Electronic Supplementary Material (ESI) for Materials Chemistry Frontiers.

Biologically-derived nanoparticles for chemo-ferroptosis combination therapy

Haifeng Sun,[a] Zhonghe Zhang,[a] Xiaoyu Kang,[a] Qiong Dai,[a] Aixin Song,[a] Jingcheng Hao[a] and Jiwei Cui*[ab]

[a]Key Laboratory of Colloid and Interface Chemistry of the Ministry of Education, School of Chemistry and Chemical Engineering, Shandong University, Jinan, Shandong 250100, China

[b]State Key Laboratory of Microbial Technology, Shandong University, Qingdao, Shandong 266237, China

Email: jwcui@sdu.edu.cn

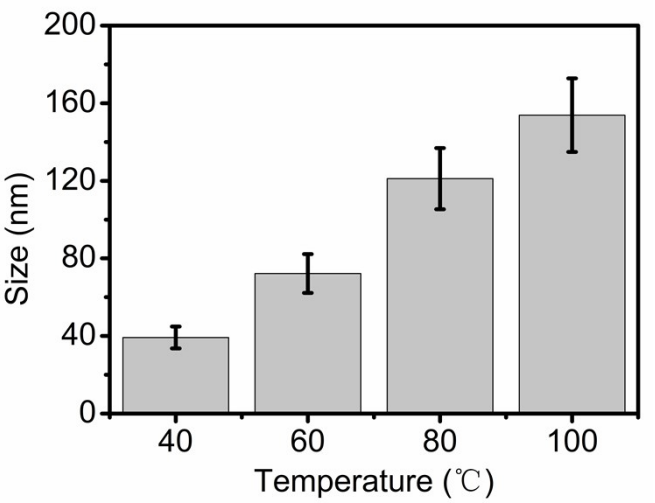

Fig. S1 The influence of heating temperature on the size changes of MBNs.

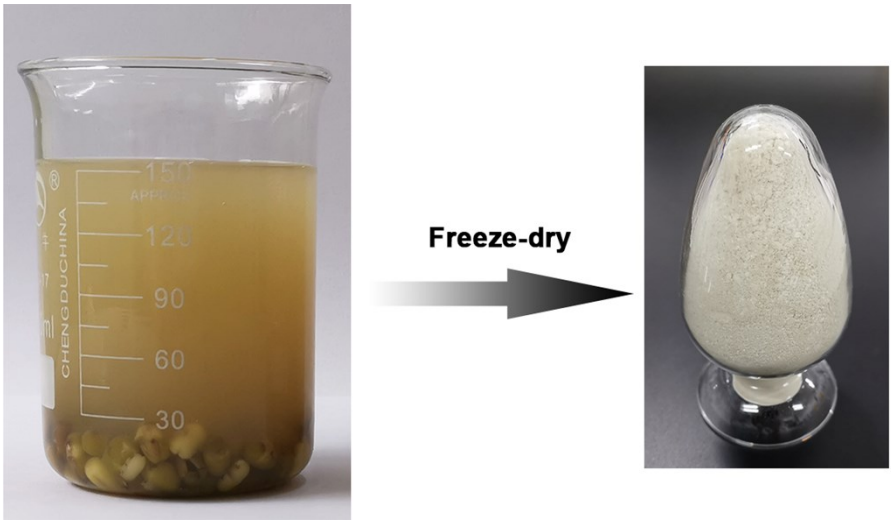

Fig. S2 Photographs of MBN suspensions and freeze-dried MBNs obtained from 150 g of MBs.

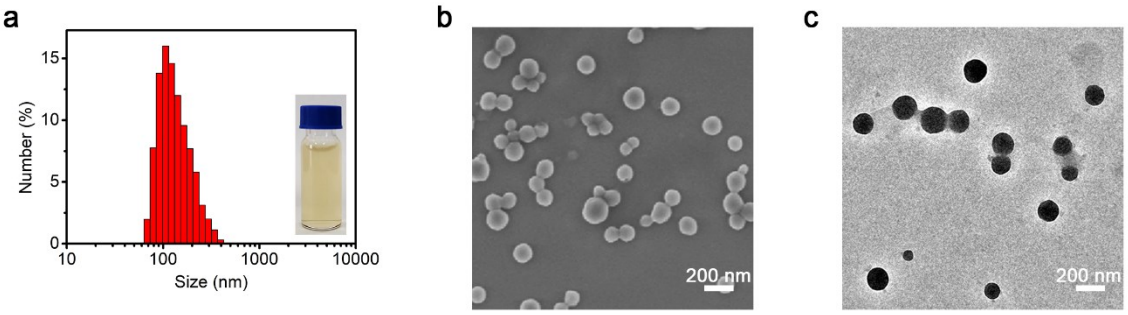

Fig. S3 (a) Size distribution, (b) SEM and (c) TEM images of redispersed MBNs. The inset in (a) is the photograph of the MBN dispersion.

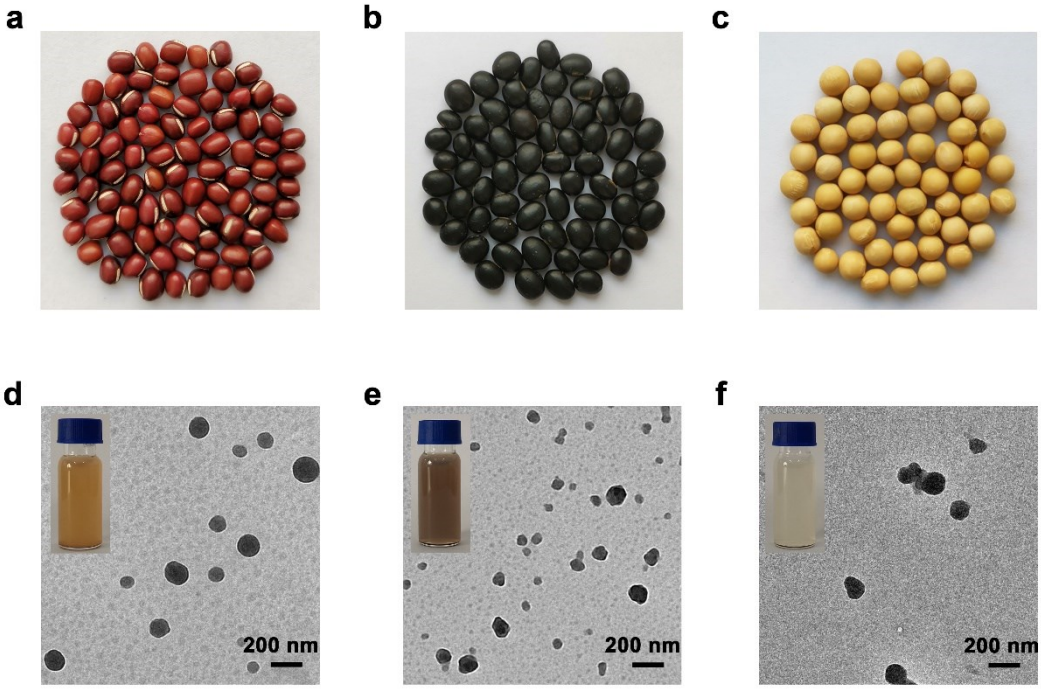

Fig. S4 Photographs of (a) ormosia, (b) black beans, and (c) soybeans as well as the corresponding TEM images (d-f) of the biologically-derived NPs. The insets in (d-f) are the photographs of the NP dispersions.

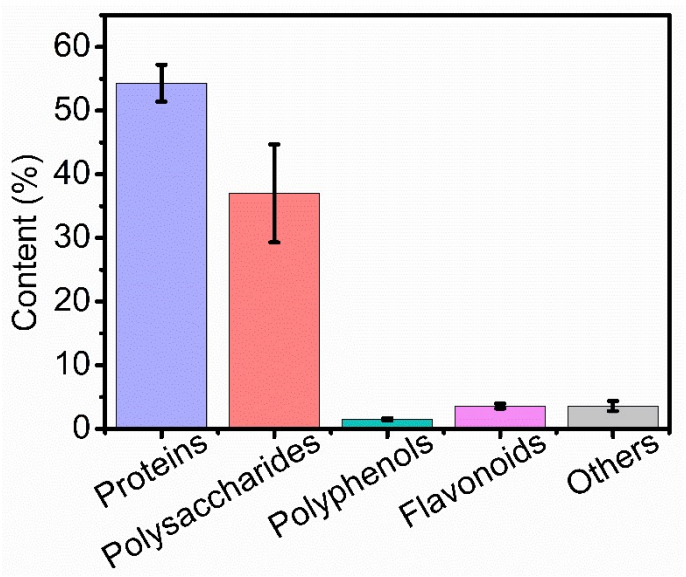

Fig. S5 Proportions of proteins, polysaccharides, polyphenols, and flavonoids in MBNs.

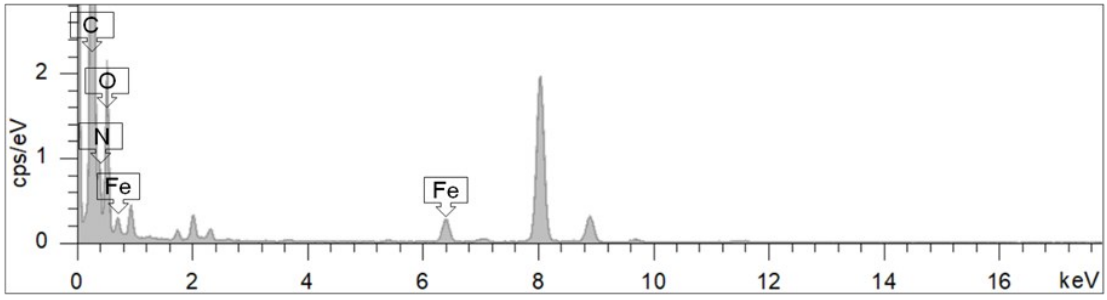

Fig. S6 EDS analysis of DOX&Fe@MBNs indicating the existence of Fe in NPs.

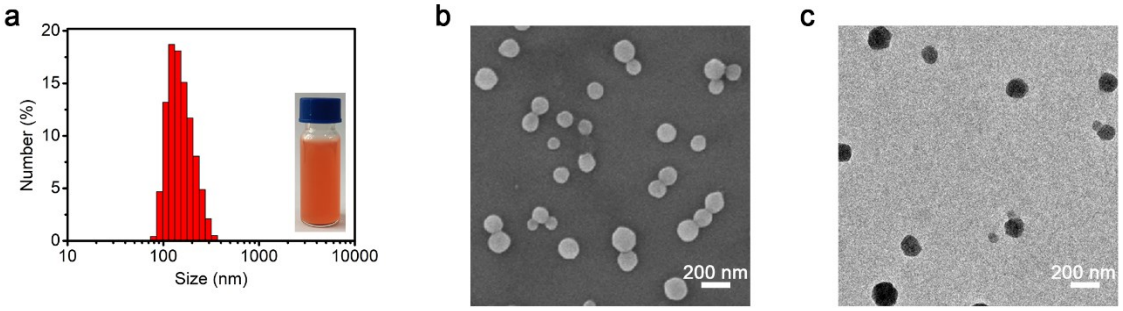

Fig. S7 (a) Size distribution, (b) SEM and (c) TEM images of DOX@MBNs. The inset in (a) is the photograph of the DOX@MBN dispersion.

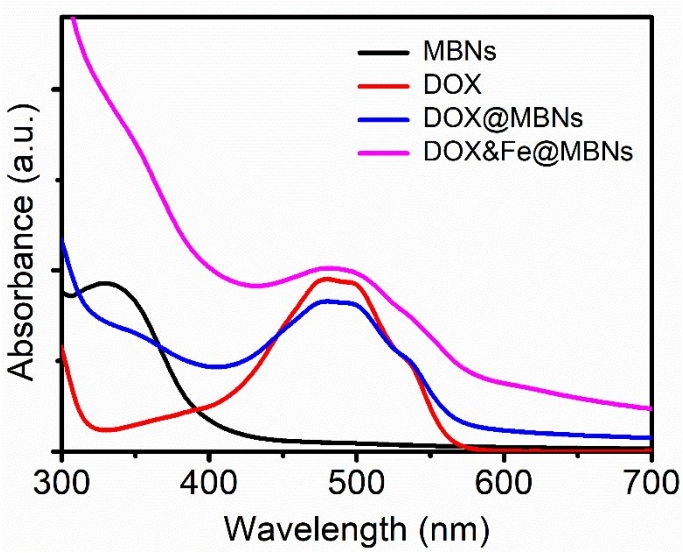

Fig. S8 UV-vis absorption spectra of MBNs, DOX, DOX@MBNs, and DOX&Fe@MBNs in water.

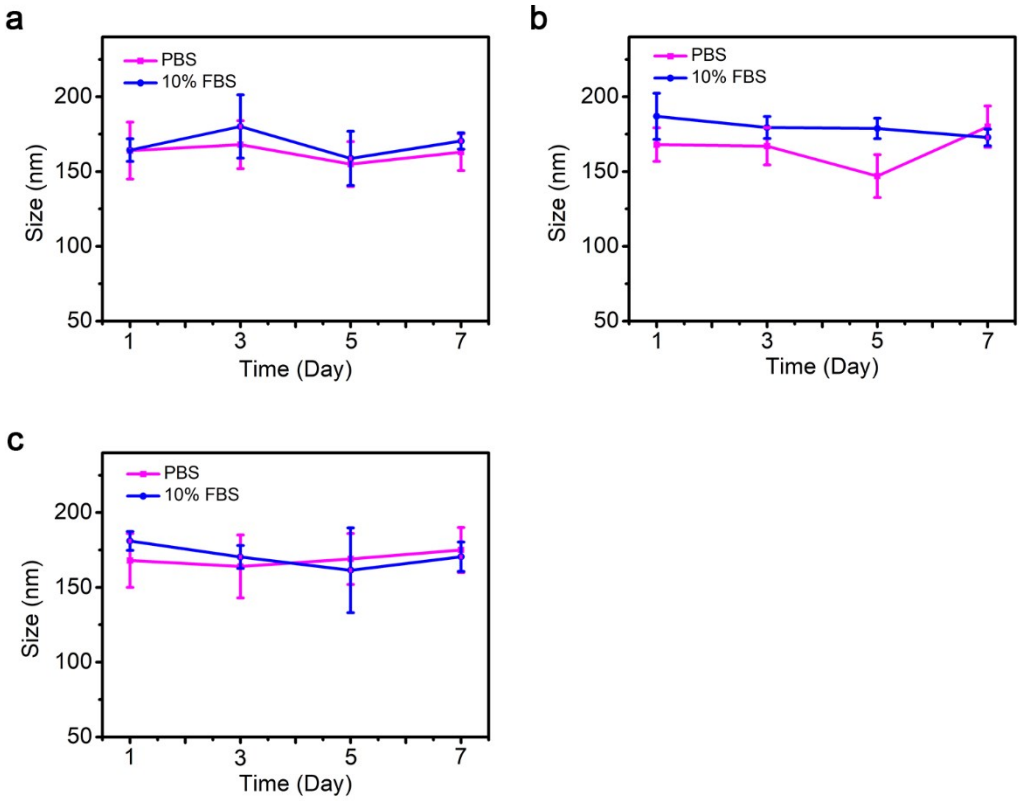

Fig. S9 NP size variations of (a) MBNs, (b) DOX@MBNs and (c) DOX&Fe@MBNs in PBS buffer (pH 7.4) and 10% FBS.

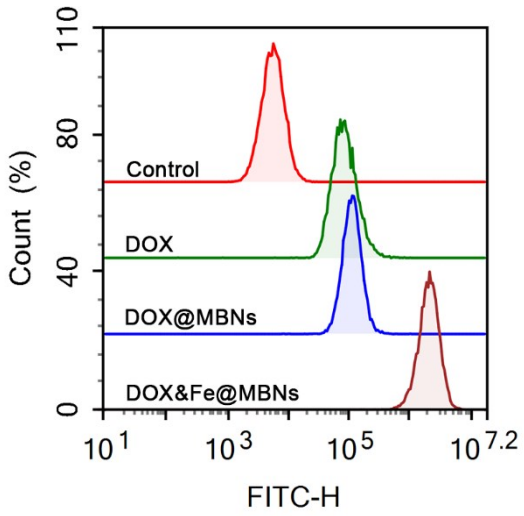

Fig. S10 Flow cytometry analysis of ROS generation after incubation with PBS (control), DOX, DOX@MBNs, and DOX&Fe@MBNs.

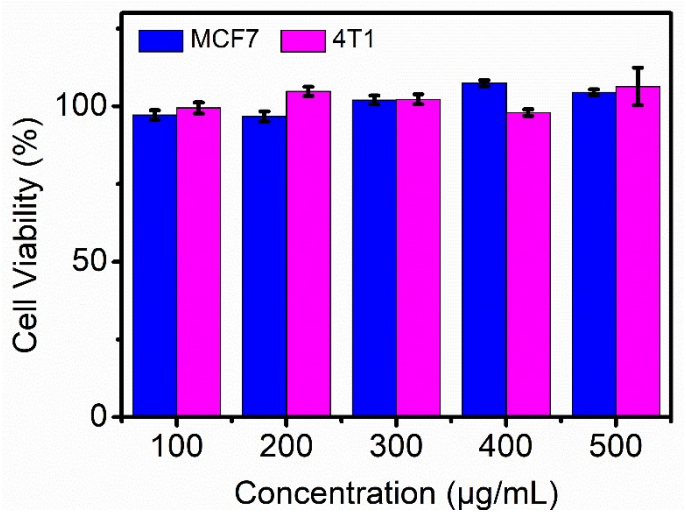

Fig. S11 Viability of MCF7 and 4T1 cells after incubation with MBNs for 24 h.

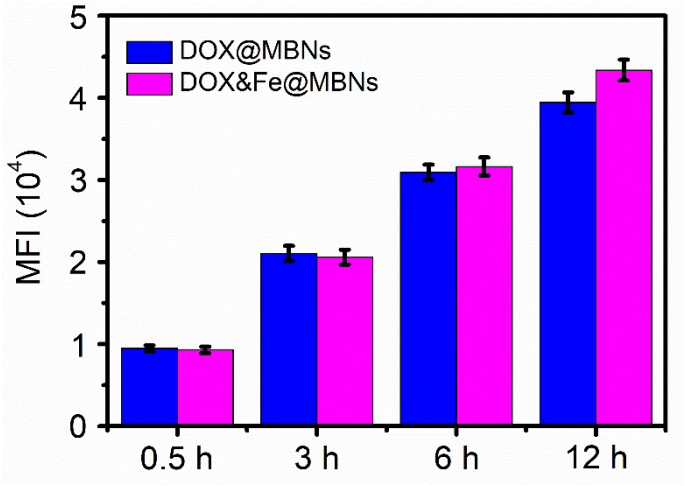

Fig. S12 MFI of MCF7 cells after incubation with DOX@MBNs and DOX&Fe@MBNs.

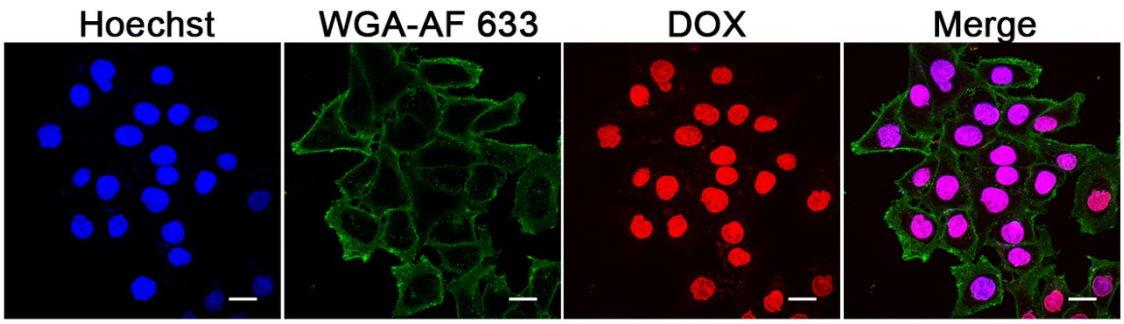

Fig. S13 CLSM images of MCF7 cells after incubation with DOX@MBNs for 12 h. Nuclei and cytomembrane were stained with Hoechst 33342 and WGA-AF633 (green pseudo color), respectively. Scale bars are 25 μm.

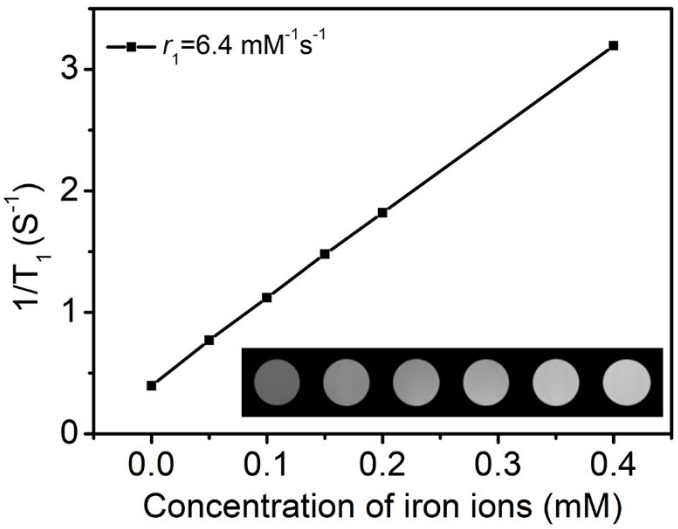

Fig. S14 T_1 relaxation rate of DOX&Fe@MBNs. The inset is the T_1-weighted MR images of DOX&Fe@MBNs with different concentration of iron ions.

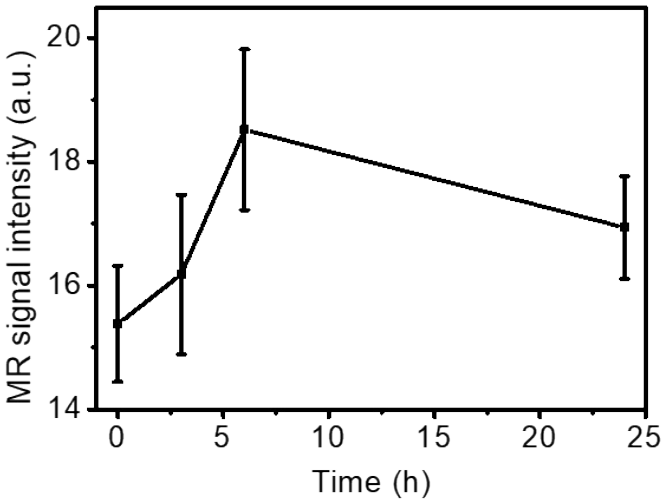

Fig. S15 Variation of MR signal intensity at the tumor site at different time points.

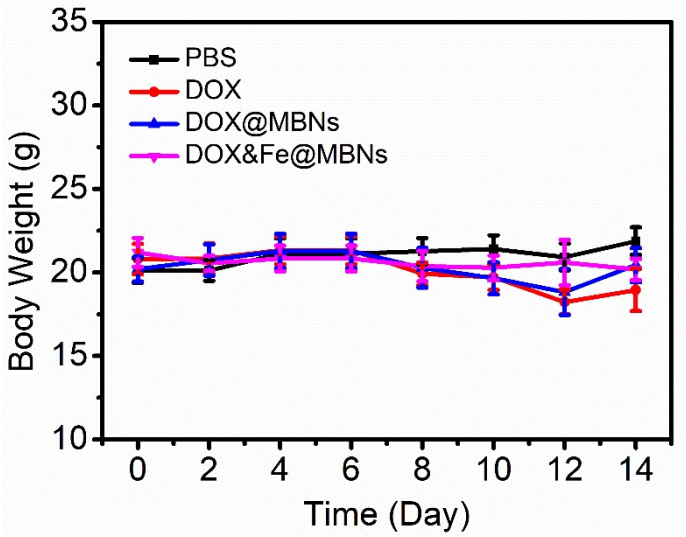

Fig. S16 Body weight changes of the tumor-bearing mice during the treatment.

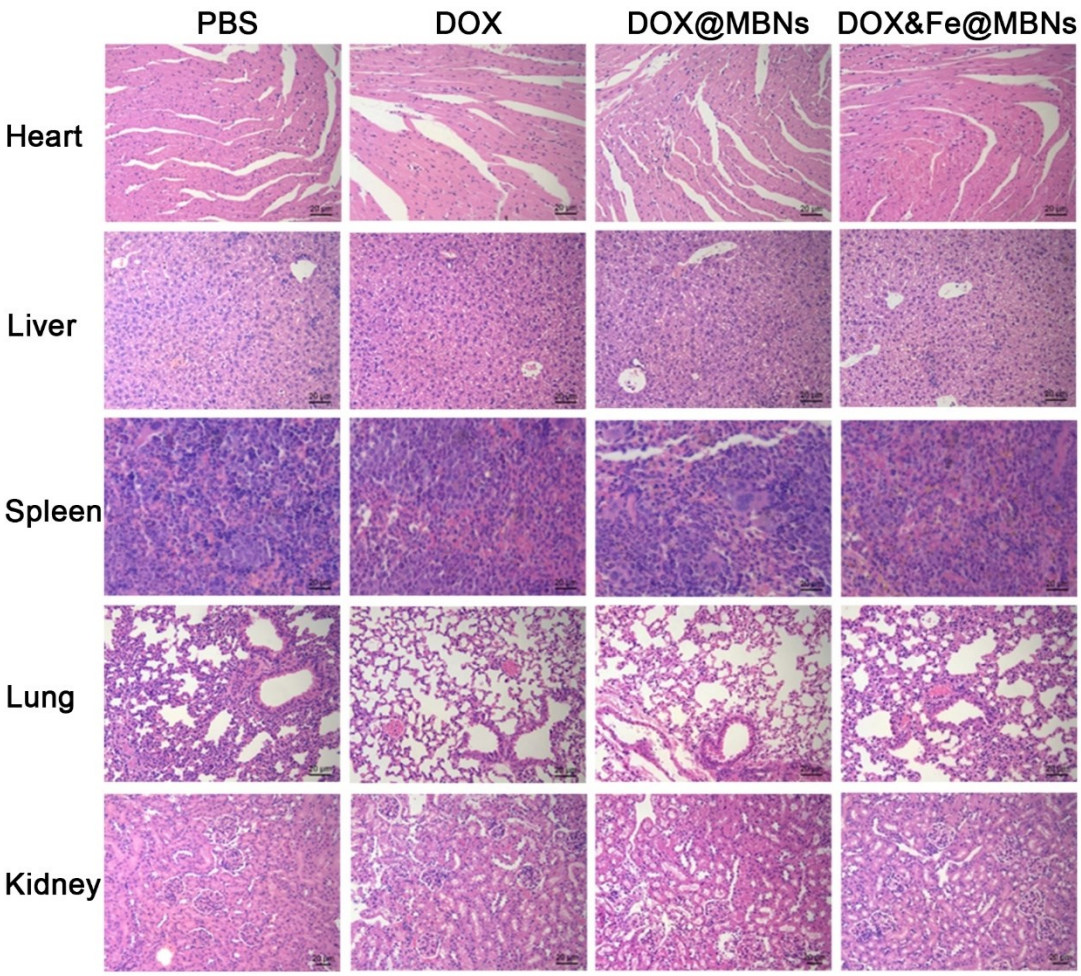

Fig. S17 H&E staining of the major organs (i.e., heart, liver, spleen, lung, and kidney) after different treatments for 14 days.