

# Supporting Information

## **All-in-One Theranostic Nanoplatfom Based on Hollow MoS<sub>x</sub> for Photothermally-maneuvered Oxygen Self-enriched Photodynamic Therapy**

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Li\*

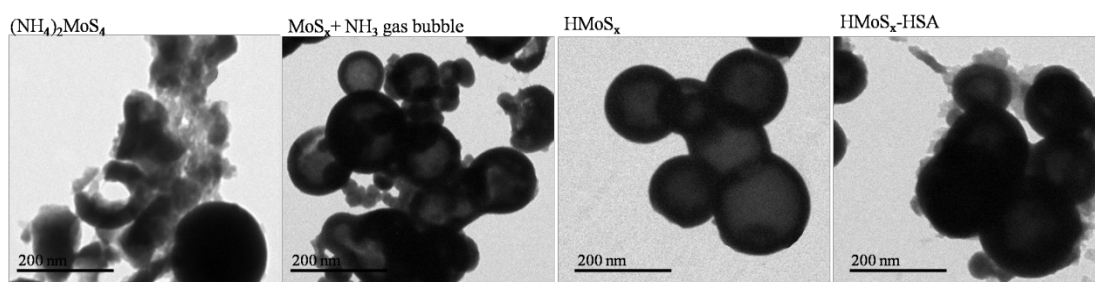
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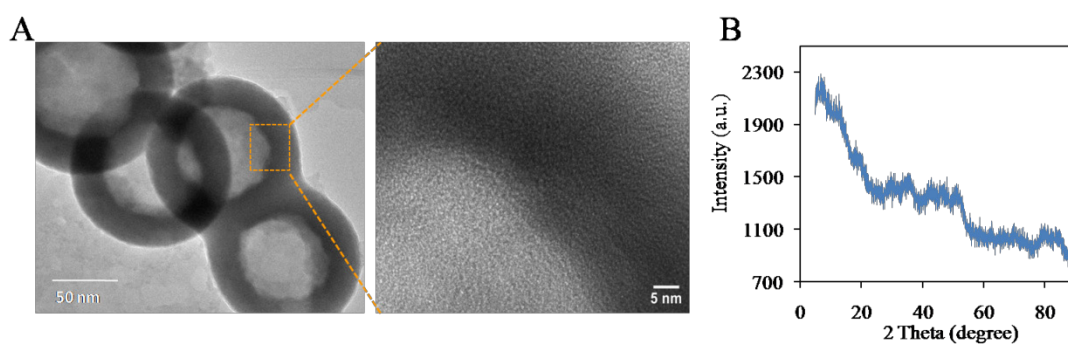
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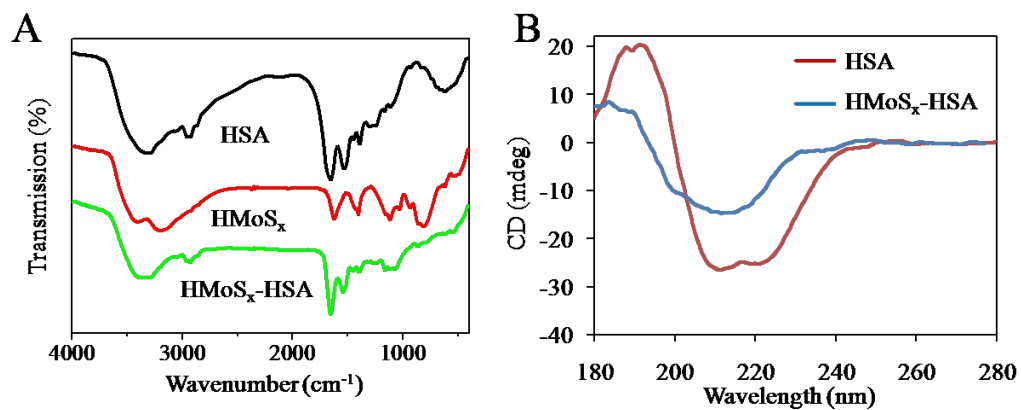
## Figures



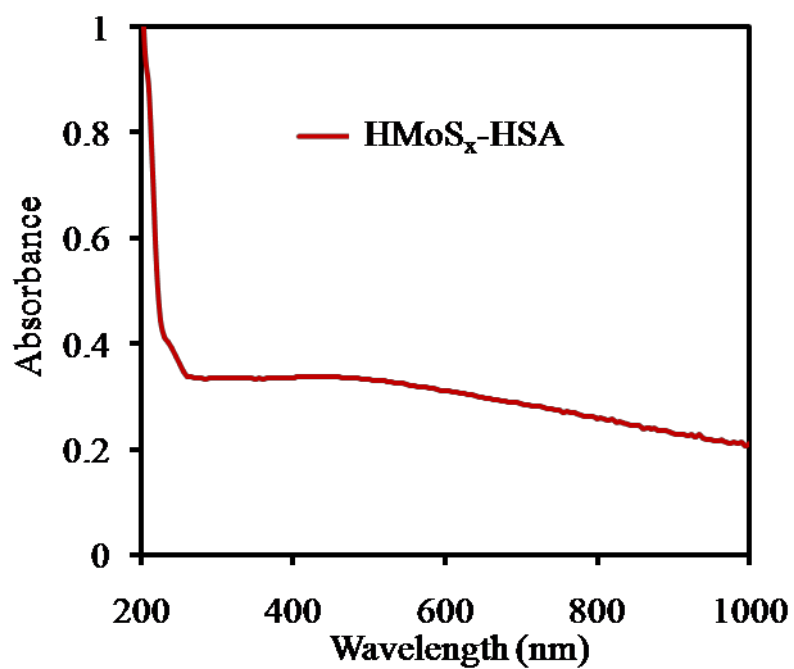
**Figure S1.** The TEM images of the as-prepared  $\text{HMoS}_x\text{-HSA}$  nanoparticles at different reaction steps.



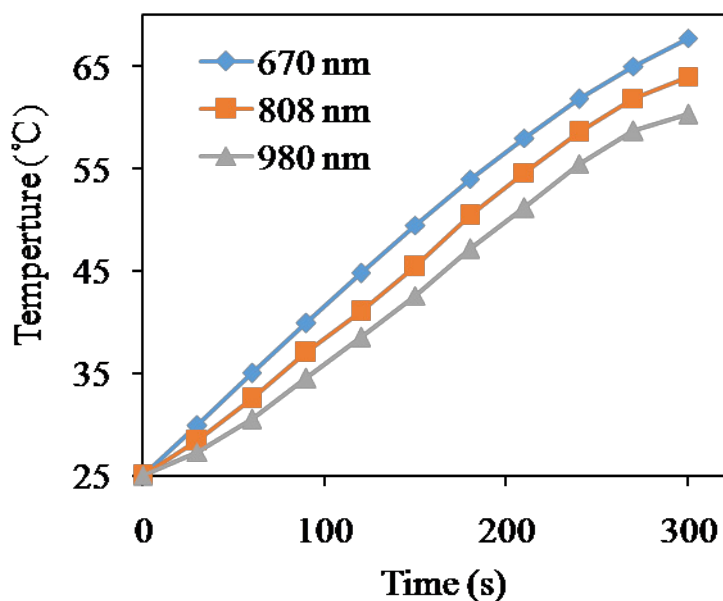
**Figure S2.** (A) HRTEM image of the  $\text{HMoS}_x$  and HRTEM image of a partial enlargement of  $\text{HMoS}_x$ . (B) XRD pattern of as-prepared  $\text{HMoS}_x$ .



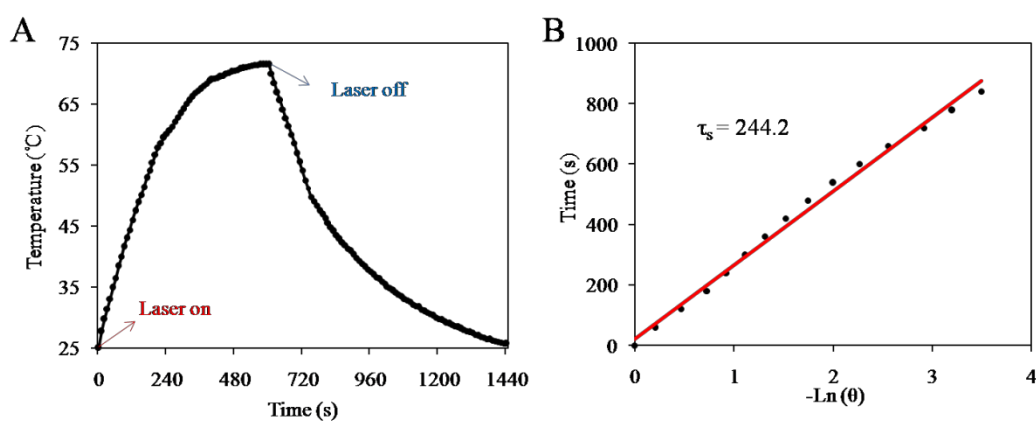
**Figure S3.** (A) FTIR spectra of pure HSA, as-prepared HMoS<sub>x</sub> and HMoS<sub>x</sub>-HSA nanoparticles. (B) CD spectra of pure HSA and HMoS<sub>x</sub>-HSA.



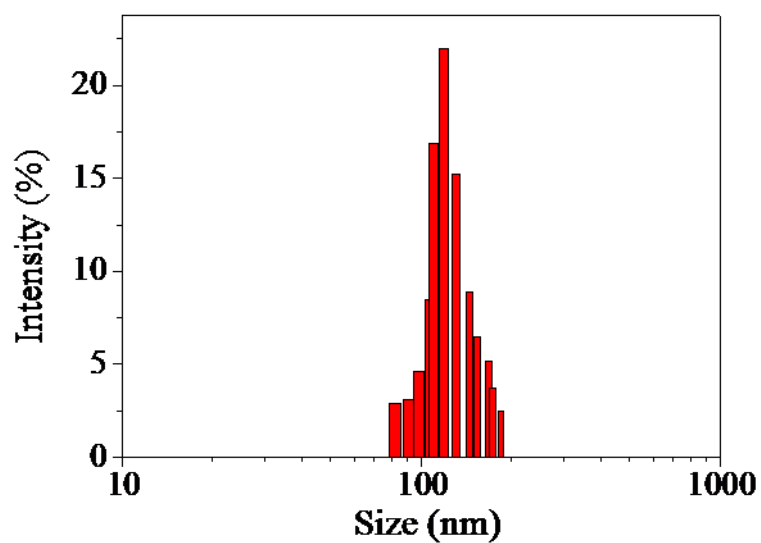
**Figure S4.** UV-vis absorption spectrum of HMoS<sub>x</sub>-HSA nanoparticles.



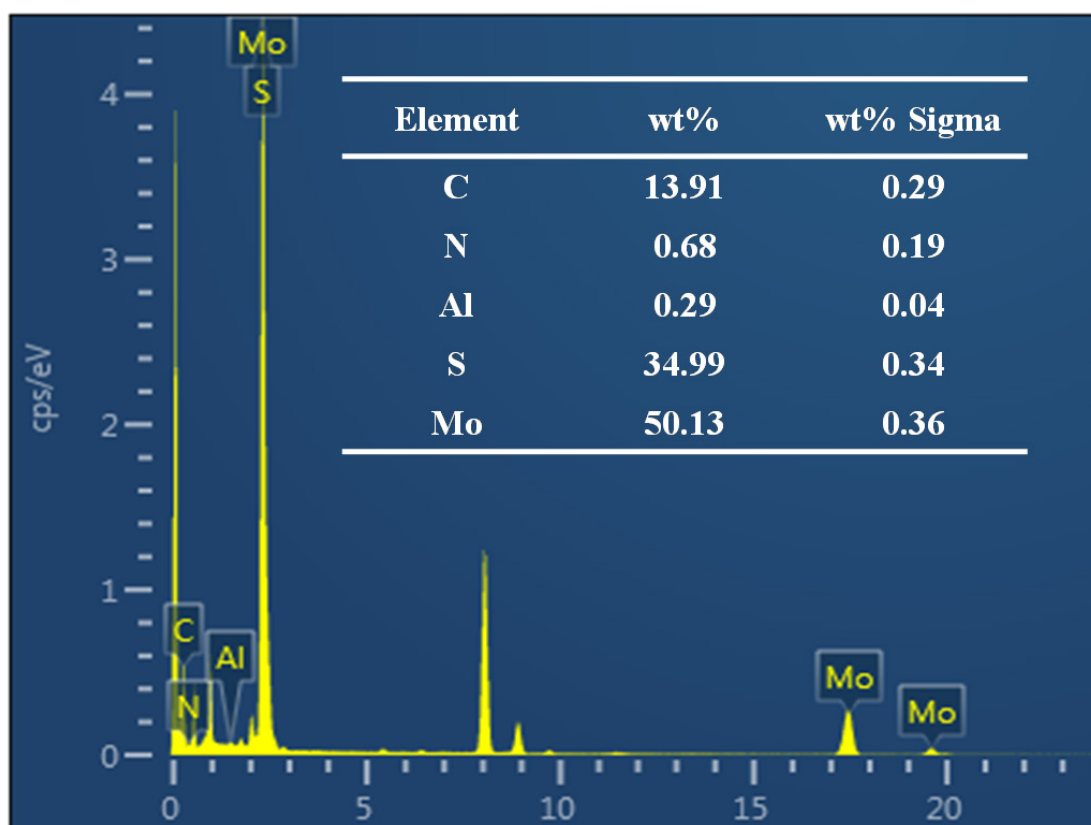
**Figure S5.** Temperature increase of HMoS<sub>x</sub>-HSA nanoparticles under various wavelengths laser irradiation (670, 808, 980 nm) at the same power density of 1 W/cm<sup>2</sup>.



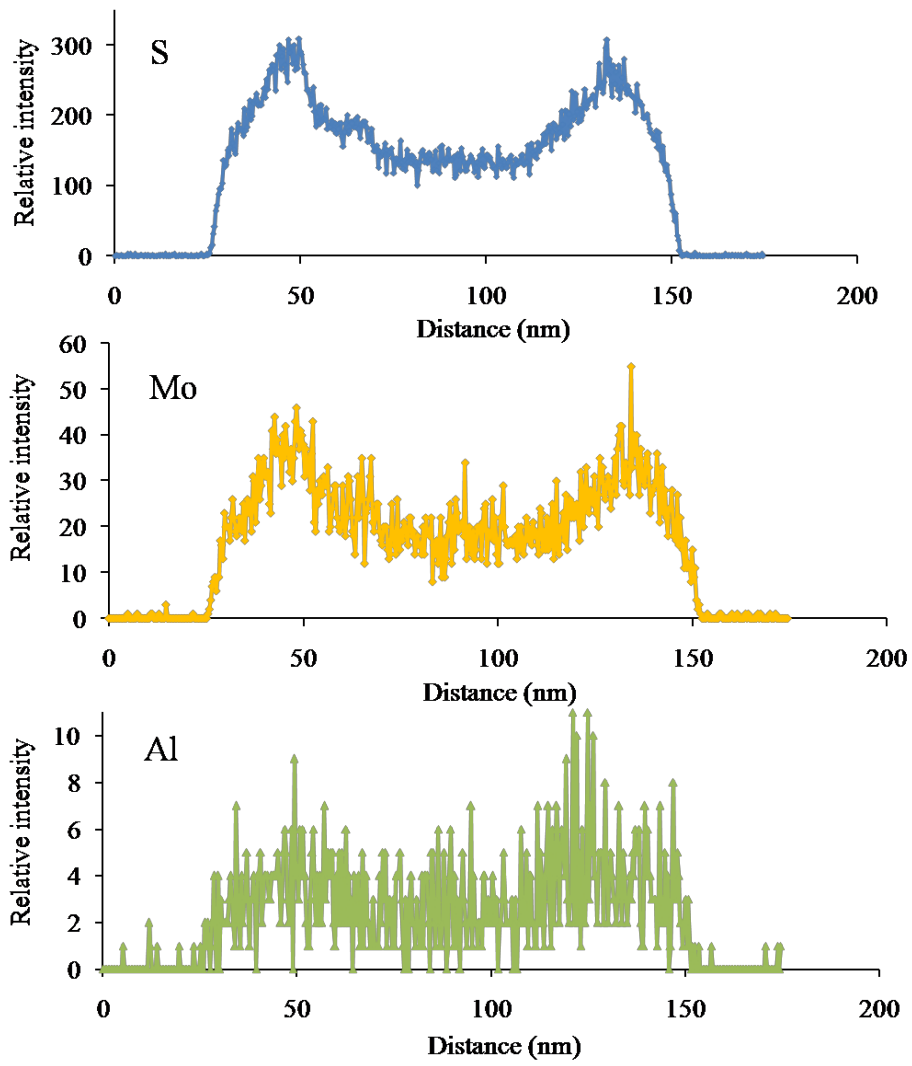
**Figure S6.** (A) Photothermal effect of the irradiation of the aqueous dispersion of HMoS<sub>x</sub>-HSA nanoparticles (0.2 mg/ml) with the 670 nm NIR laser (1 W/cm<sup>2</sup>). The irradiation lasted for 600 s, and then the laser was turned off. (B) Plot of cooling time versus negative natural logarithm of the temperature driving force which is obtained from the cooling stage.



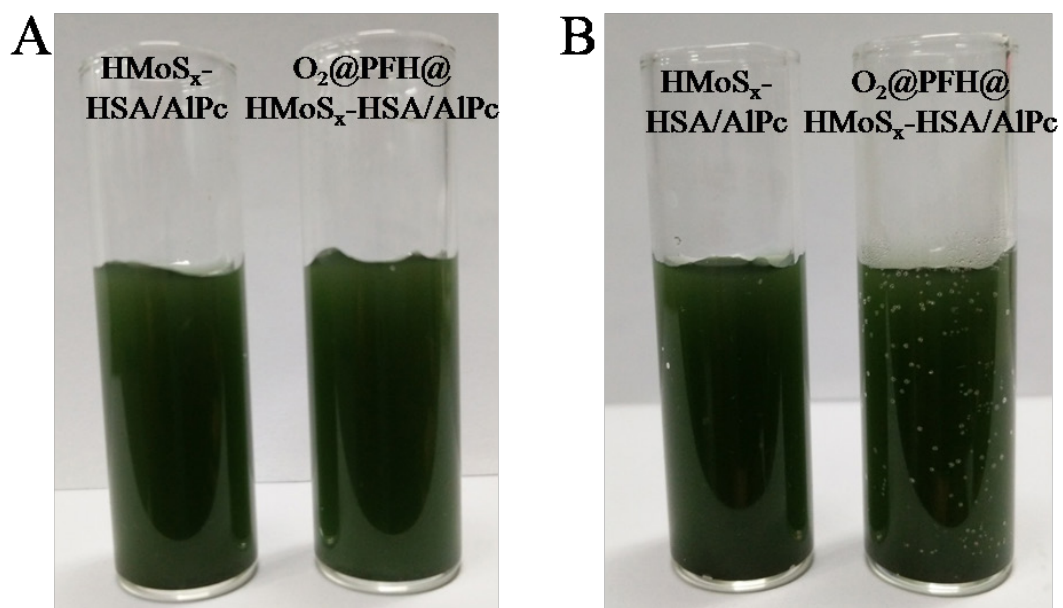
**Figure S7.** Size distribution of the HMoS<sub>x</sub>-HSA/AlPc nanoparticles.



**Figure S8.** EDS of the HMoS<sub>x</sub>-HSA/AlPc nanoparticles.



**Figure S9.** The selective element line scanning HRTEM image of HMoS<sub>x</sub>-HSA/AlPc nanoparticles.



**Figure S10.** Photographs of HMoS<sub>x</sub>-HSA/AlPc dispersion and O<sub>2</sub>@PFH@HMoS<sub>x</sub>-HSA/AlPc dispersion at room temperature (A), or after heating over 60 °C for 1 min (B). A large number of bubbles emerged in the O<sub>2</sub>@PFH@HMoS<sub>x</sub>-HSA/AlPc dispersion after heating, while few bubbles could be found in the HMoS<sub>x</sub>-HSA/AlPc .

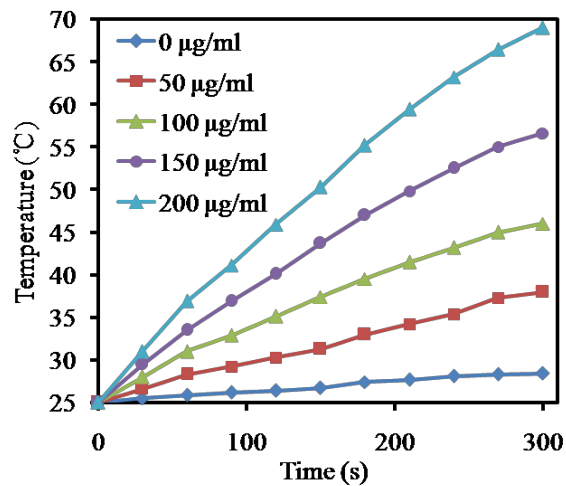


Figure S11. Temperature elevation curves of aqueous solutions containing O<sub>2</sub>@PFH@HMoS<sub>x</sub>-HSA/AlPc with different concentrations under the irradiation of a 670 nm laser (1 W/cm<sup>2</sup>).

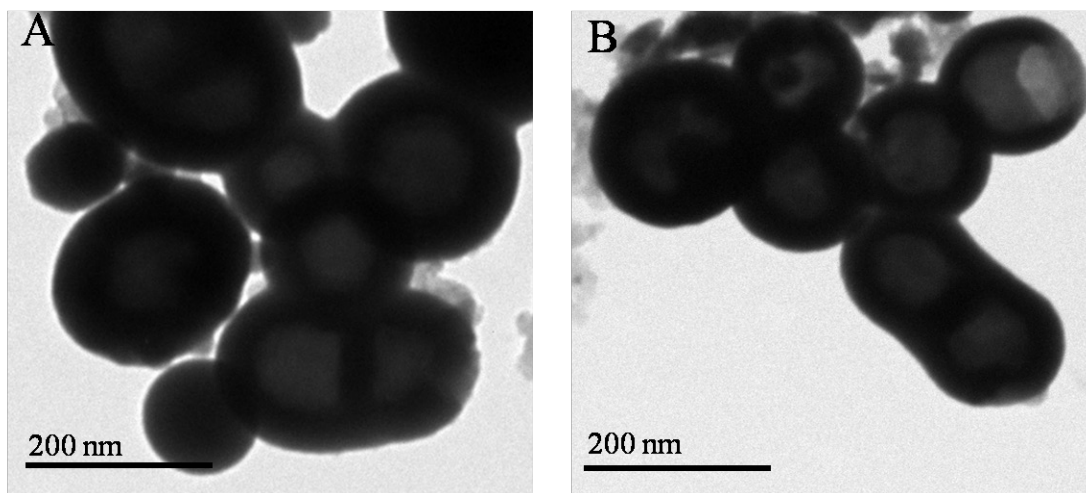
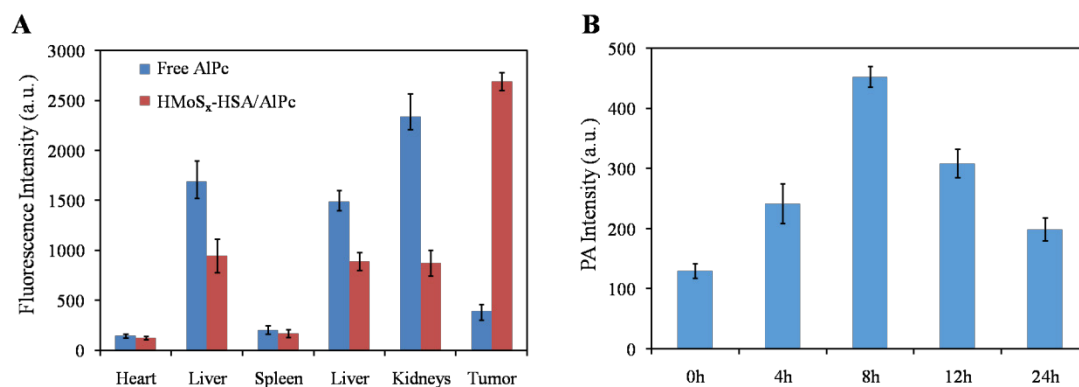
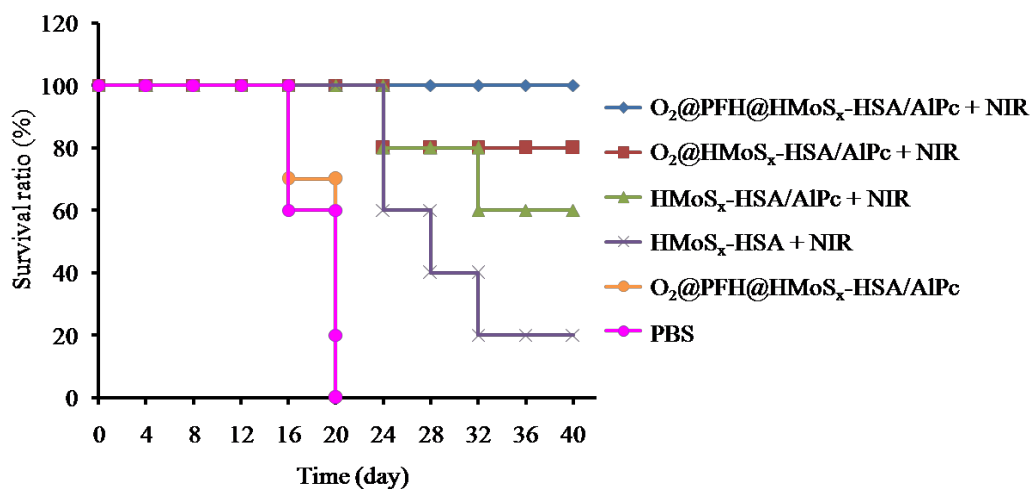


Figure S12. TEM images of HMoS<sub>x</sub>-HSA before and after 670-nm laser irradiation (1 W/cm<sup>2</sup>, 5 min).

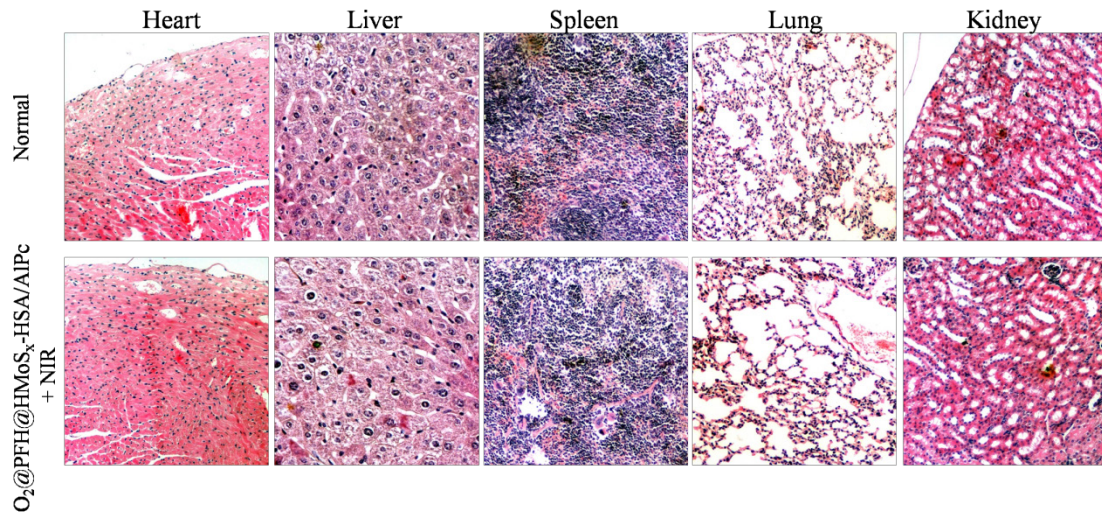




**Figure S13.** (A) Average fluorescence signals of tumors at different time points after administration of free AlPc and HMoS<sub>x</sub>-HSA/AlPc nanoparticles. (B) Photoacoustic signal intensity of the HMoS<sub>x</sub>-HSA/AlPc nanoparticles in the tumor at different time points.



**Figure S14.** Survival curve of the 4T1 tumor-bearing mice after various treatments.



**Figure S15.** H&E-stained images of major organs (heart, liver, spleen, lung, and kidney) collected from untreated healthy mice and O<sub>2</sub>@PFH@HMoS<sub>x</sub>-HSA/AlPc-injected mice 15 days after NIR laser irradiation treatment.