

## Supporting Information

### **A hypoxia-activated and tumor microenvironment-remodeling nanoplatforM for augmenting sonodynamic-chemodynamic- chemotherapy of breast cancer**

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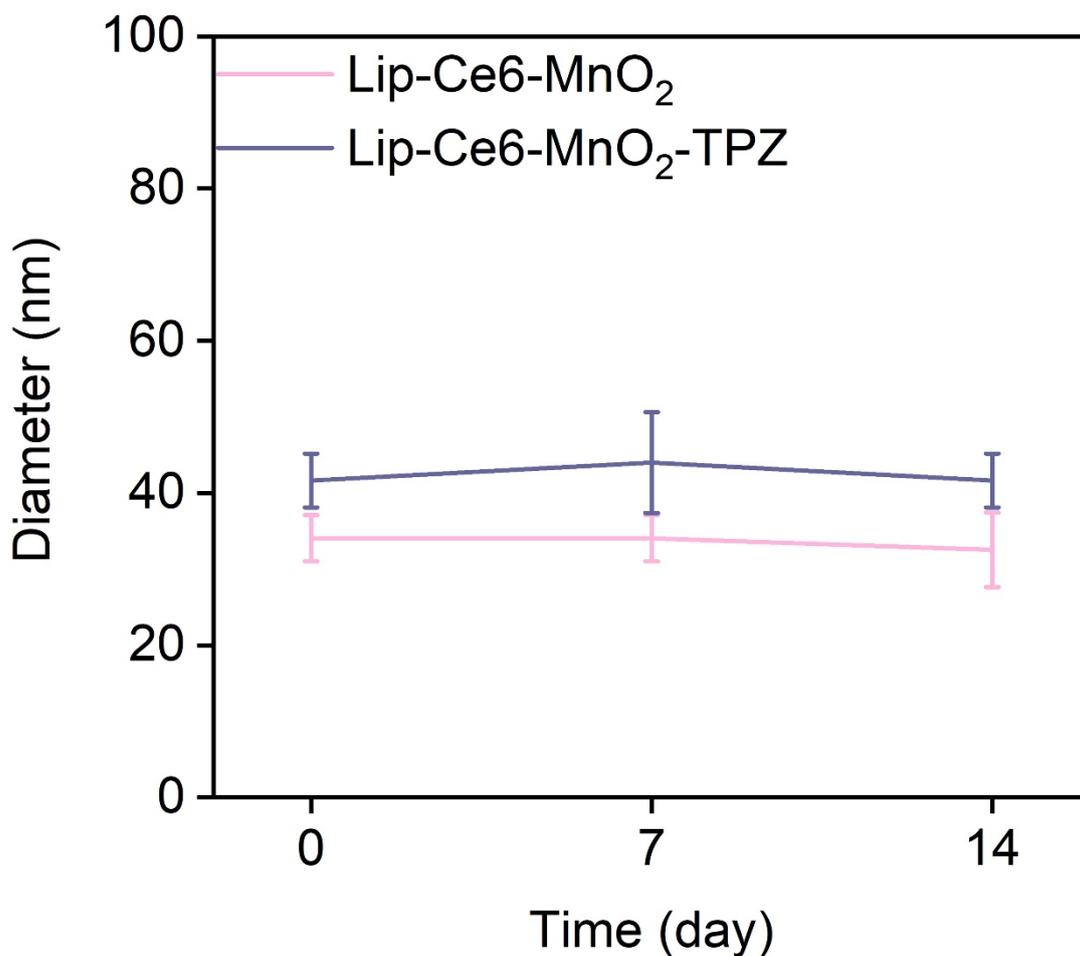
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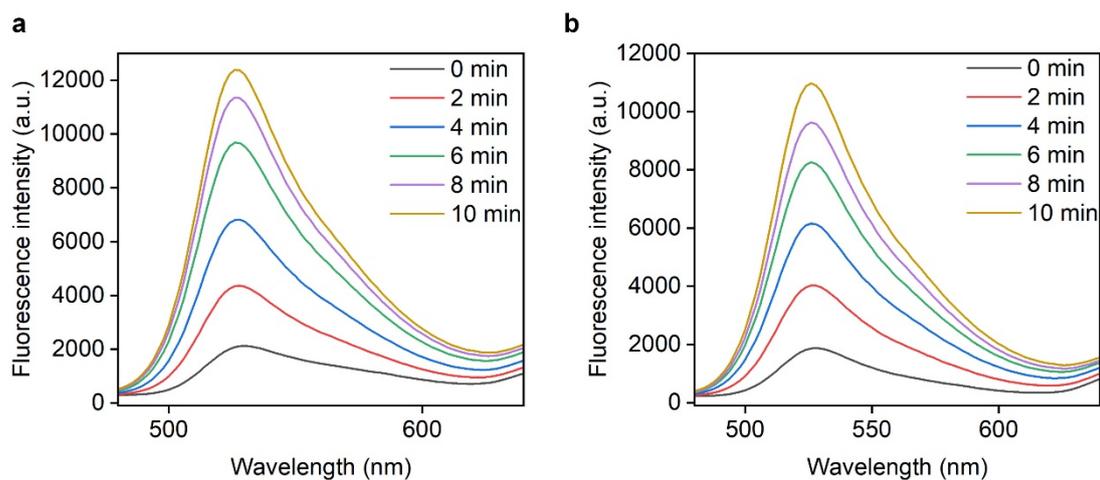
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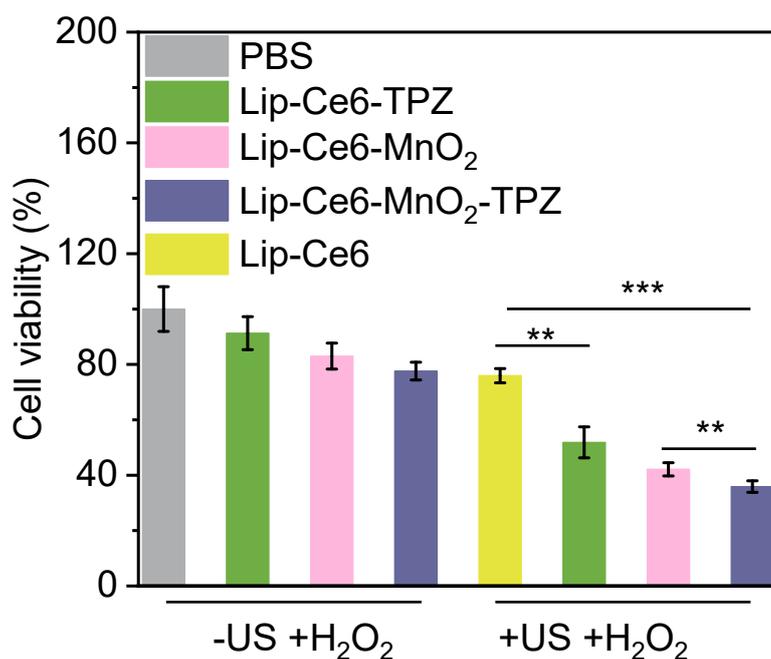
*# These authors equally contributed to this work.*



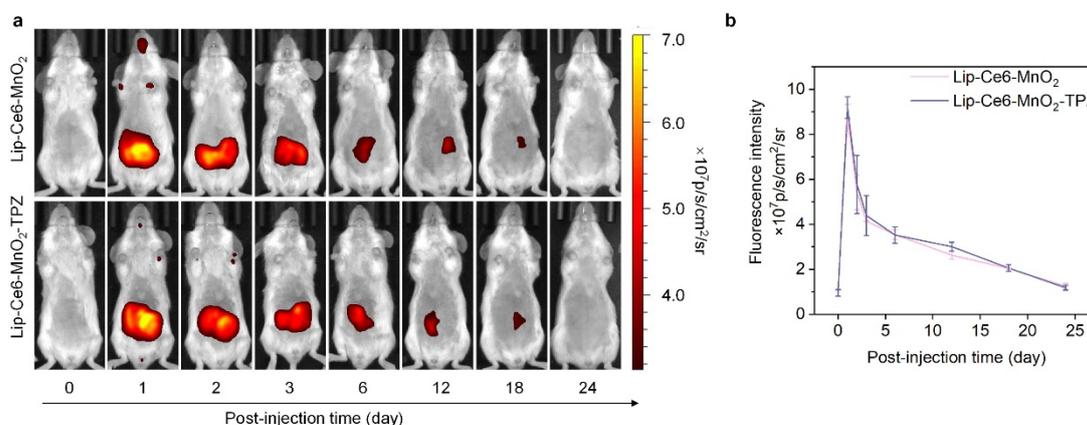
**Fig. S1** Stability evaluation of Lip-Ce6-MnO<sub>2</sub> and Lip-Ce6-MnO<sub>2</sub>-TPZ in aqueous solutions at different days (n = 3). Mean  $\pm$  SD are presented in data.



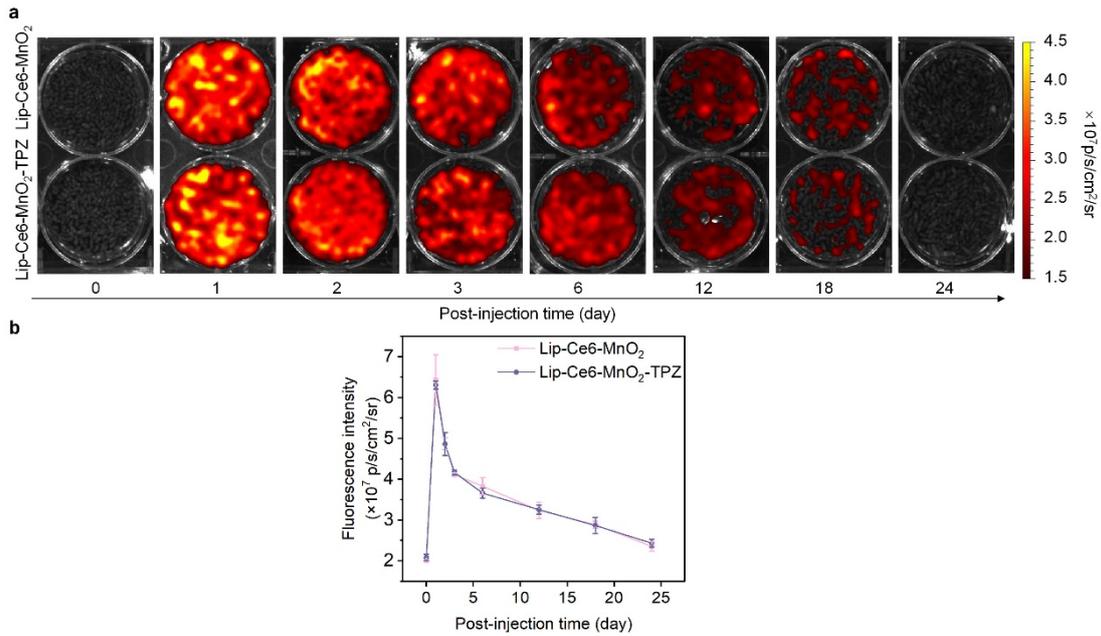
**Fig. S2** Fluorescence spectra of SOSG solutions containing (a) Lip-Ce6-MnO<sub>2</sub>, (b) Lip-Ce6-MnO<sub>2</sub>-TPZ (10  $\mu$ g/mL) under US irradiation for different times.



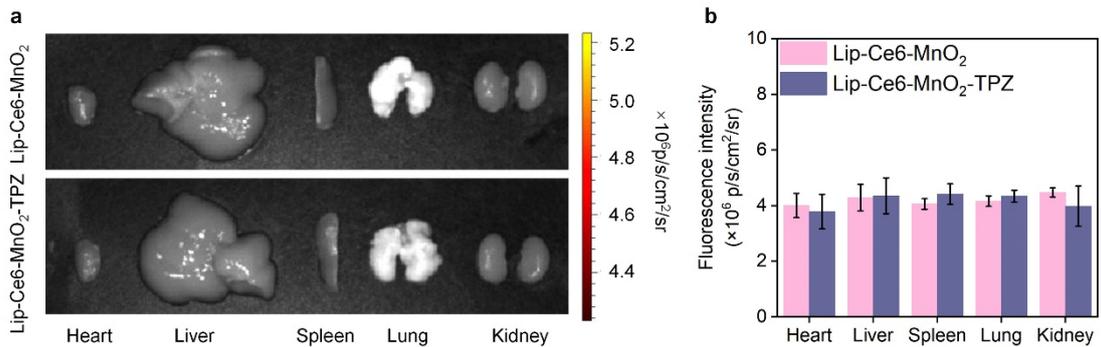
**Fig. S3** Cell viability of 4T1 cancer cells after incubation with Lip-Ce6, Lip-Ce6-TPZ, Lip-Ce6-MnO<sub>2</sub> and Lip-Ce6-MnO<sub>2</sub>-TPZ for 24 h (n = 3). Mean ± SD are presented in data.



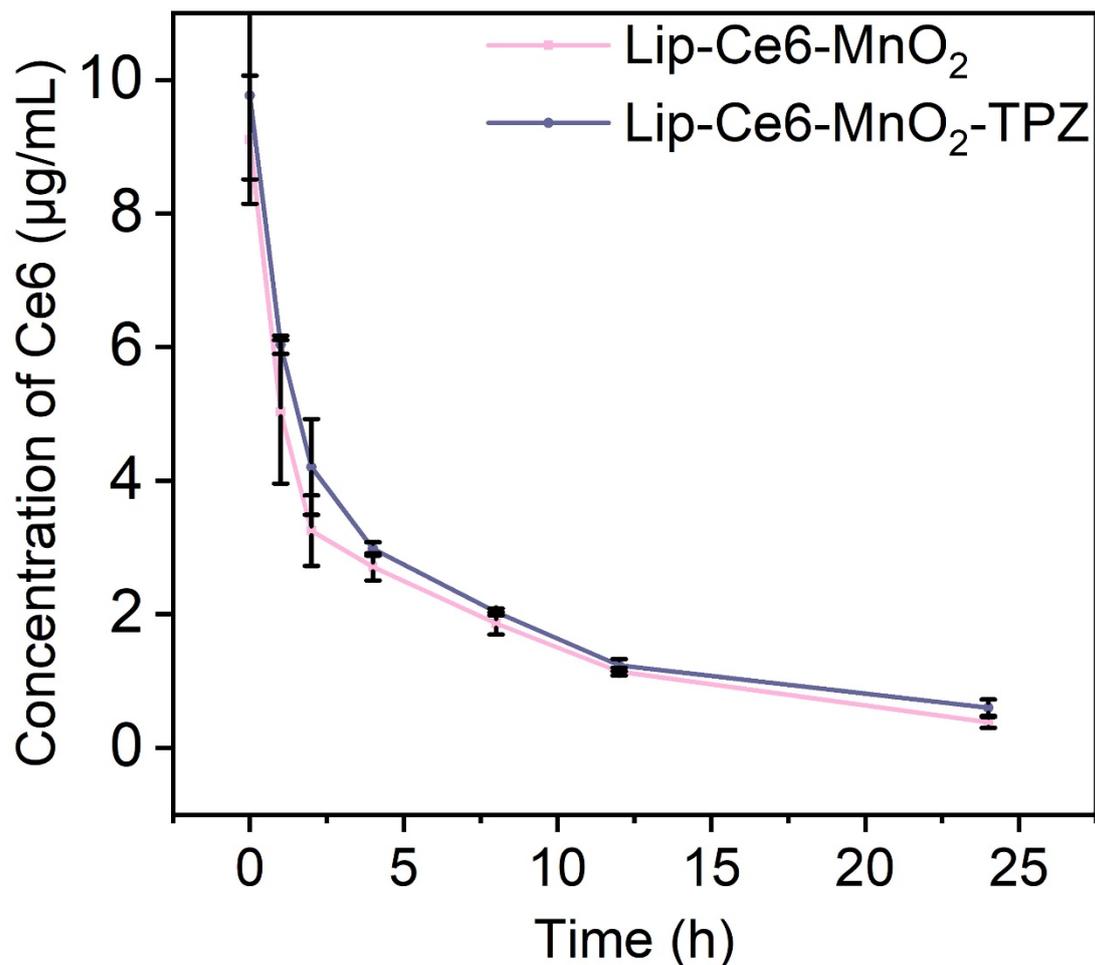
**Fig. S4** (a) In vivo fluorescence images of mice after systemic administrations of Lip-Ce6-MnO<sub>2</sub> and Lip-Ce6-MnO<sub>2</sub>-TPZ at different post-injection time points. (b) Quantification of fluorescence intensities of liver in living mice (n = 3). Mean ± SD are presented in data.



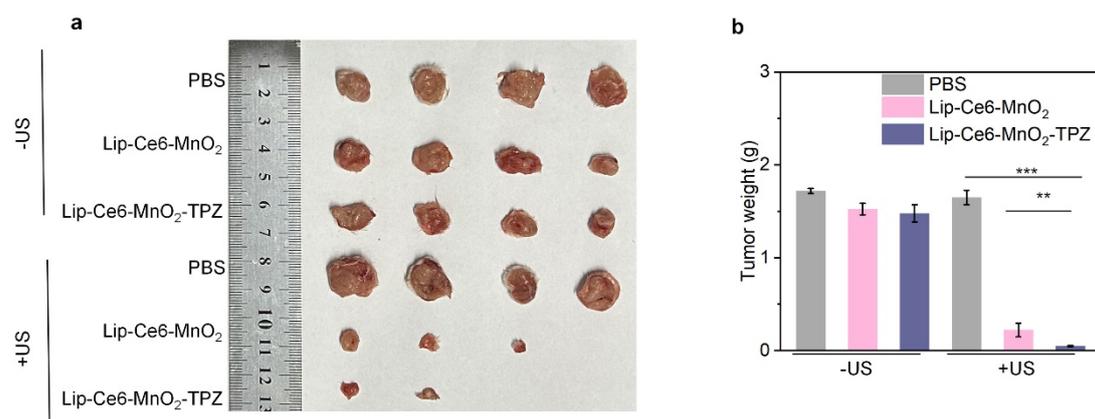
**Fig. S5** (a) Fluorescence images of faeces from mice after systemic administration of Lip-Ce6-MnO<sub>2</sub> and Lip-Ce6-MnO<sub>2</sub>-TPZ at different post-injection time points. (b) Quantification of fluorescence intensities of faeces (n = 3). Mean ± SD are presented in data.



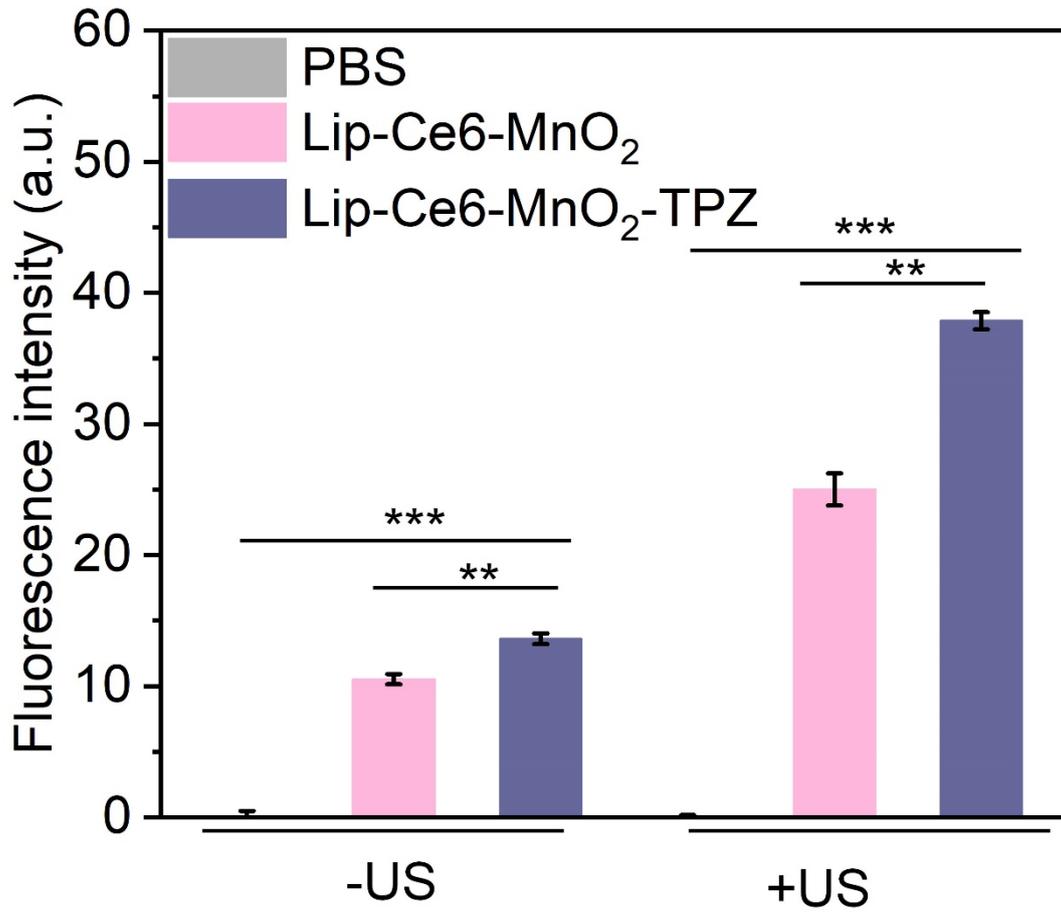
**Fig. S6** (a) Fluorescence images of heart, liver, spleen, lung, and kidney from Lip-Ce6-MnO<sub>2</sub> and Lip-Ce6-MnO<sub>2</sub>-TPZ injected mice after 24 days of administration. (b) Quantification of fluorescence intensities of main organs (n = 3). Mean ± SD are presented in data.



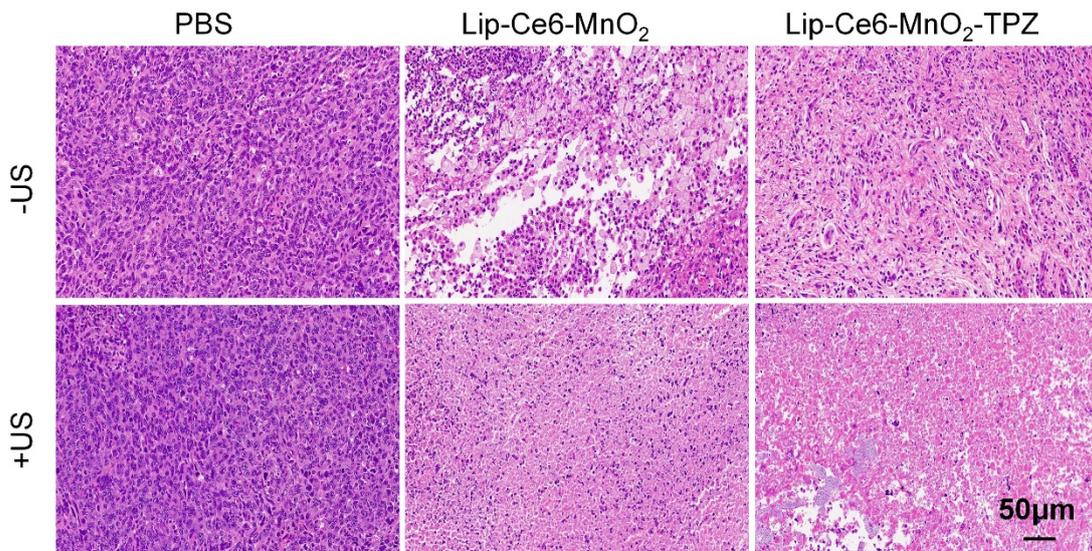
**Fig. S7** Pharmacokinetic profiles of Lip-Ce6-MnO<sub>2</sub> and Lip-Ce6-MnO<sub>2</sub>-TPZ after systemic administration (n = 3).



**Fig. S8** (a) The tumor photographs in various treatment groups. (b) Weights of 4T1 tumors after treatments (n = 4).



**Fig. S9.** Quantitative green fluorescence intensity of H<sub>2</sub>DCFDA-treated tumor tissues after different treatments (n = 5).



**Fig S10.** H&E staining images of 4T1 tumors in different treatment groups.