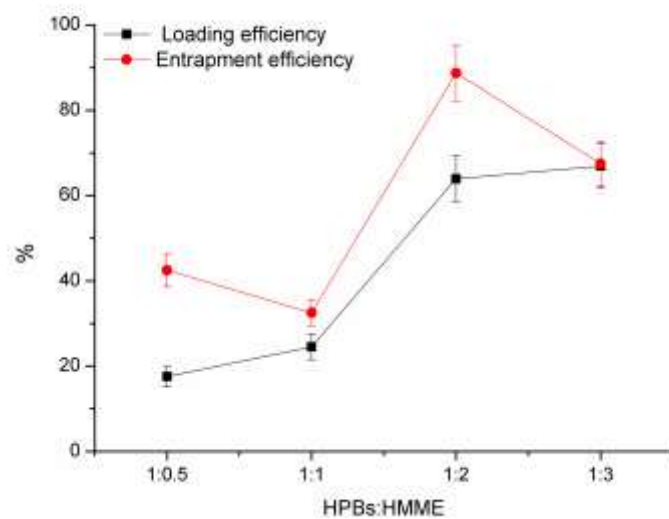
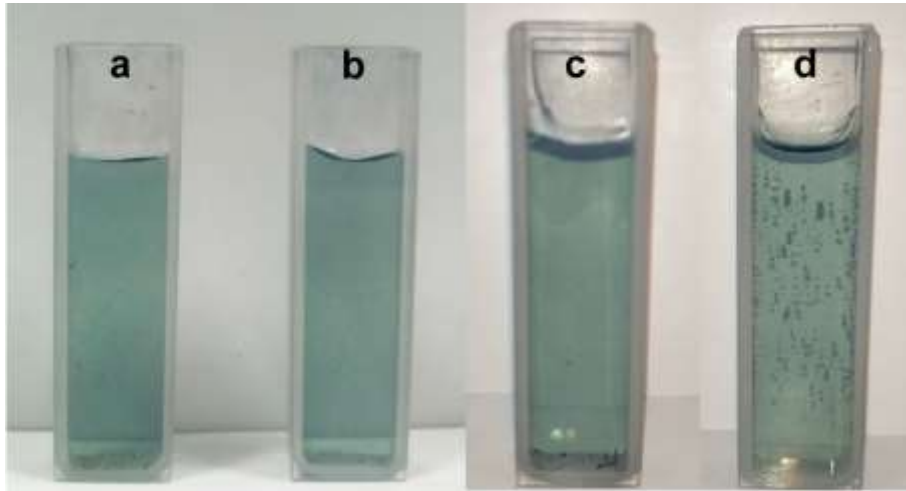


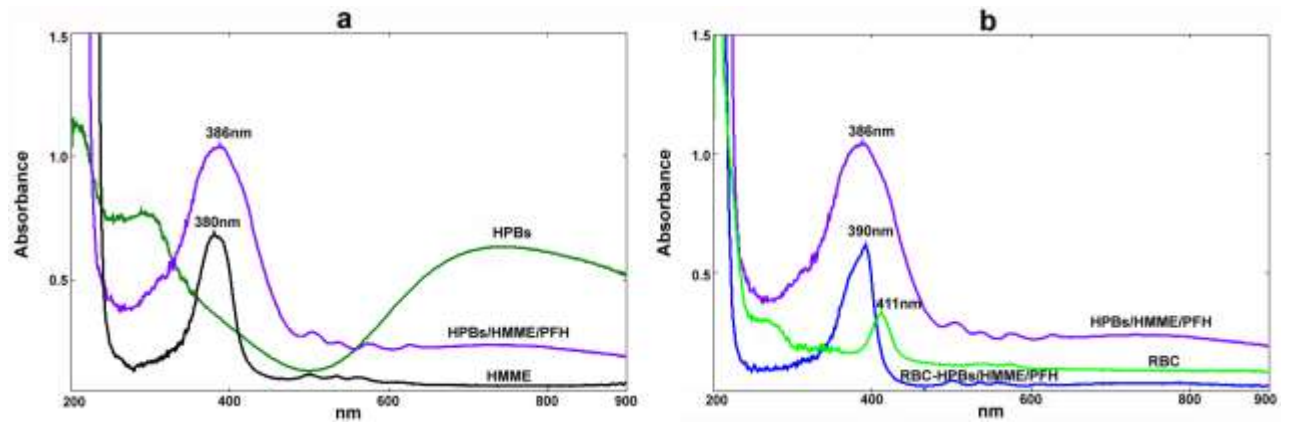
**Figure S1.** UV-vis spectrum of MPBs (a) and HPBs (b) nanoparticles



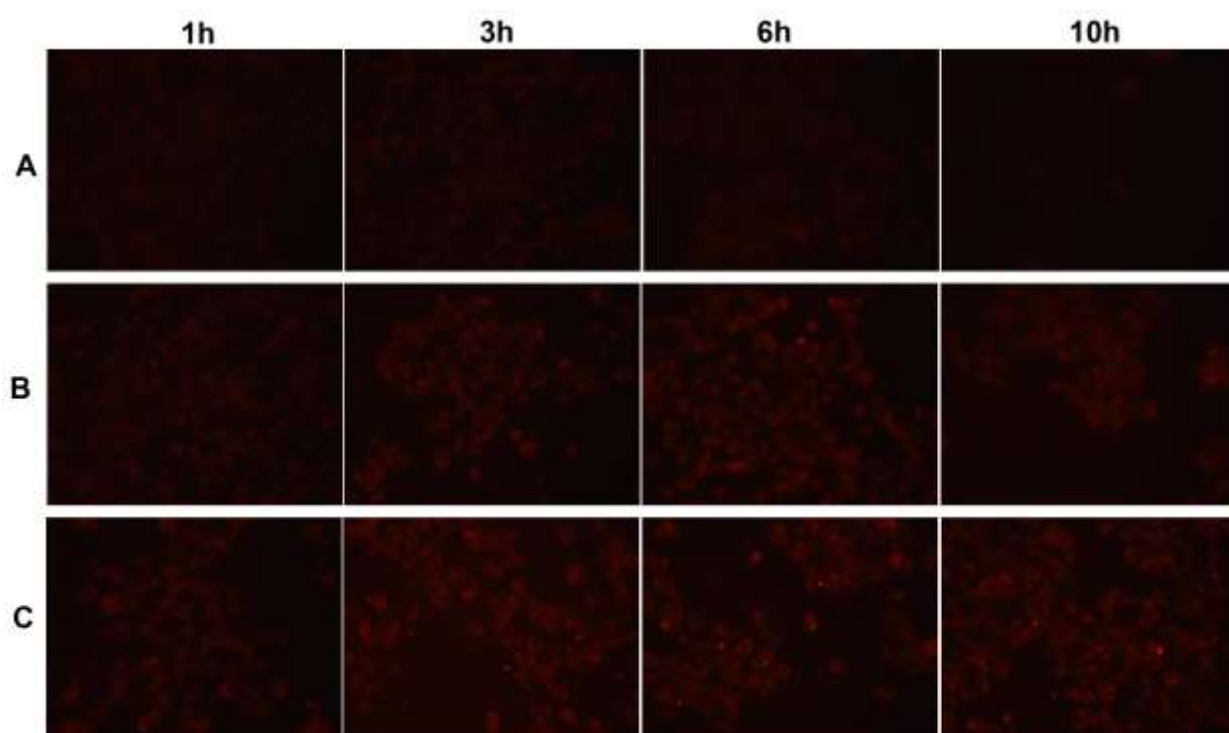
**Figure S2.** Changes in drug loading and entrapment efficiency of HPBs/HMME at different feed ratios (n =3)



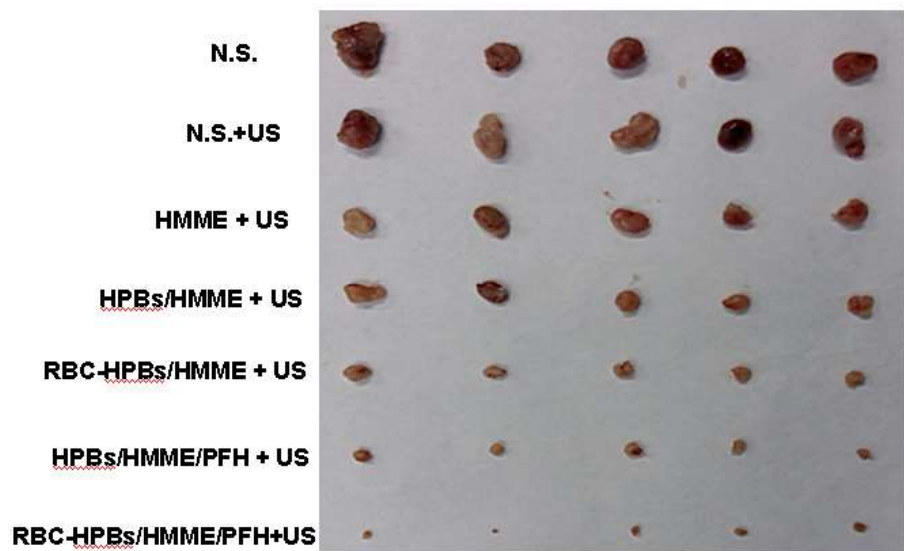
**Figure S3.** Photographs of HPBs/HMME dispersion (a), HPBs/HMME combining with US stimulation (b), PFH-loaded HPBs/HMME (c) and PFH-loaded HPBs/HMME combining with US stimulation (d). A large number of bubbles emerged in the HPBs/HMME/PFH +US group.



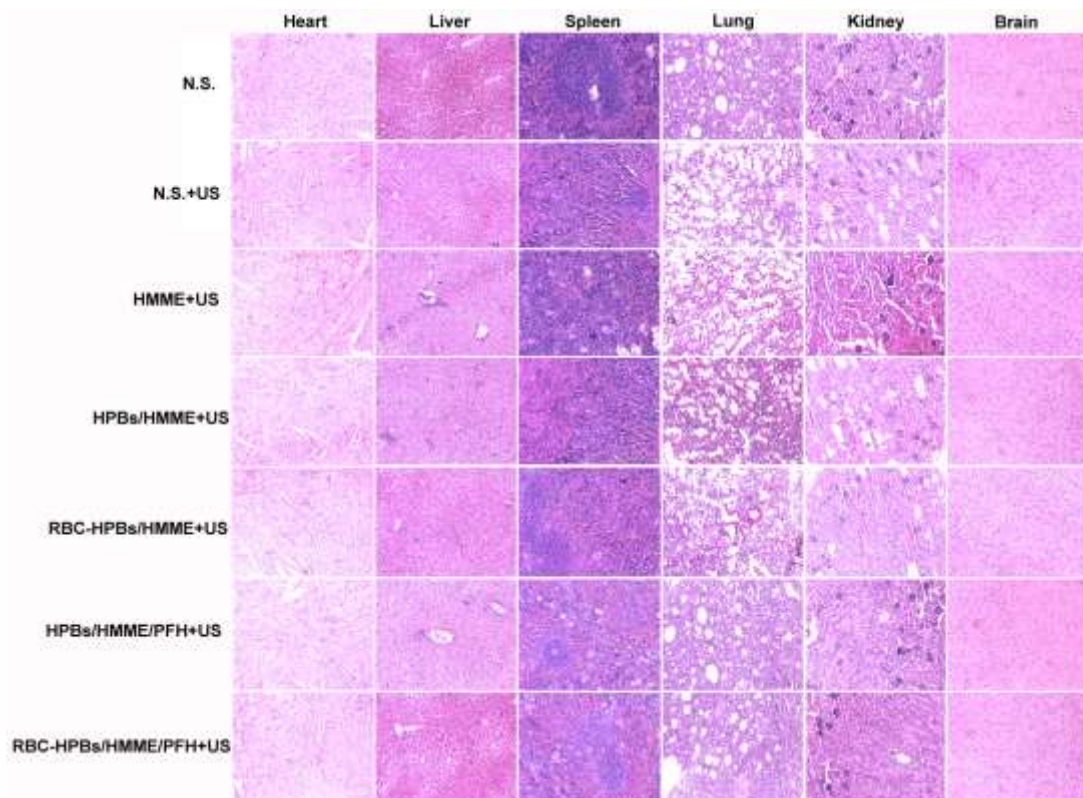
**Figure S4.** (a) UV-vis spectrum of HPBs, HMME and HPBs/HMME/PFH; (b) UV-vis spectrum of RBC, HPBs/HMME/PFH and RBC-HPBs/HMME/PFH



**Figure S5.** 4T1 Cell uptake behavior at different time points: (A) HMME; (B) HPBs/HMME/PFH; (C) RBC-HPBs/HMME/PFH



**Figure S6.** The tumor volume of various groups after treatment.



**Figure S7.** H&E staining results of heart, liver, spleen, lung, kidney and brain tissues harvested from tumor bearing mice with different treatments.