Supplementary Information

Photoacoustic shockwave triggers size-shrinkage of nanoparticle to obviously improve tumor penetration and therapeutic efficacy

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Supporting figures

Figure S1

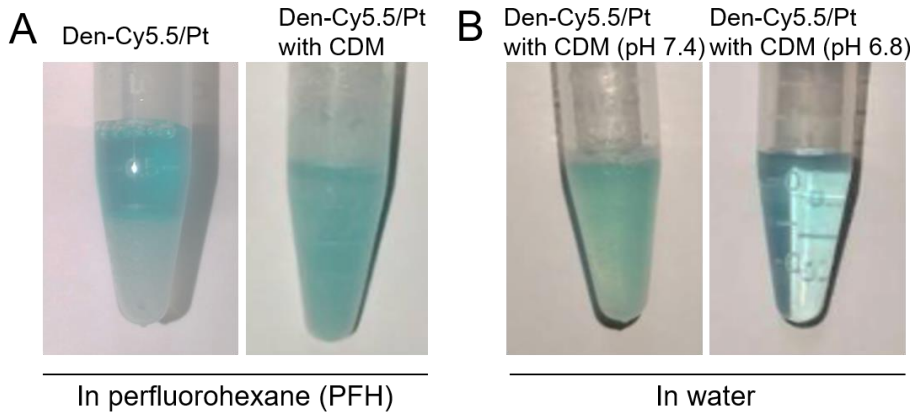

Fig. S1. (A) Photographs of Den-Cy5.5/Pt and Den-Cy5.5/Pt with CDM group dispersed in perfluorohexane. (B) Photographs of Den-Cy5.5/Pt with CDM group dispersed in water with various pH (7.4 and 6.8).

Figure S2

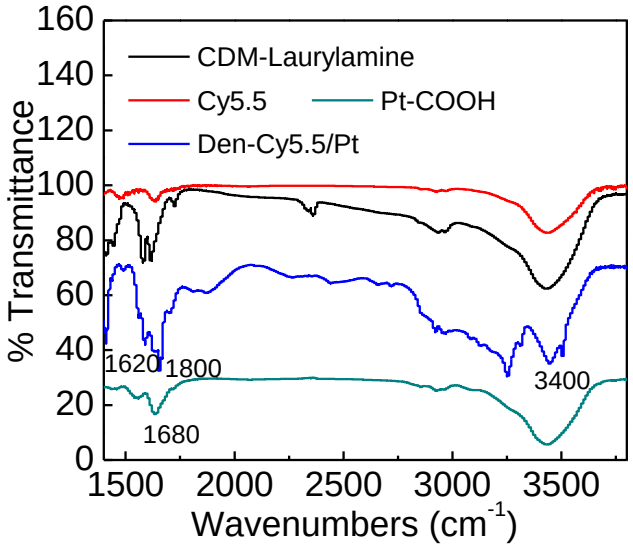

Fig. S2. FT-IR spectra of the Den-Cy5.5/Pt, Cy5.5, CDM-Laurylamine and Pt-COOH.

Figure S3

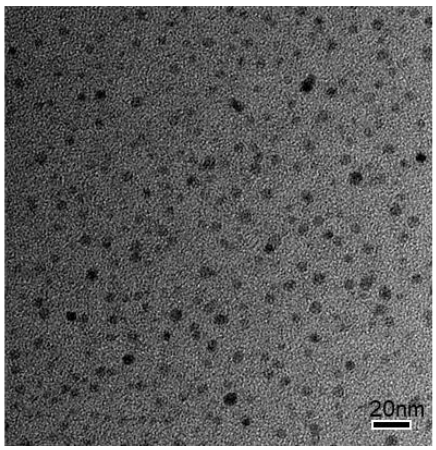

Fig. S3. Transmittance electron microscopy (TEM) images of the Den-Cy5.5/Pt.

Figure S4

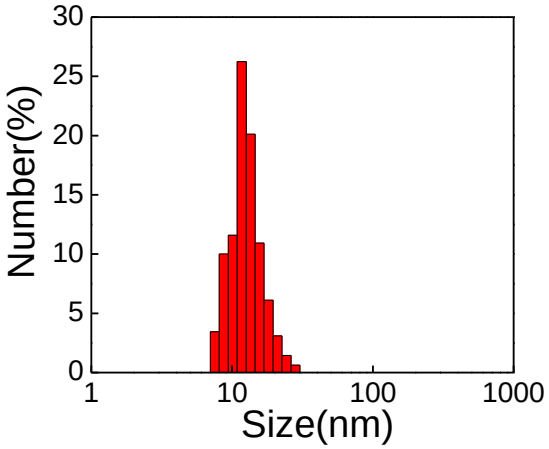

Fig. S4. Dynamic light scattering (DLS) measurements of the size and distribution of the Den-Cy5.5/Pt.

Figure S5

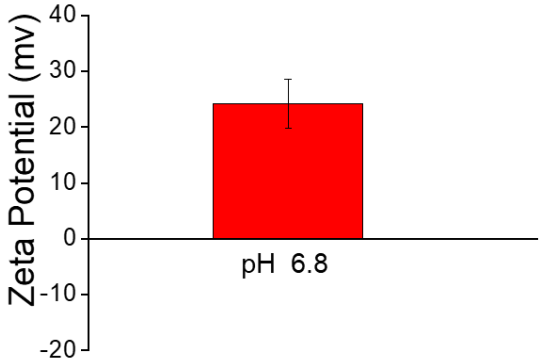

Fig. S5. The zeta potential recorded for the Den-Cy5.5/Pt at pH 6.8 condition.

Figure S6

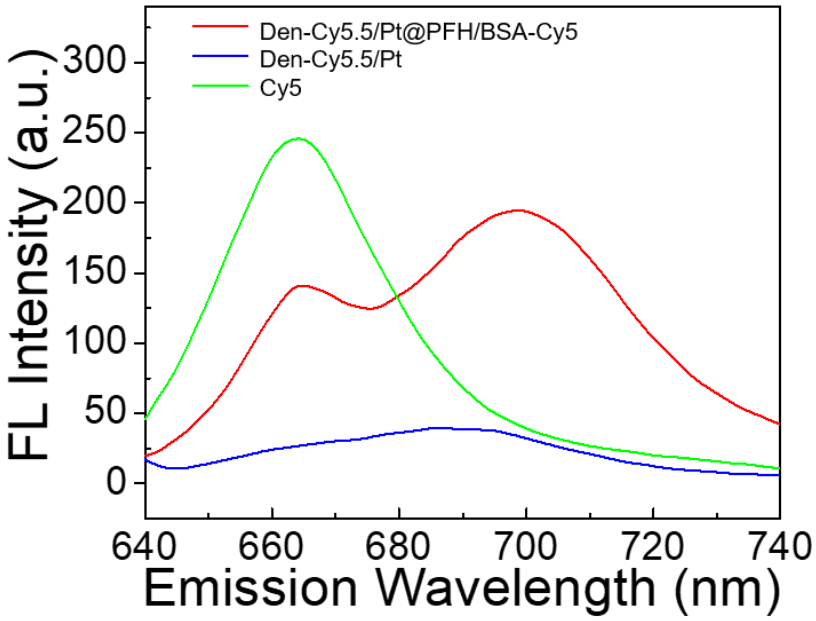

Fig. S6. The fluorescence spectra of Den-Cy5.5/Pt@PFH/BSA-Cy5 (red line), BSA-Cy5 (green line) and Den-Cy5.5/Pt (blue line). The excitation wavelength is 640 nm.

Figure S7

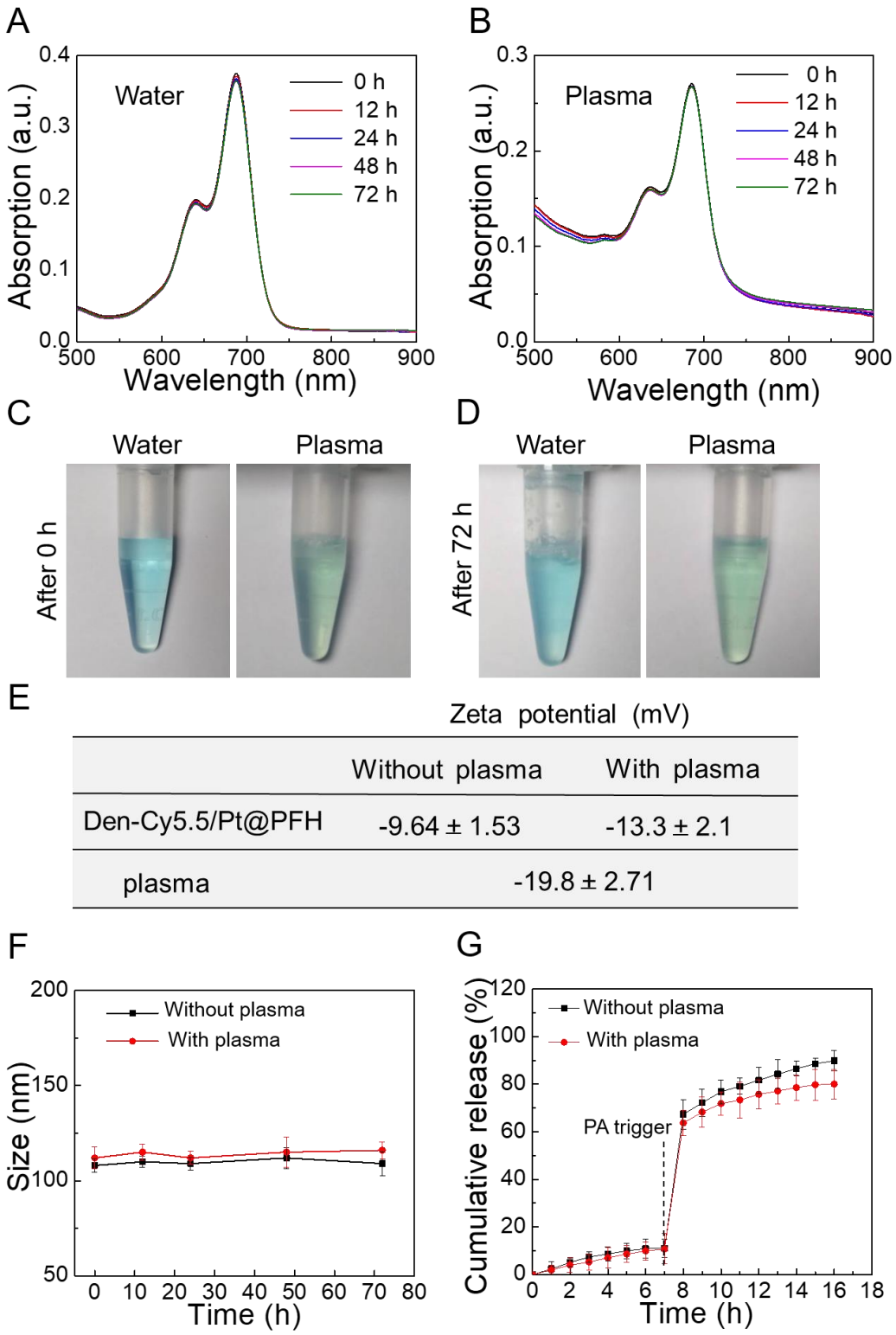

Fig. S7. Interaction of the Den-Cy5.5/Pt@PFH with plasma. The absorption spectra of the Den-Cy5.5/Pt@PFH nanoparticles at predetermined time in 10% plasma (A) and

water (B). (C) and (D) Photographs of Den-Cy5.5/Pt@PFH dispersed in plasma and water after 0 and 72 hours. (E) Zeta potential of the nanoparticles before and after incubation with plasma for 30 min. (F) The size of Den-Cy5.5/Pt@PFH after incubation with plasma for up to 72 h obtained by dynamic light scattering (DLS) analysis. (G) Effect of plasma incubation on the release of Den-Cy5.5/Pt from the Den-Cy5.5/Pt@PFH nano-parcel.

Figure S8

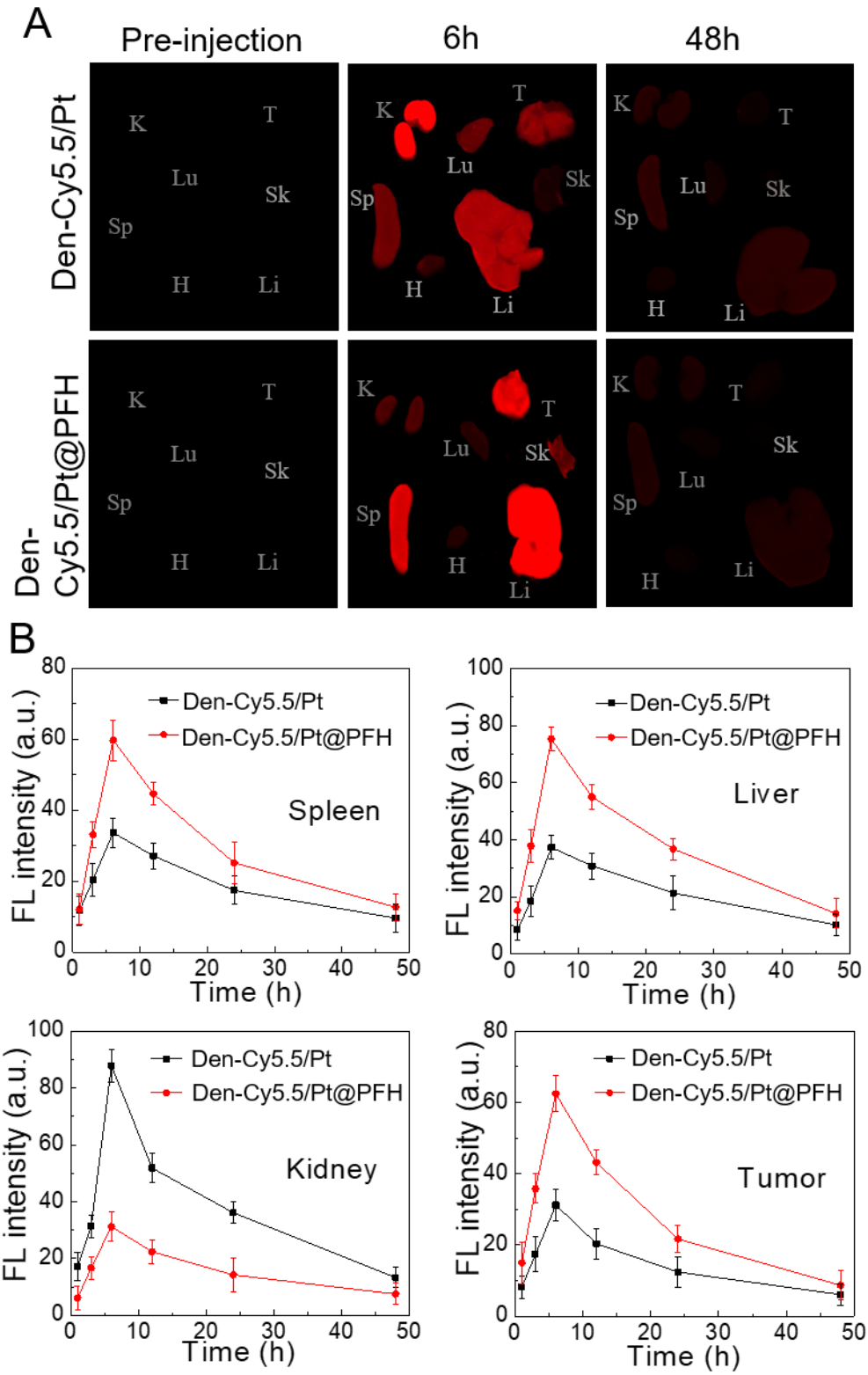
A
Pre-injection
6h
48h
Den-Cy5.5/Pt
Den-Cy5.5/Pt@PFH
K
T
Lu
Sk
Sp
H
Li
B
FL intensity (a.u.)
Time (h)
Den-Cy5.5/Pt
Den-Cy5.5/Pt@PFH
Spleen
Liver
Kidney
Tumor

Fig. S8. *In vivo* biodistribution of Den-Cy5.5 and Den-Cy5.5@PFH. (A) EMT6 tumor bearing BALB/c mice were sacrificed before injection and 6 h, 48 h post injection. The main organs and tumor tissues were spectrally imaged by the ODYSSEY Infrared Imaging System. (Lu: Lung, Li: Liver, Sp: Spleen, H: Heart, Sk: Skin, T: Tumor, K: kidney). (B) The averaged Cy5.5 fluorescent intensity of spleen, liver, kidney and tumor (after removing the tissue auto fluorescence and subtracting the background of each organ before injection) was calculated for a semiquantitative biodistribution analysis. The error bars represent standard error (n = 3 mice)

Figure S9

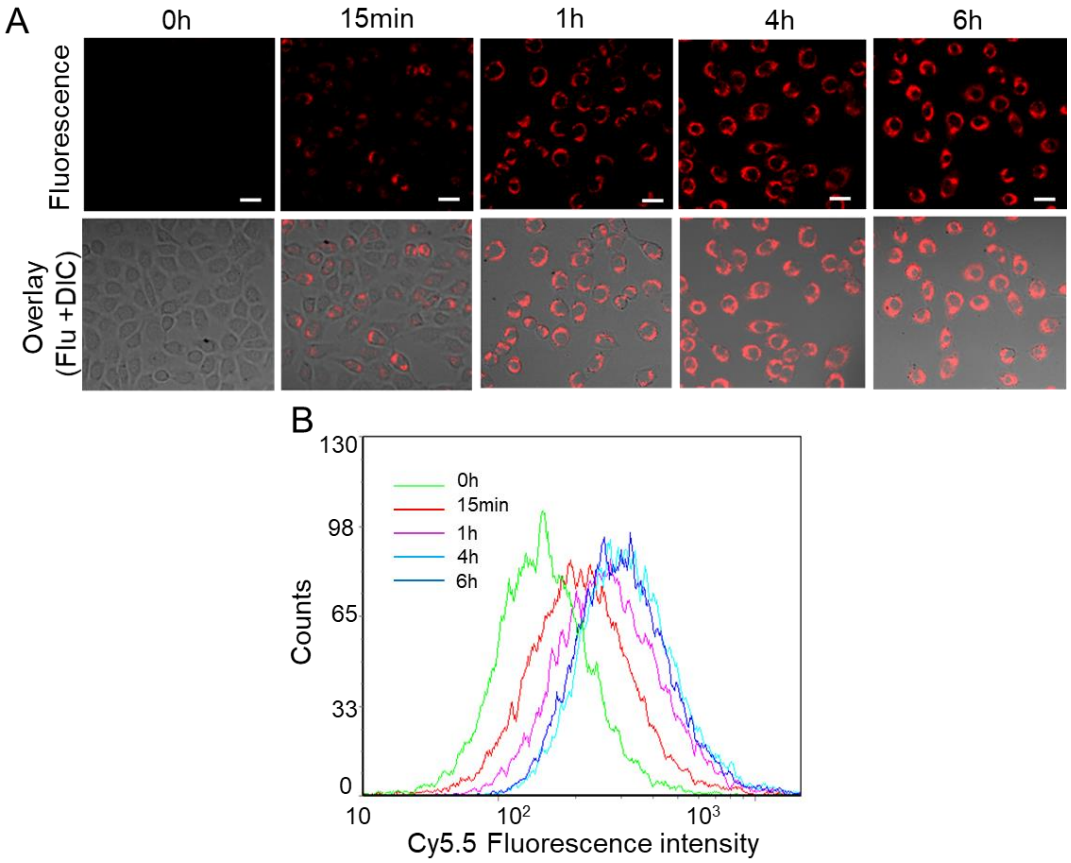

Fig. S9. Cell uptake after incubation with Den-Cy5.5/Pt at different time. (A) CLSM images of EMT6 cells upon 0 h,15 min, 1 h ,4 h and 6 h incubation with Den-Cy5.5/Pt.

(B) Flow cytometry analysis of the intracellular Cy5.5 fluorescence after different incubation. Scale bar=20 μm

Figure S10

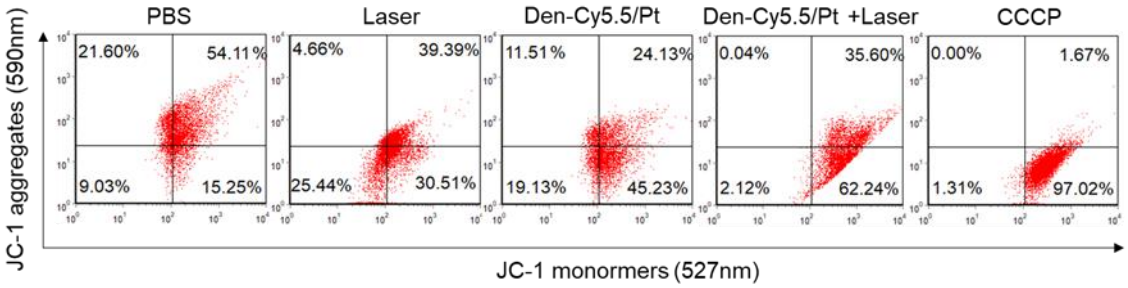

Fig. S10. Flow cytometric analyses of mitochondrial membrane potential by JC-1 assay. Green fluorescence, depolarized mitochondria (J-monomer), hyperpolarized (J-aggregates).

Figure S11

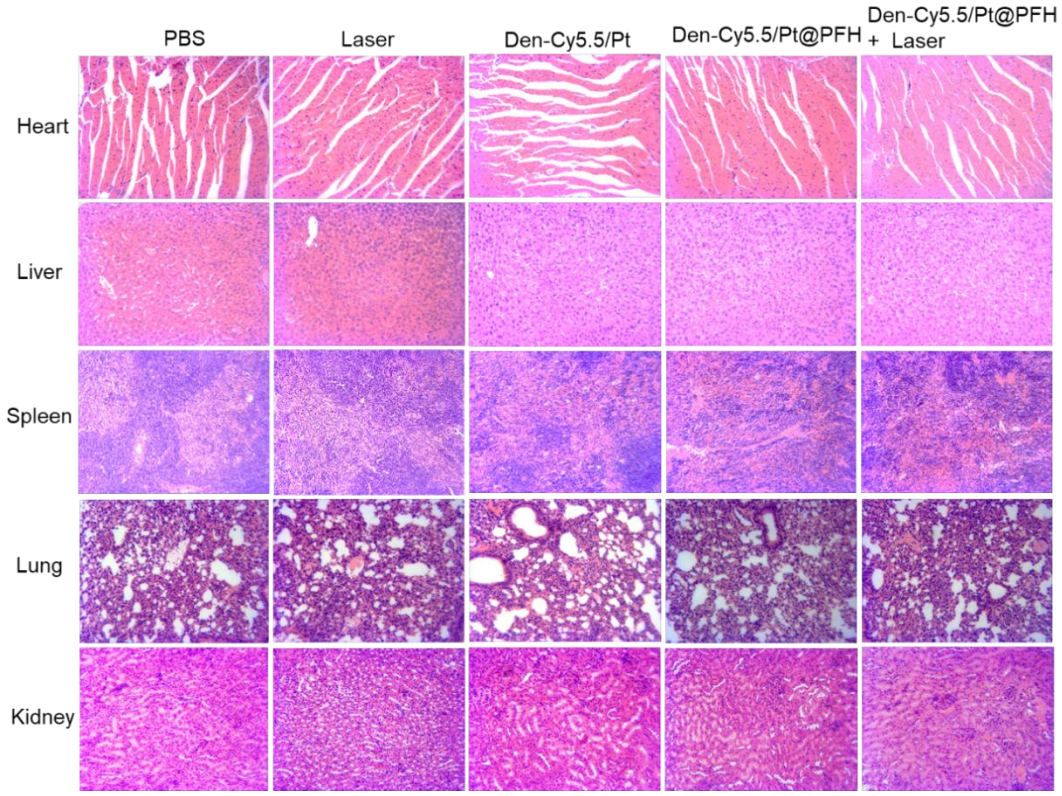

Fig. S11. H&E stains of major organ. The representative specimens were at X10 magnification. No noticeable abnormality was found in the heart, liver, spleen, lung, or kidney of various group of mice.