

Supporting Information

Gold Nanocage-Photosensitizer Conjugates for Dual-Modal Image-Guided Enhanced Photodynamic Therapy

Avinash Srivatsan,^{1,§} Samir V. Jenkins,^{2,§} Mansik Jeon,^{3,4,§} Zhijin Wu,⁵ Chulhong Kim,^{3,4,}
Jingyi Chen,^{2,*} and Ravindra Pandey^{1,*}*

¹Photodynamic Therapy Center, Roswell Park Cancer Institute Buffalo, NY 14263 (USA)

²Departments of Chemistry and Biochemistry, University of Arkansas, Fayetteville, AR 72701 (USA)

³Department of Biomedical Engineering, The State University of New York, Buffalo, NY 14260 (USA)

⁴Departments of Electrical Engineering and Creative IT Engineering, Pohang University of Science and Technology, Pohang 790-784 (Republic of Korea)

⁵Department of Biostatistics, Brown University, Providence, RI 02912 (USA)

[§]These authors equally contributed on this work.

*Corresponding authors: Ravindra Pandey: Pavindra.Pandey@RoswellPark.org

(photodynamic therapy), Jingyi Chen: chenj@uark.edu (drug delivery), and Chulhong Kim: chulhong@postech.edu (photoacoustic tomography).

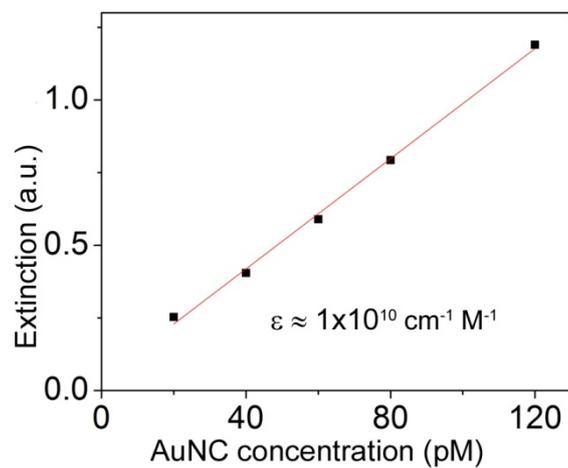


Figure S1. Plot of AuNC concentration against extinction intensity at 802 nm. The particle concentration of AuNCs was estimated from the size and composition of AuNCs directly measured from the TEM and AA analyses. Based on Beer-Lambert law, a linear fit to the data gives the slope of curve as the extinction coefficient of the AuNC to be $1 \times 10^{10} \text{ cm}^{-1} \text{ M}^{-1}$.

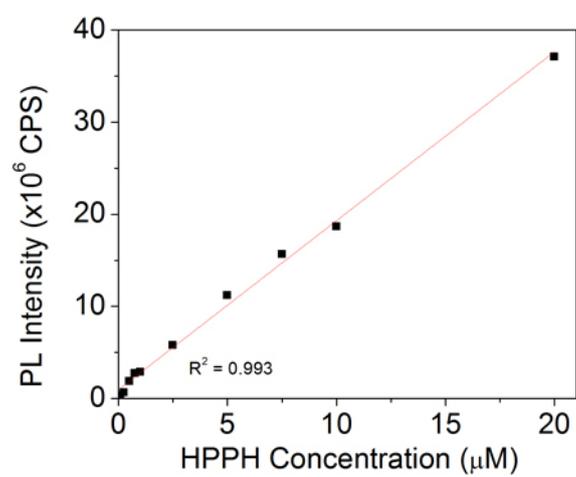


Figure S2. Plot of HPPH concentration against emission intensity at 670 nm as a calibration curve with $\lambda_{\text{ex}} = 605$ nm.

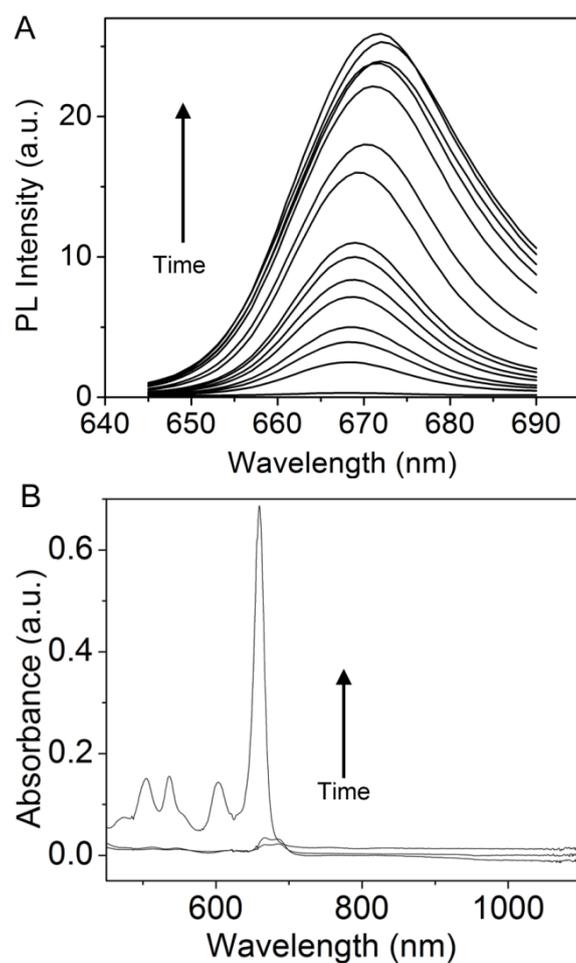


Figure S3. (A) Fluorescence spectra of AuNC-HPPH at different time points of incubation in serum. Spectra were taken after incubation for 20 s, 10, 20, 30, 45, 60, 75, 90, 120 min, 4, 6, 8, 12, and 24 h, as well as post-KCN digestion with $\lambda_{\text{ex}} = 605$ nm. (B) UV-vis absorbance spectra of supernatants of AuNC-HPPH incubated in serum for 5 min and 24 h after 15 min centrifugation at 14000 RPM, as well as post-KCN digestion.

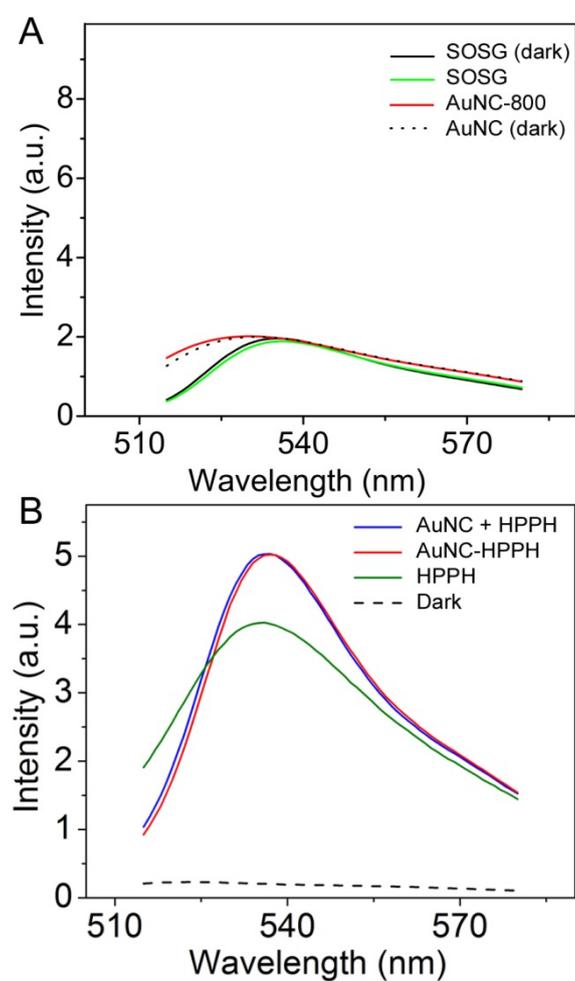


Figure S4. (A) Fluorescence spectra for PBS/D₂O solution of only SOSG before (black) and after (green) irradiation, as well as for PBS/D₂O dispersion of 10 pM AuNC and SOSG before (dashed) and after (red) irradiation. (B) Fluorescence spectra of SOSG in methanol with equimolar HPPH (green), AuNC-HPPH conjugate (red), and mixture of AuNC-PEG and HPPH (blue) with the pre-irradiation signal (dashed).

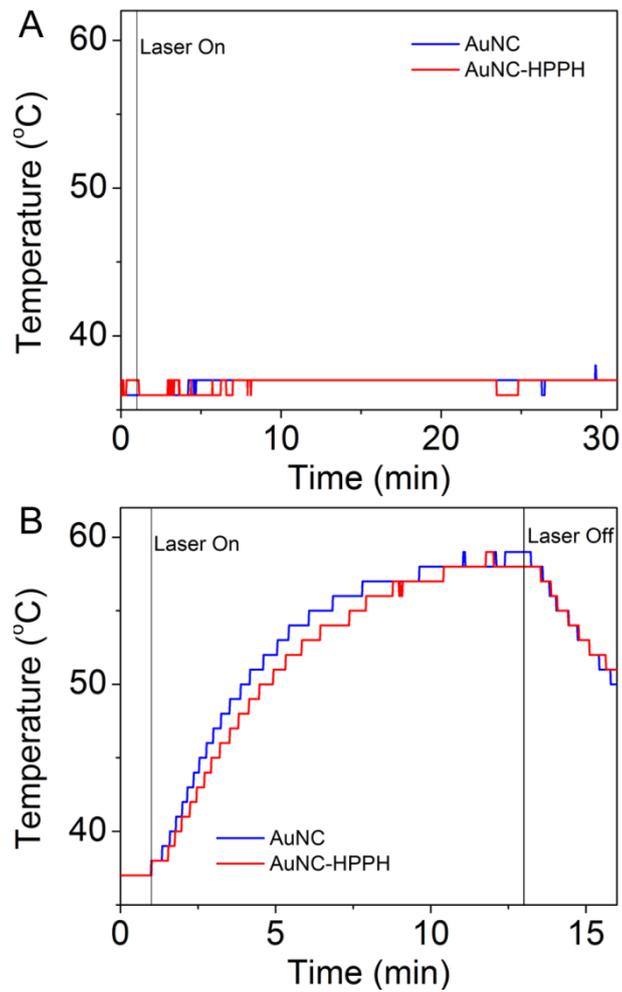


Figure S5. The temperature profile of AuNC and AuNC-HPPH that were irradiated under different conditions: (A) 0.1 nM AuNC irradiated with 665-nm laser at 75 mW/cm² (PDT conditions); and (B) 1 nM AuNC irradiated with 800-nm laser at 0.7 W/cm² (PTT conditions).

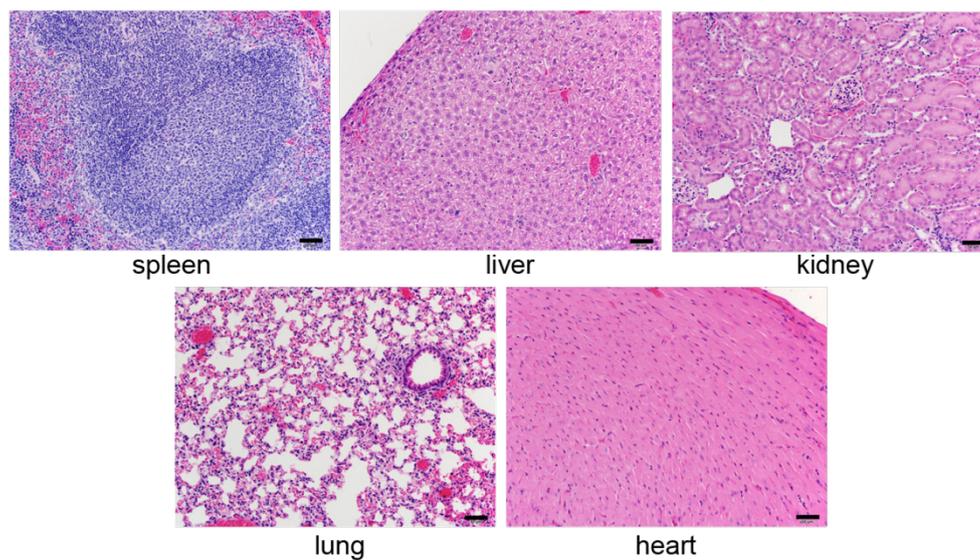


Figure S6. Photographs of representative H&E staining tissue sections of mice after 7 days post-treatment of AuNC-HPPH treated at 0.3 $\mu\text{mol/kg}$ of HPPH. The scale bars are 50 μm .