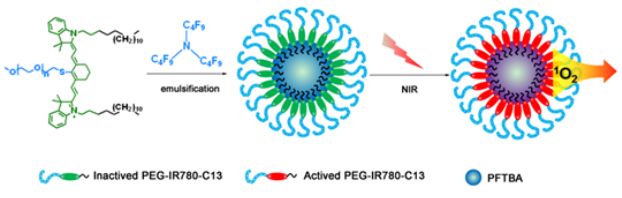
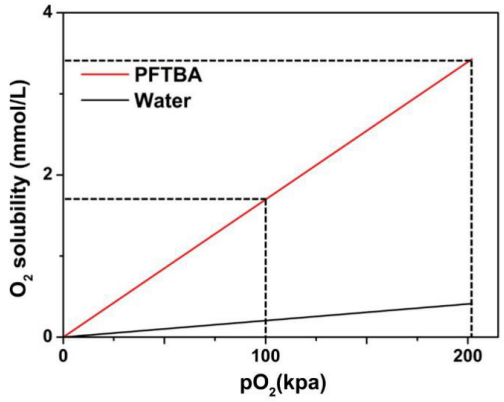
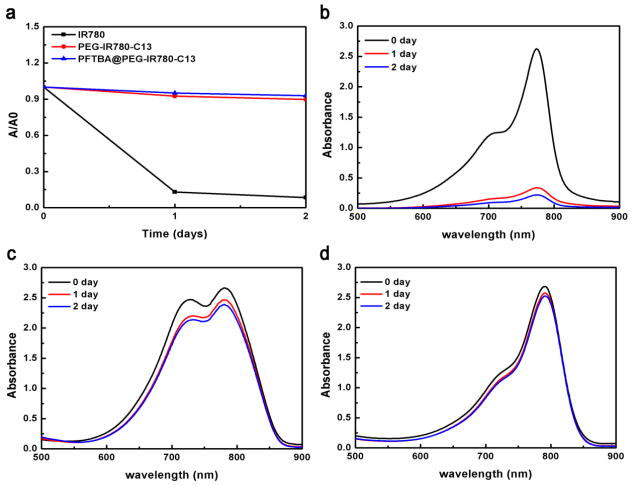


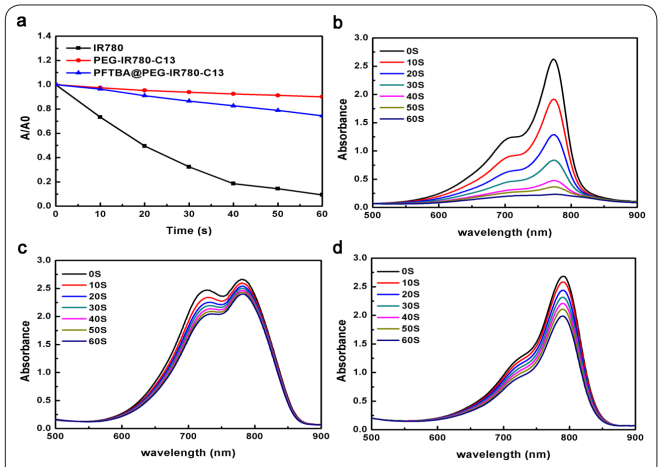
Supplement Figure 1. The operating principle of the experiment design of the nanosystem.



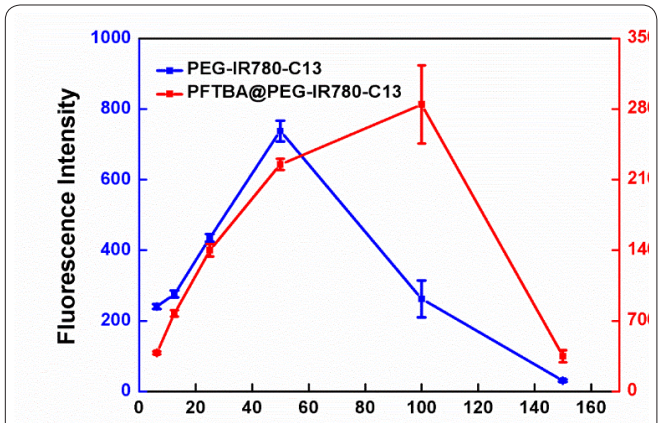
Supplement Figure 2. The oxygen solubility of PFTBA and water, the dissolved oxygen content is much higher than water.



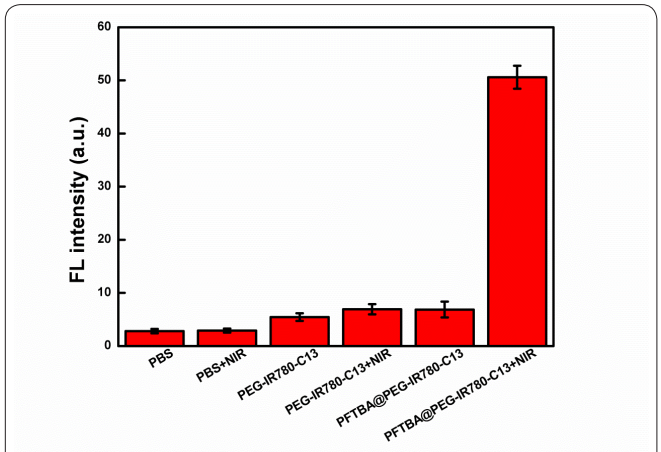
Supplement Figure 3. The photostability of PEG-IR780-C13, PFTBA@ PEG-IR780-C13 and free IR780 stored in darkness. (a) Normalized absorption of PEG-IR780-C13, PFTBA@ PEG-IR780-C13 and free IR780 after 2 days storage in darkness. The UV–Vis absorption spectra of (b) Free IR780. (c) PEG-IR780-C13. (d) PFTBA@ PEG-IR780-C13 after 2 days storage in darkness.



Supplement Figure 4. The photostability of PEG-IR780-C13, PFTBA@ PEG-IR780-C13 and free IR780 after 1 min NIR laser irradiation (808nm, 2 w/cm^2). (a) Normalized absorption of PEG-IR780-C13, PFTBA@PEG-IR780-C13 and free IR780 after 1min NIR laser irradiation. The UV–Vis absorption spectra of: (b) Free IR780. (c) PEG-IR780-C13. (d) PFTBA@PEG-IR780-C13 after NIR laser irradiation.



Supplement Figure 5. The oxygen solubility of PFTBA and water, the dissolved oxygen content is much higher than water.

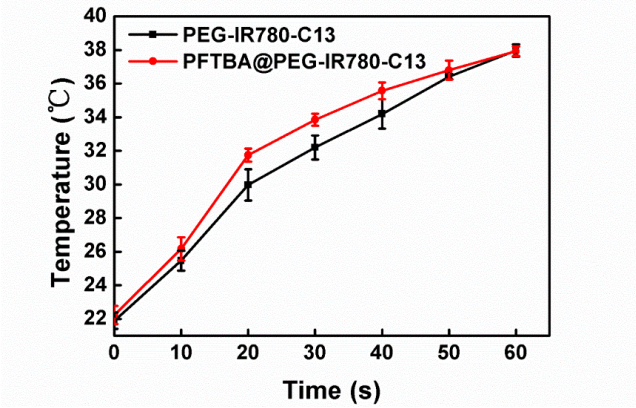


Supplement Figure 6. The semiquantitative analysis of the green fluorescence intensity of different agents in cellular ROS generation (n=6), analysised by Image J software.

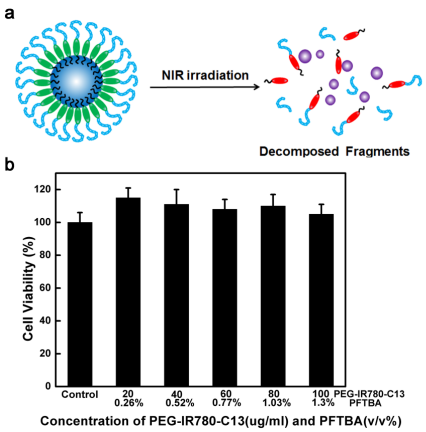
Supplement Table 1. calculation of singlet oxygen quantum yield*.

Photosensitizers	Φso
Ce6	0.7
PEG-IR780-C13	0.130
PFTBA@PRG-IR780-C13	0.417

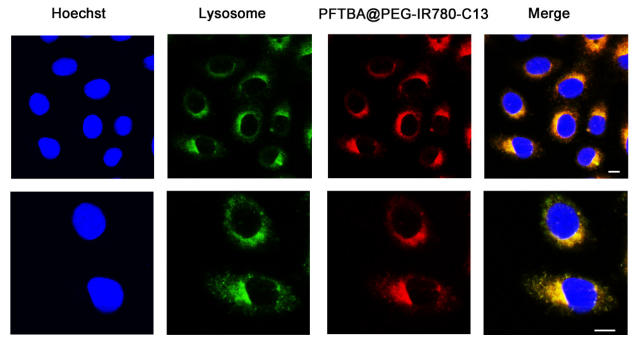
*These data were approximate calculations, Ce6 as the standard agent.



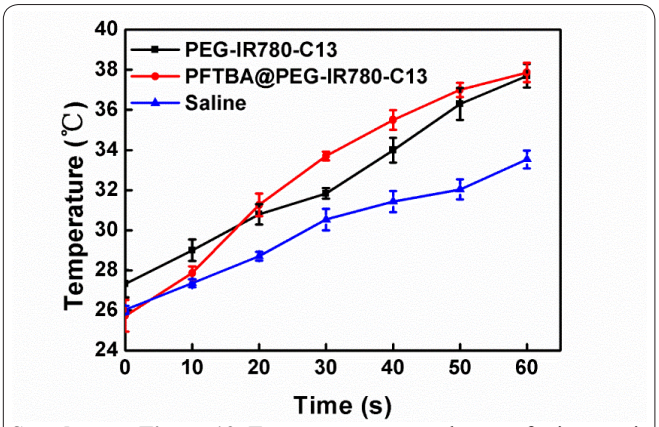
Supplement Figure 7. Heating curves of PFTBA@PEG-IR780-C13 and PEG-IR780-C13 with the equivalent PEG-IR780-C13 concentration at 0.1 mg/mL irradiated by the 808nm laser at the power density of 2W/cm ^{2}.



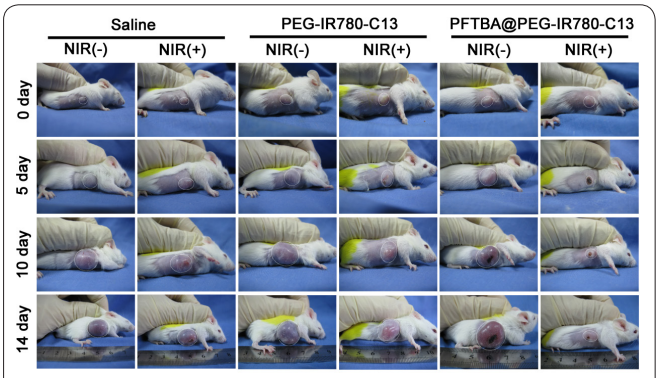
Supplement Figure 8. (a)A scheme of decomposed products of PFTBA@PEG-IR780-C13 after NIR irradiation. (b)Cell viability of different concentration of PFTBA@PEG-IR780-C13 decomposed products. Medium containing different concentration of PFTBA@PEG-IR780-C13 decomposed products subsequently added to tumor cells after 40s NIR laser irradiation.



Supplement Figure 9. Representative images of distribution of PFTBA@PEG-IR780-C13 in lysosome of Renca cells, Scale bar indicates 5μm.



Supplement Figure 10. Tumor temperature change of mice monitored by the Visual IR thermometer (VT02, Fluke) during laser irradiation.



Supplement Figure 11. Photos of CT26 bearing mice tumor on day 0, 5, 10 and 14 after various treatments progress.