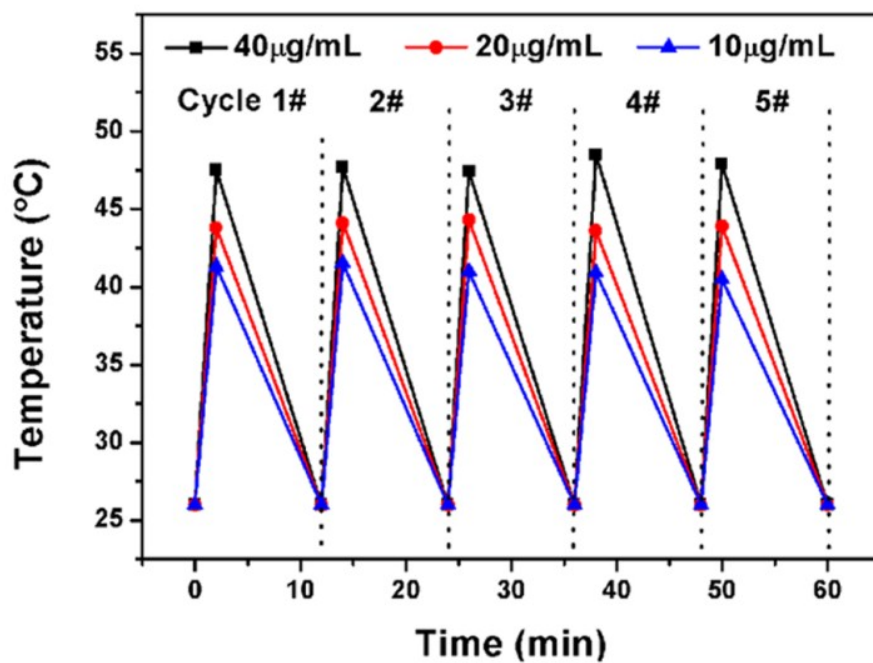
**Figure S4.** Upconversion emission spectra of Er@Y@Nd@Y, Er@Y@Nd@Y@PDA and Er@Y@Nd@Y@PDA-ICG respectively under 808 nm laser excitation.



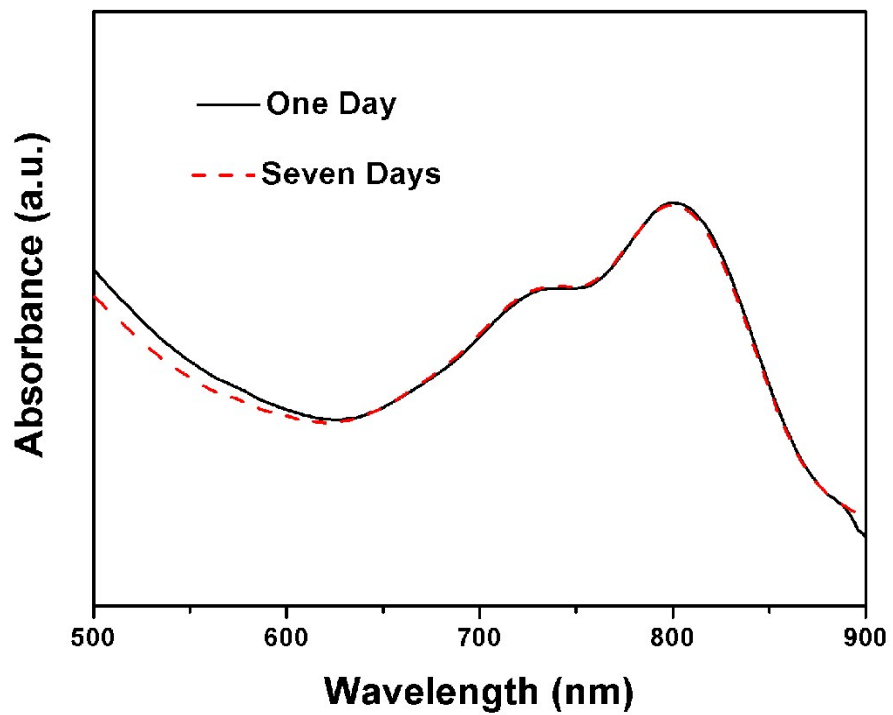
**Figure S5.** (a) Temperature variation curves of the aqueous dispersions containing different concentrations of UCNPs@PDA aqueous solutions under the irradiation of 808 nm with a power density of  $0.66 \text{ W cm}^{-2}$ . (b) Plot of temperature elevation over a period of 360 s versus the concentration of UCNPs@PDA nanocomposites.



**Figure S6.** Plot of temperature elevation over a period of 300 s versus the concentrations of ICG under the irradiation of 808 nm with a power density of  $0.66 \text{ W cm}^{-2}$ .

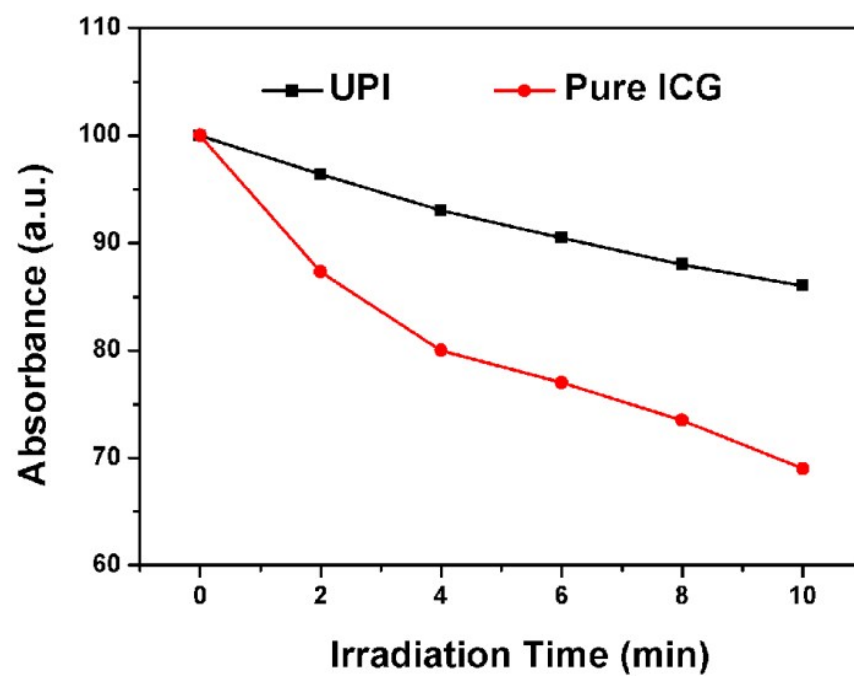


**Figure S7.** Temperature changes of UPI with different ICG concentrations over five ON/OFF cycles of 808 nm laser irradiation (2 min NIR irradiation followed by a 10 min cooling period).

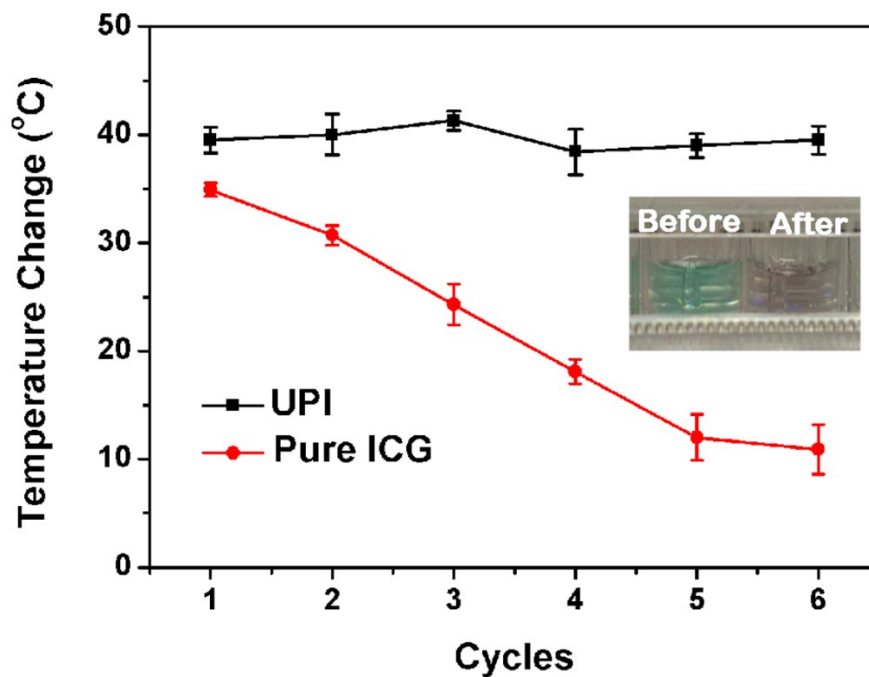


**Figure S8.** The UV-Vis-NIR absorption spectra of UPI nanocomposites before and after seven days' mild shaking.

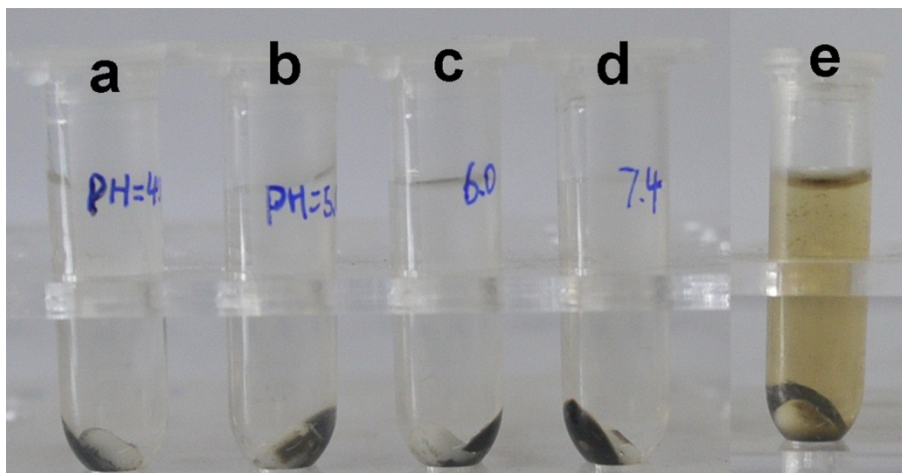




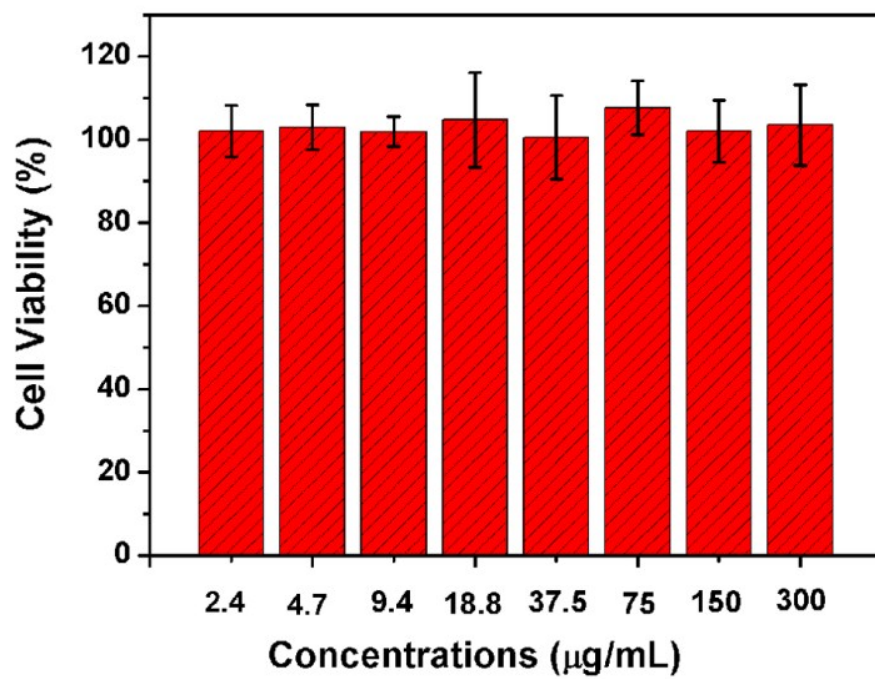
**Figure S9.** The absorption values of pure ICG and UPI at 808 nm after different irradiation times.



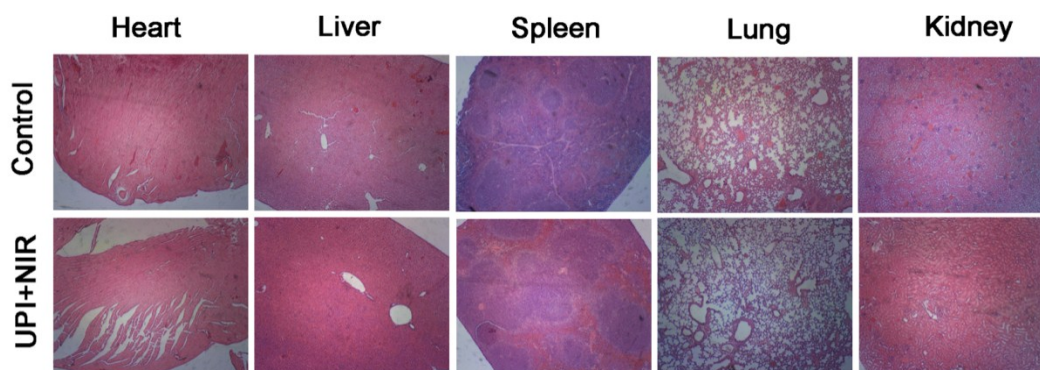
**Figure S10.** The temperature changes of UPI and Pure ICG aqueous solutions over six rounds of repeated irradiation using laser on/off cycling (5 min NIR irradiation followed by a 20 min cooling period). Insets are the photos of Pure ICG samples before and after six rounds of repeated NIR irradiation.



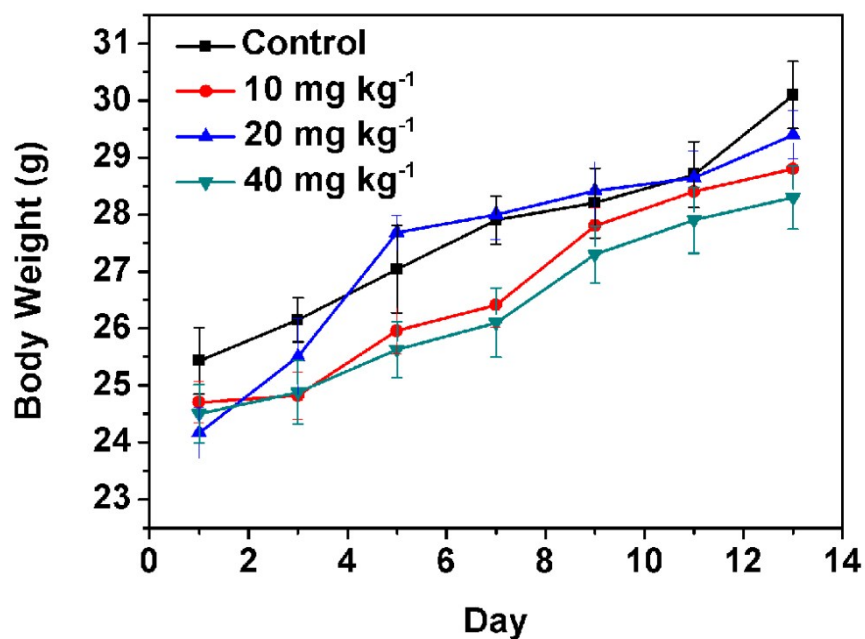
**Figure S11.** Photographs of UCNPs@PDA-ICG solutions after 24 hours stirring at 37°C and then centrifugation in different buffer conditions (a-d: PBS with different pH values. a: pH=4.0; b: pH=5.0; c: pH=6.0; d: pH=7.4; and e: serum).



**Figure S12.** In vitro cytotoxicity of UPI against L929 fibroblast cells after 24 h incubation.



**Figure S13.** Hematoxylin and Eosin (H&E) stained images of major organs for Control group and UPI+NIR group, respectively.



**Figure S14.** The body weight growth curves of the Kunming mice injected with different doses of UPI nanocomposites.