Supporting Information

Dual Factors Activated Metal-Organic Frameworks Hybrid Nanoplatform for Photoacoustic Imaging and Synergetic Photo-Chemotherapy

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Materials: All chemicals were acquired from commercial vendors without further purification. Palladium acetylacetonate ($Pd(acac)_2$, 99%) was bought from Alfa Aesar, Poly(vinylpyrrolidone) (PVP K30), NaBr, dopamine, zinc nitrate hexahydrate ($Zn(NO_3)_2 \cdot 6H_2O$) and 2-methylimidazole, acetone and N,N-Dimethylpropionamide (DMP) was obtained from Sinopharm Chemical Reagent Co. Ltd. (Shanghai, China). Doxorubicin hydrochloride was obtained from Hualian Chemistry Technology Co, Ltd (Shanghai, China).

Synthesis of 17 nm Pd nanosheets: $Pd(acac)_2$ (10.0 mg), PVP (30.0 mg) and NaBr (10 mg) were first mixed together, and then N,N-dimethylpropionamide (2 mL) and deionized water (4 mL) were added in a glass pressure vessel, fully stirred in the meantime. Then, the vessel was charged with 1 atm CO, heated to 100^{o}C and kept for 1.5 h. The products were collected the and refrigerated at 4^{o}C.

Tumor inoculation: Female Balb/c mice (weight ~18 g) were obtained from Hunan SJA Laboratory Animal Co.，Ltd. The 4T1 murine breast tumor models were generated by subcutaneous injection of 5×10^6 cells in ~50 μL PBS onto the right rear flanks of each mouse. All animal procedures in this paper were performed in accordance with the Guidelines for Care and Use of Laboratory Animals of Hunan University and experiments were approved by the Animal Ethics Committee of College of Biology (Hunan University).

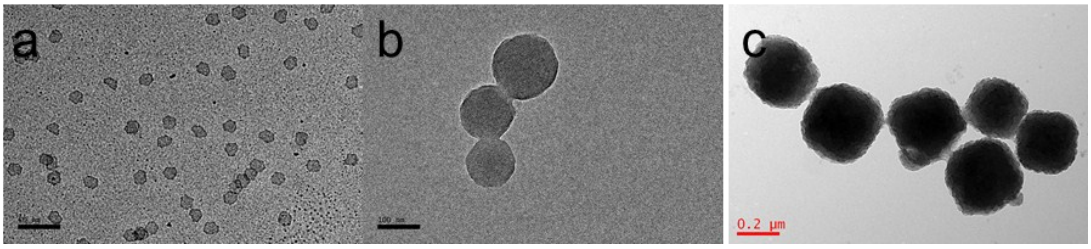

Figure S1. Representative TEM images of Pd nanosheets (a), DOX@ZIF nanoparticles (b), Pd@ZIF nanoparticles (c).

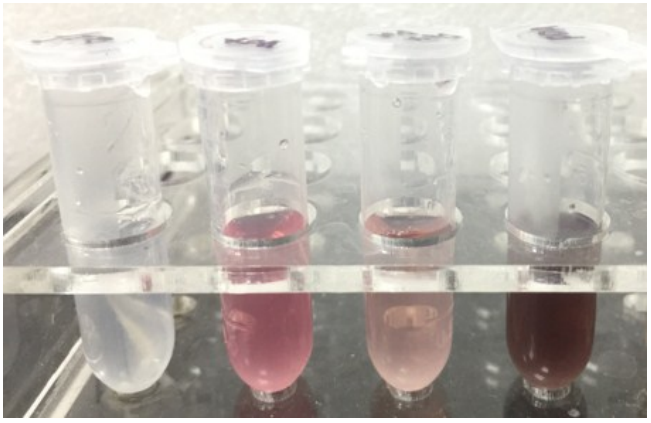

Figure S2. Representative photos of the synthesized nanoparticles in aqueous solution: ZIF-8, DOX@ZIF-8, DOX/Pd@ZIF-8 and DOX/Pd@ZIF-8@PDA.

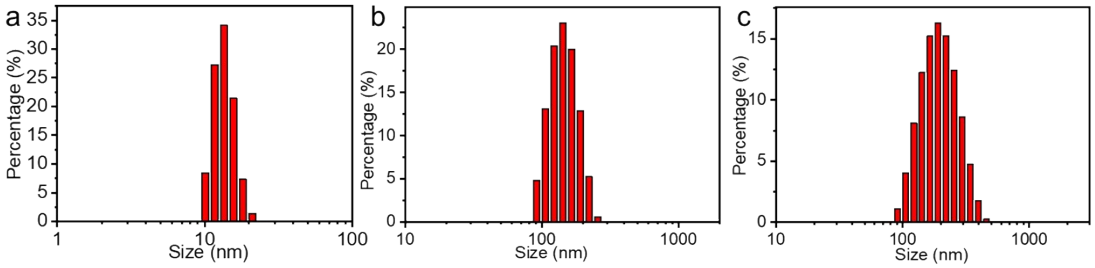

Figure S3. Hydrodynamic size of Pd nanosheets (a) DOX/Pd@ZIF-8 nanoparticles (b) and DOX/Pd@ZIF-8@PDA nanoparticles (c).

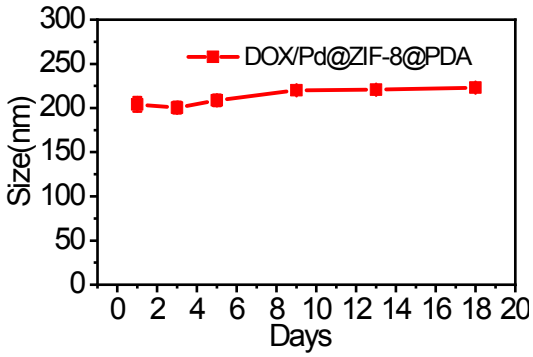

Figure S4. Hydrodynamic diameter of DOX/Pd-@ZIF-8@PDA in 18 days.

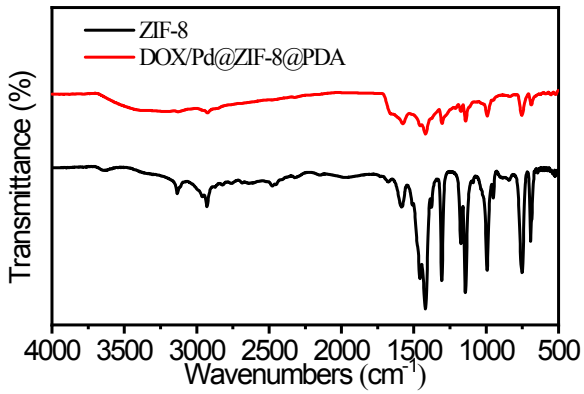

Figure S5. FTIR spectra of ZIF-8 and DOX/Pd@ZIF-8@PDA.

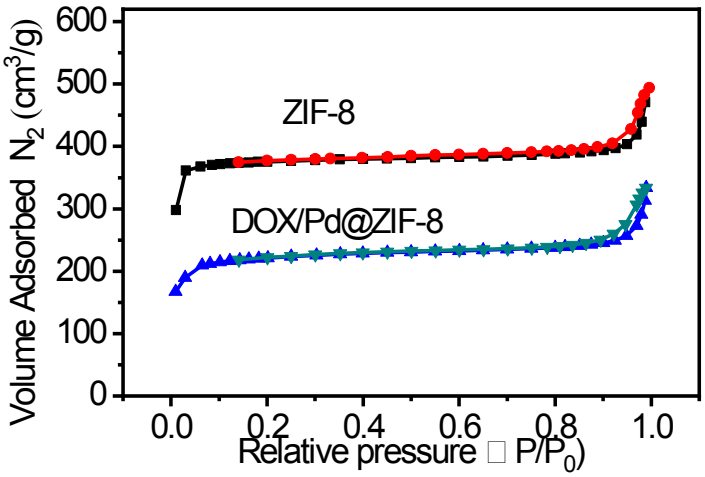

Figure S6. N_2 isothermal adsorption-desorption of ZIF-8 and DOX/Pd@ZIF-8.

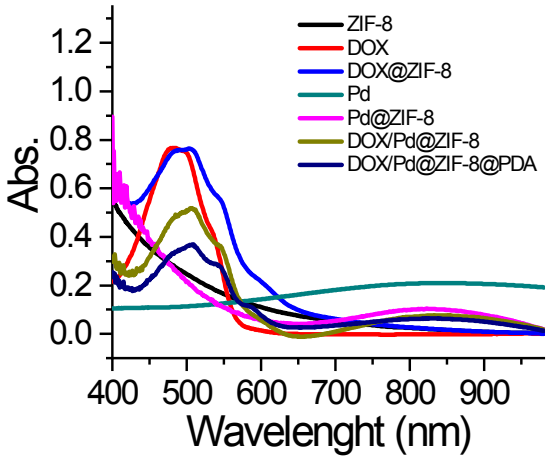

Figure S7. The UV-Vis absorption spectrum of ZIF-8, DOX, DOX@ZIF-8, Pd, Pd@ZIF-8, DOX/Pd@ZIF-8 and DOX/Pd@ZIF-8@PDA.

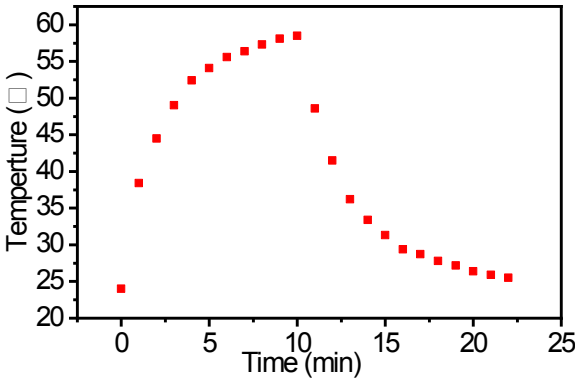

Figure S8. Temperature change curve of DOX/Pd@ZIF-8@PDA with and without laser irradiation.

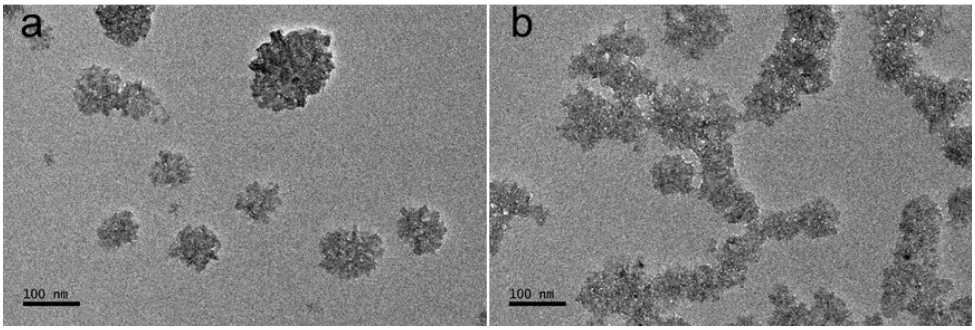

Figure S9. Representative TEM images of DOX/Pd@ZIF-8@PDA at pH 5.7 (a) irradiated by laser for 10 min and (b) irradiated by laser for 20 min.

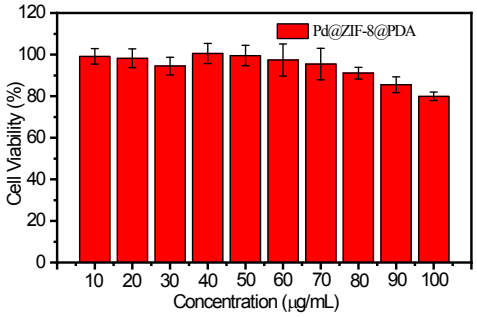

Figure S10. Cell viability of L02 cells incubated with Pd@ZIF-8@PDA at various concentrations.

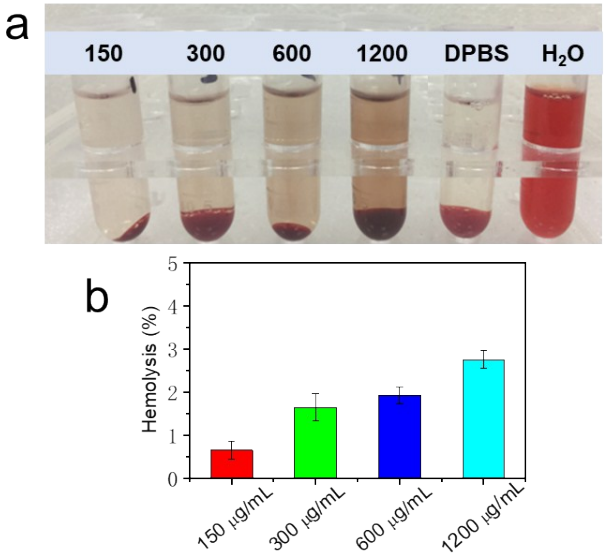

Figure S11. (a) The hemolytic study of DOX/Pd@ZIF-8@PDA.
(b) The hemolysis rate of different concentrations DOX/Pd@ZIF-8@PDA.

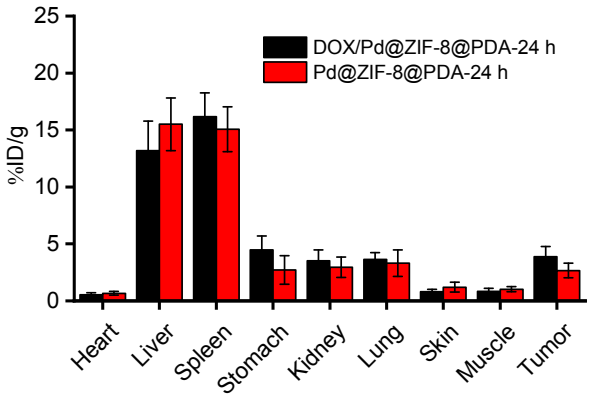

Figure S12. Biodistribution of DOX/Pd@ZIF-8@PDA and Pd@ZIF-8@PDA in BALB/c tumor-bearing mice at 24 h.

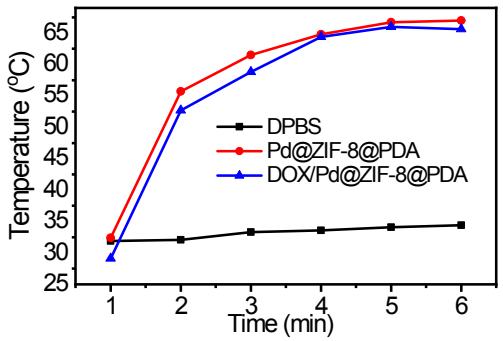

Figure S13. Temperature change of tumor sites with different treatment.

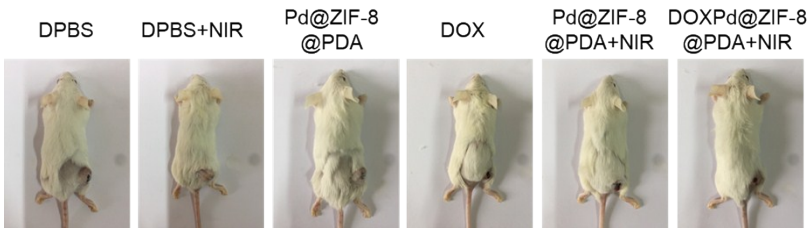

Figure S14. Representative photos of mice with different treatments after 18 days.