Supporting Information

Ultrasmall theranostic nanozymes to modulate tumor hypoxia for augmenting photodynamic therapy and radiotherapy

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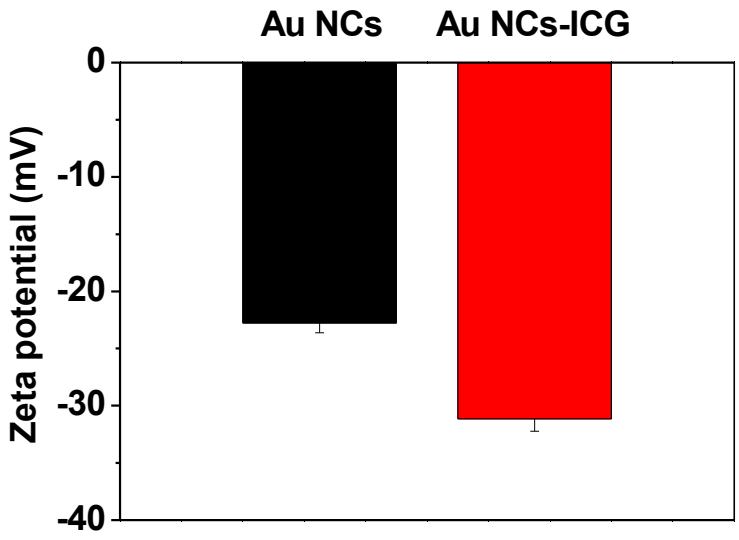

Fig. S1 Zeta potential of Au NCs and Au NCs-ICG.

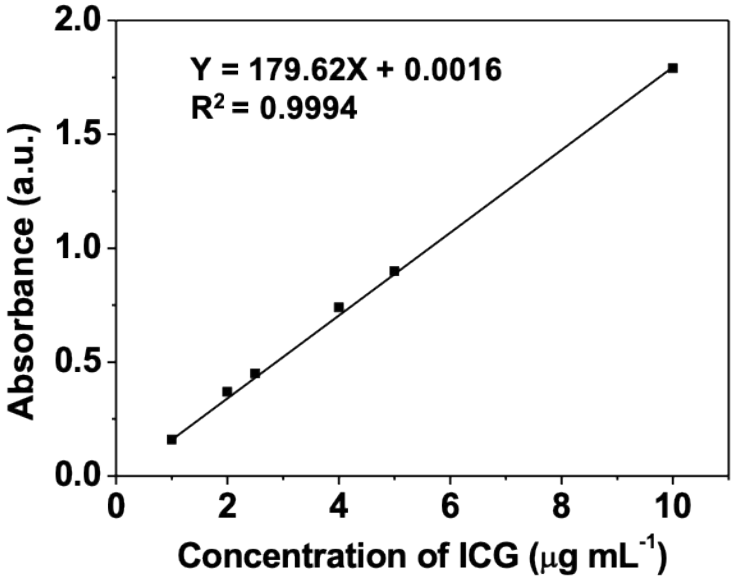

Fig. S2 The calibration curve of ICG obtained from the absorbance at 780 nm with different concentration of ICG solution.

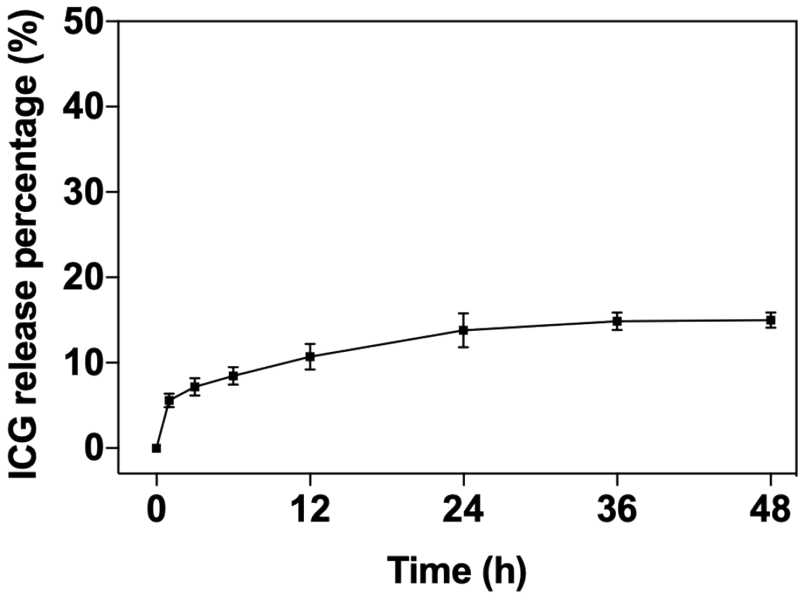

Fig. S3 *In vitro* Au NCs-ICG release profile in phosphate buffer (0.1 mM, pH 7.4).

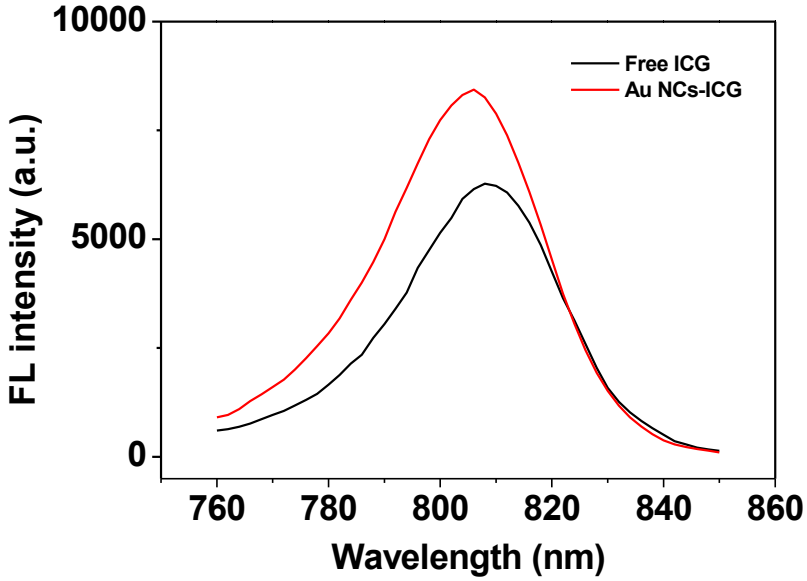

Fig. S4 FL emission spectra of free ICG and Au NCs-ICG (C_{ICG} = 10 μg mL^{-1}).

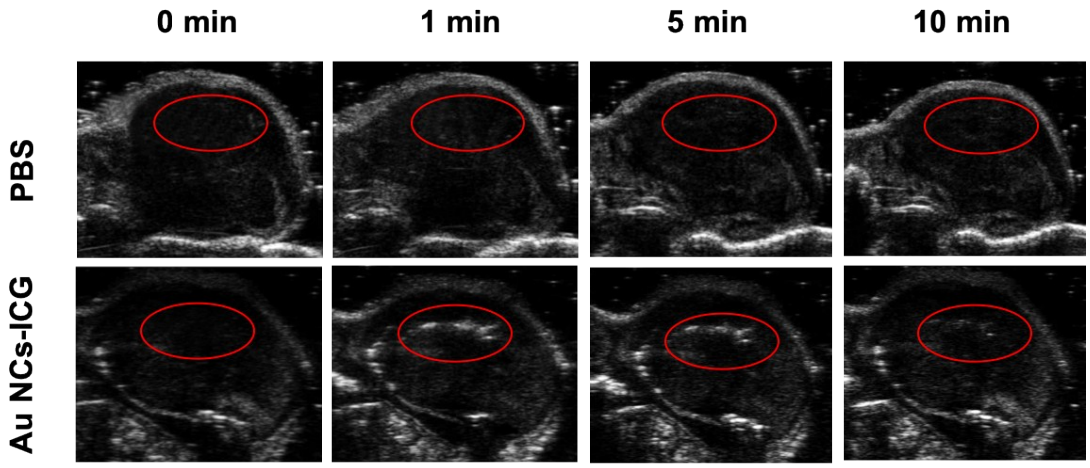

Fig. S5 Representative B-mode ultrasound images on tumor sites of 4T1 tumor-bearing mice post intratumoral injection of Au NCs-ICG.

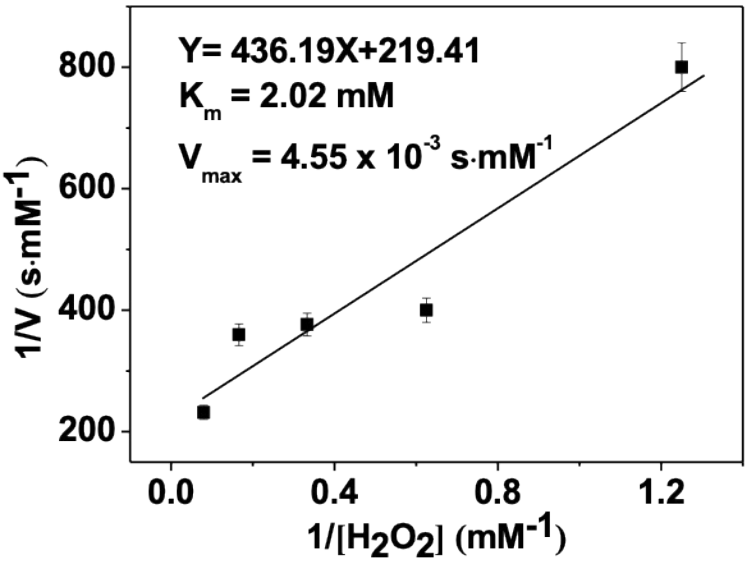

Fig. S6 Double-reciprocal plots of catalase-like activity of Au NCs-ICG which derived from the Michaelis-Menten equation.

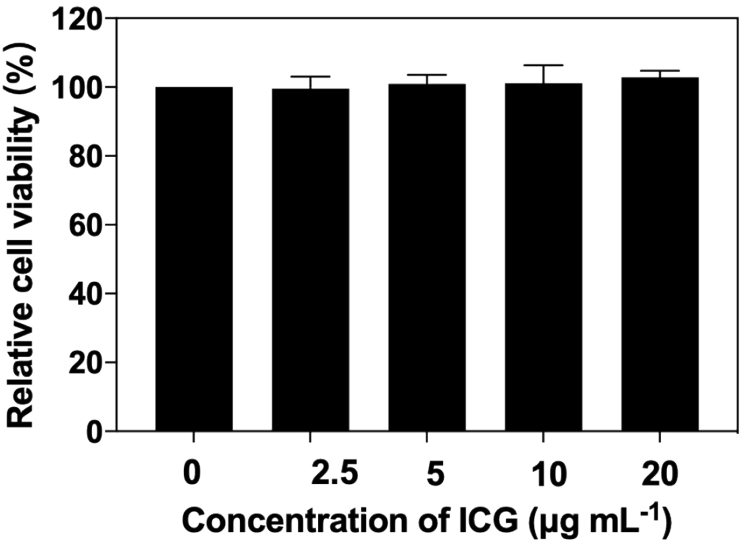

Fig. S7 Cell viability assay of 4T1 cells incubated with various concentrations of Au NCs-ICG for 24 h.

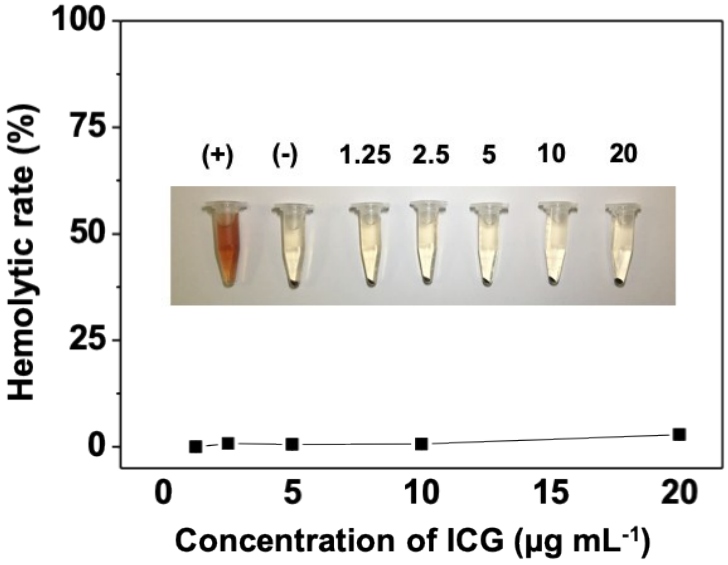

Fig. S8 Hemolytic rate of RBCs after incubation with Au NCs-ICG solutions with different concentration of ICG.

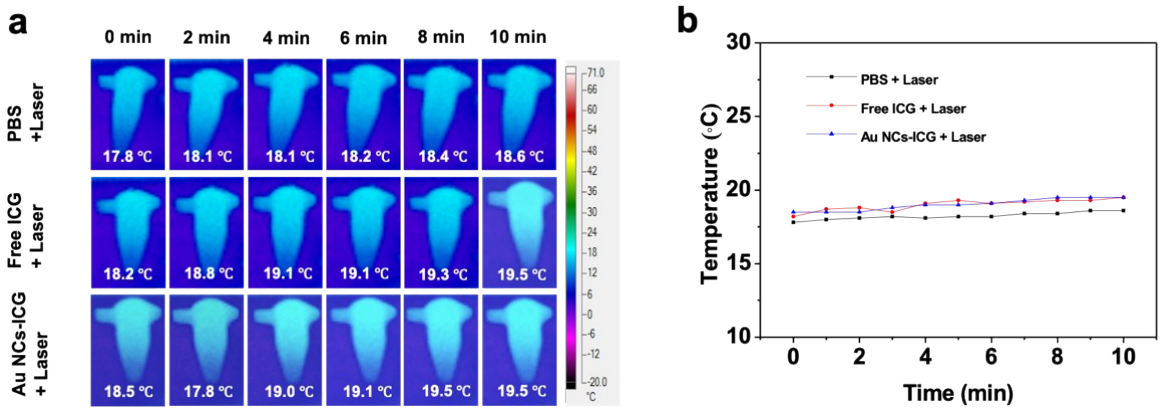

Fig. S9 (a) Thermal images of PBS, free ICG, and Au NCs-ICG under 808 nm laser irradiation (0.65 W cm^{-2}, 10 min) in ice bath. (b) Temperature variation during 808 nm laser irradiation (0.65 W cm^{-2}, 10 min) in ice bath.

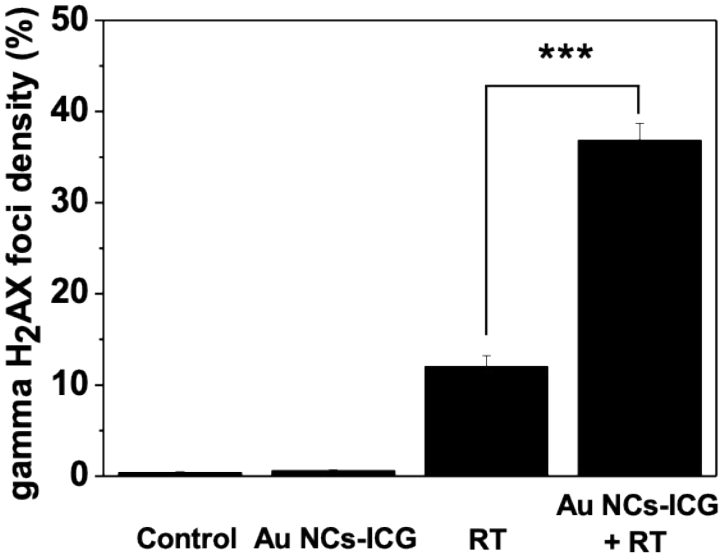

Fig. S10 Semiquantification of gamma H_2AX foci density (foci 100 μm^{-2}) using the Image J software. ***$p < 0.001$.

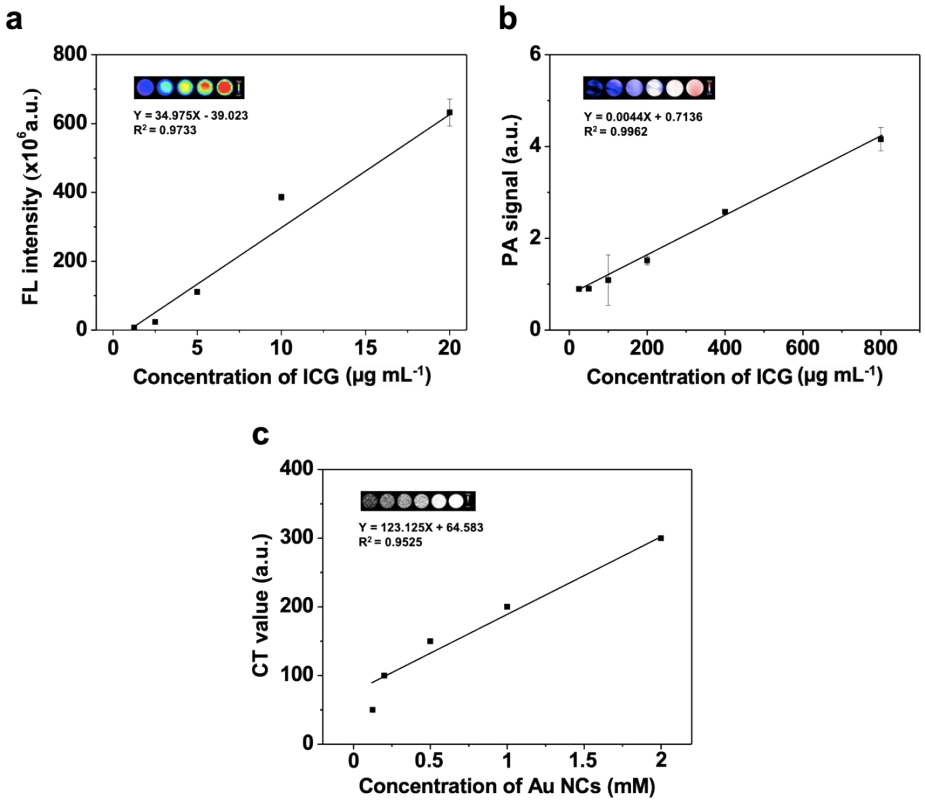

Fig. S11 (a) *In vitro* FL imaging of Au NCs-ICG with various concentrations. (b) *In vitro* PA imaging of Au NCs-ICG with a series of concentrations. (c) *In vitro* CT imaging of Au NCs-ICG with different concentrations.

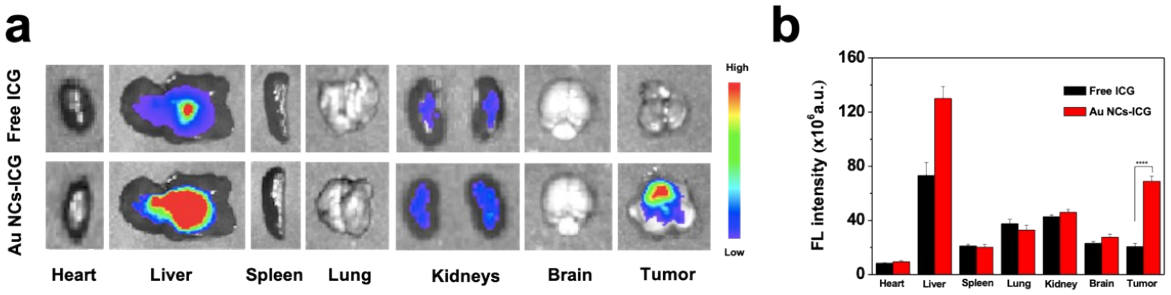

Fig. S12 (a) *Ex vivo* FL images of the tumors and major organs collected from the 4T1 tumor-bearing mice at 24 h post-intravenous injection of free ICG and Au NCs-ICG. (b) Semiquantification of FL signals of images shown in (a). ****$p < 0.0001$.

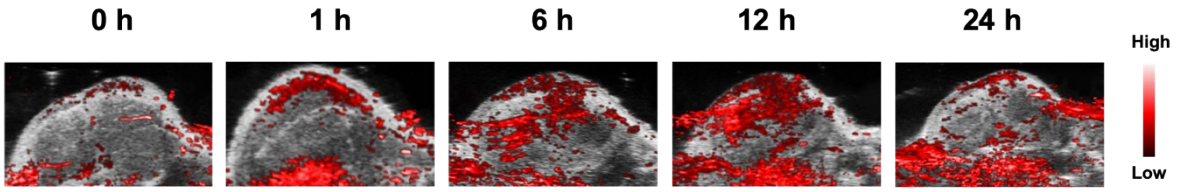

Fig. S13 Tumor blood oxygen saturation of 4T1 tumor-bearing mice at different time post injection of Au NCs via PA imaging system on oxyhemo mode.

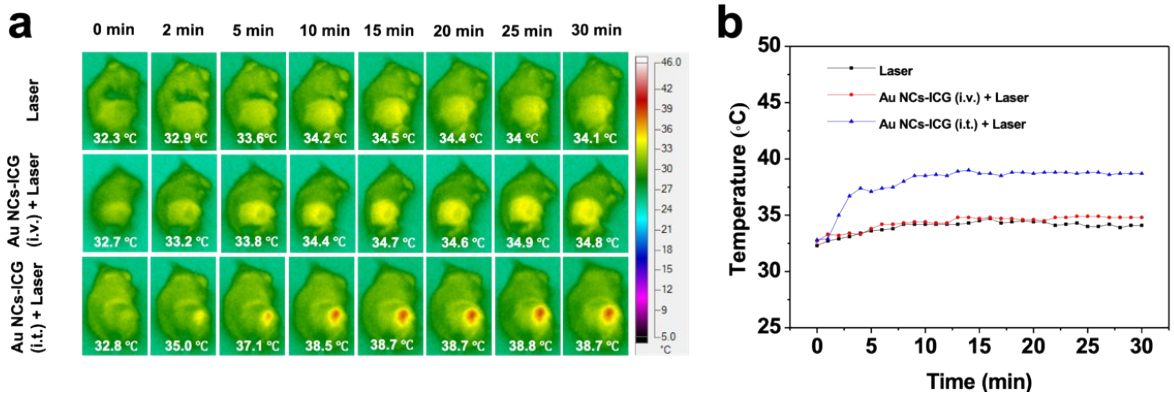

Fig. S14 (a) Thermal images of 4T1-tumor bearing mice received Laser, Au NCs-ICG (i.v.) + Laser, and Au NCs-ICG (i.t.) + Laser treatments (808 nm, 0.3 W cm^{-2}, 30 min). (b) Thermal variation during 808 nm laser irradiation (0.3 W cm^{-2}, 30 min).

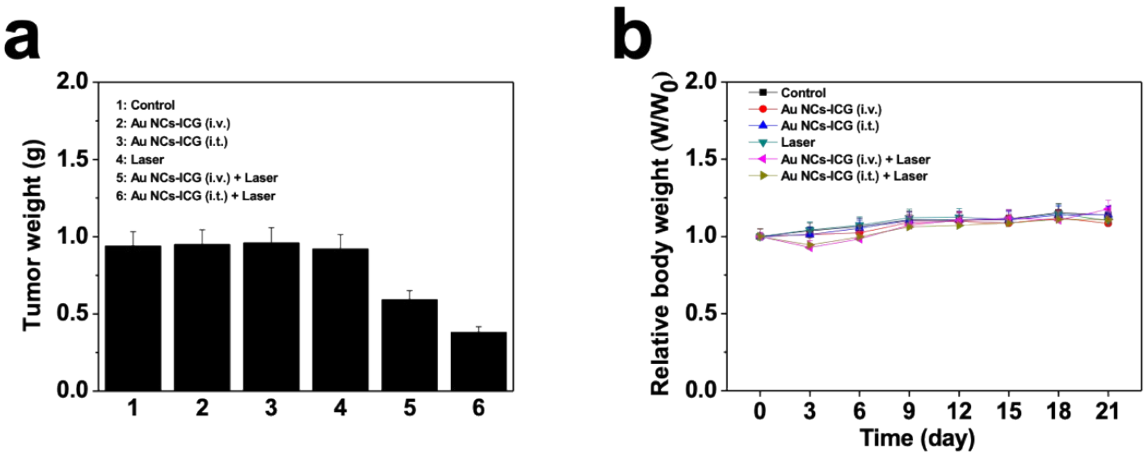

Fig. S15 (a) Tumor weights of mice on the 21st day post-treatments for in vivo PDT. (b) Relative body weights of 4T1 tumor-bearing mice on the 21st day after different treatments for *in vivo* PDT.

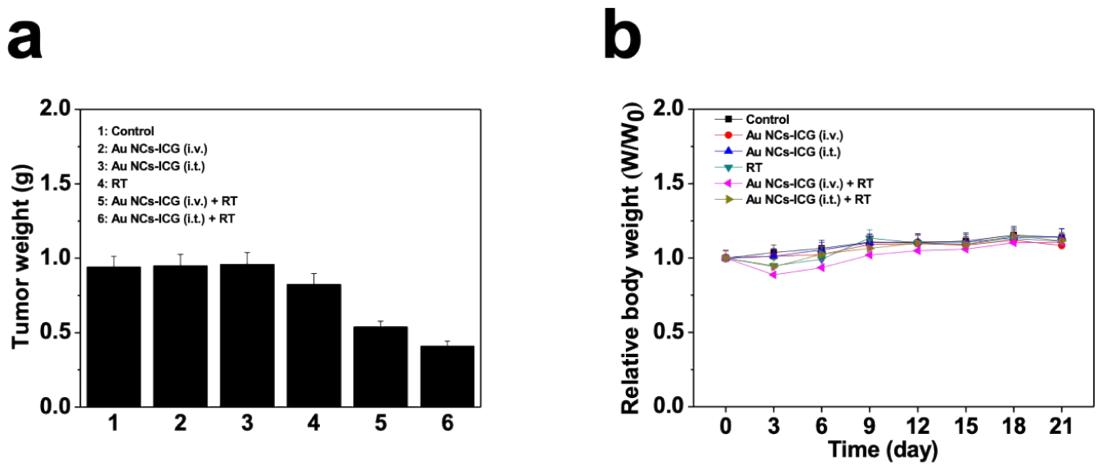

Fig. S16 (a) Tumor weights of mice on the 21st day post-treatments for in vivo RT. (b) Relative body weights of 4T1 tumor-bearing mice on the 21st day after different treatments for *in vivo* RT.

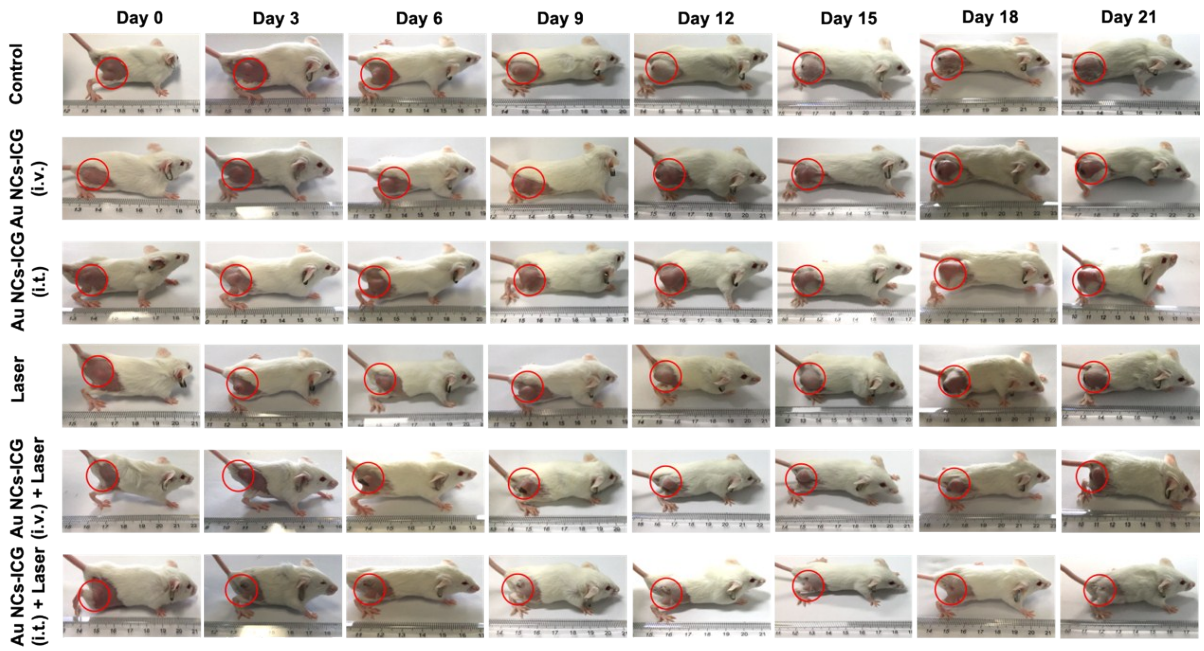

Fig. S17 Representative photos of 4T1 tumor-bearing mice after *in vivo* PDT treatment.

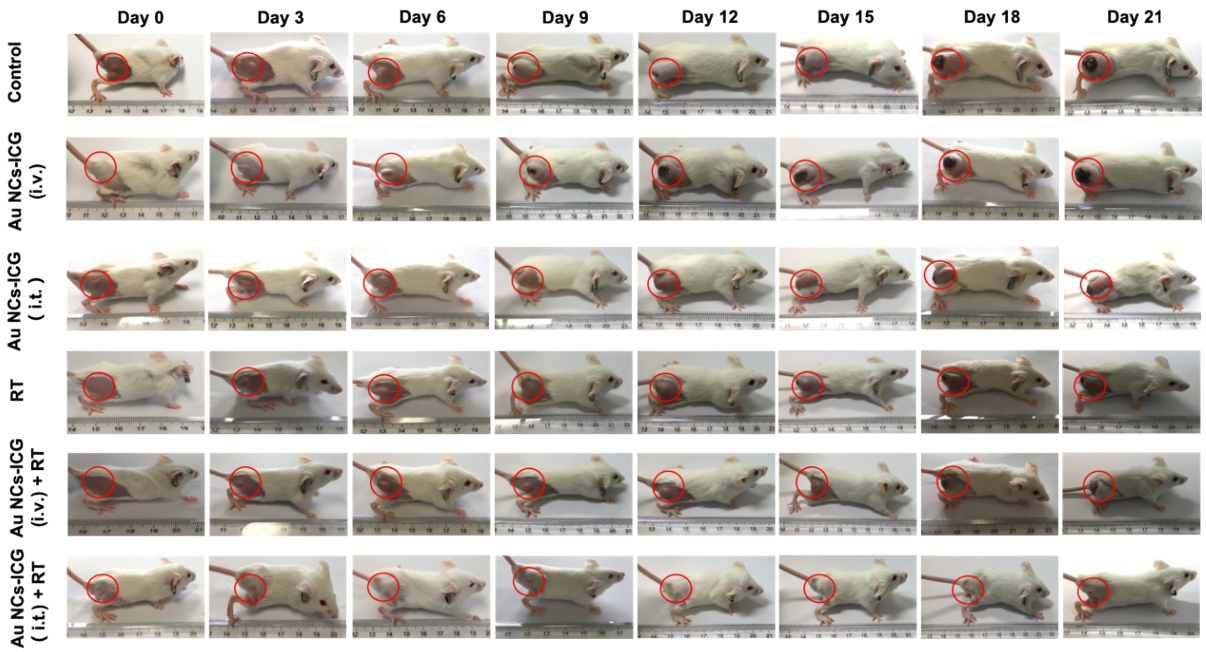

Fig. S18 Representative photos of 4T1 tumor-bearing mice after *in vivo* RT treatments.

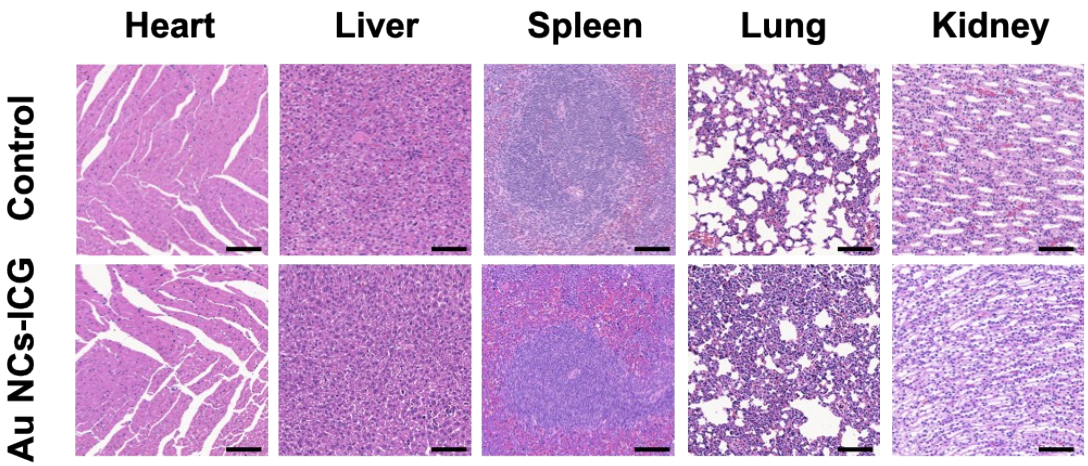

Fig. S19 H&E staining of major organs, including the heart, liver, spleen, lung and kidney, on the 21th day after mice received different treatments. Scale bar = 50 μm.

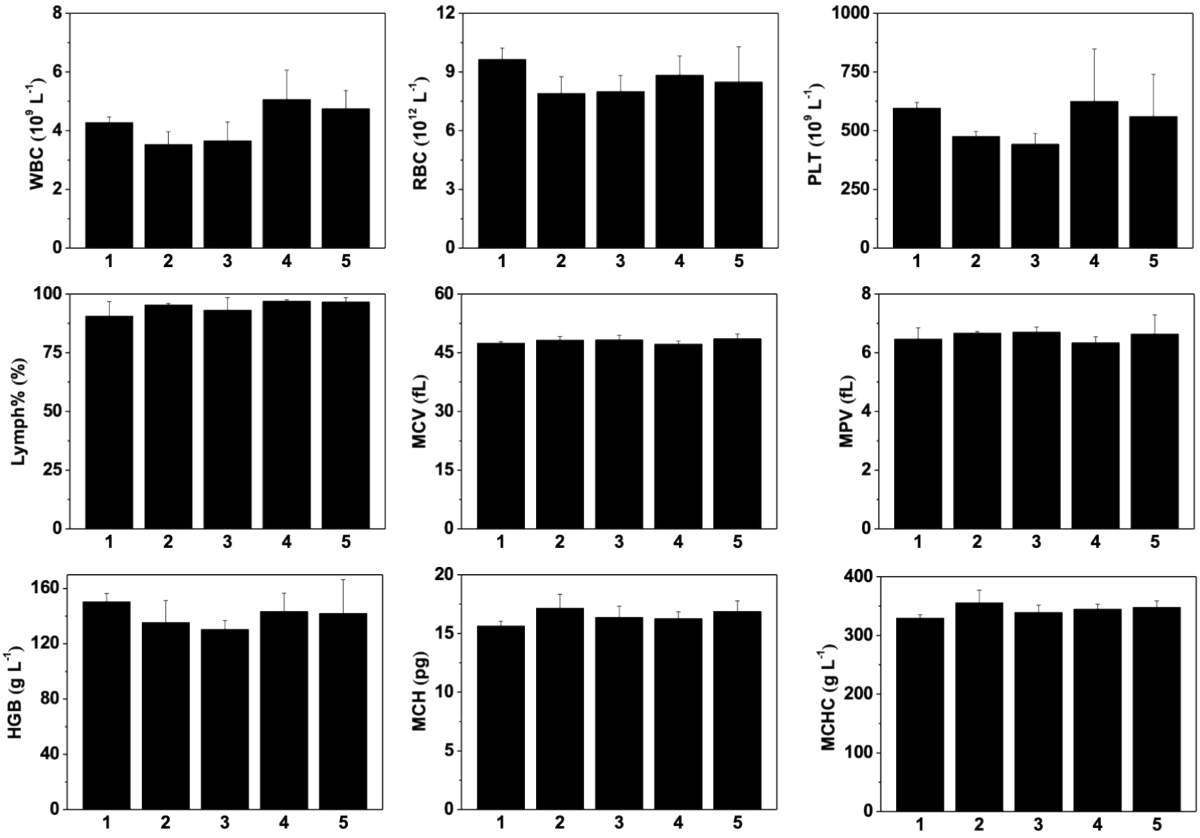

Fig. S20 Blood routine examination for mice of 5 groups: (1) Control; (2) 7 days post-intravenous injection of Au NCs-ICG (ICG dosage = 0.5 mg kg^{-1}); (3) 7 days post-intravenous injection of Au NCs-ICG (ICG dosage = 5 mg kg^{-1}); (4) 16 days post-intravenous injection of Au NCs-ICG (ICG dosage = 0.5 mg kg^{-1}); and (5) 16 days post-intravenous injection of Au NCs-ICG (ICG dosage = 5 mg kg^{-1}).