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## Supporting information

## Microenvironment-mediated Cu<sub>2</sub>O-MoS<sub>2</sub> nanoplatform with enhanced Fenton-like

## reaction activity for tumor Chemodynamic/photothermal therapy

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**Fig S1.** (a, b) Particle size distribution of  $MoS_2$  and  $Cu_2O-MoS_2$ . (n = 3, mean ± SD).



Fig S2. EDS spectrum of Cu<sub>2</sub>O-MoS<sub>2</sub>.



Fig S3. Zeta potential of MoS<sub>2</sub> and Cu<sub>2</sub>O-MoS<sub>2</sub>.



Fig S4. (a) Low-resolution TEM image of MoS<sub>2</sub>. (b) Low-resolution TEM image of Cu<sub>2</sub>O-MoS<sub>2</sub>.



Fig S5. UV-vis absorption spectra of MoS<sub>2</sub> and Cu<sub>2</sub>O-MoS<sub>2</sub>.



Fig S6. FT-IR spectra of PVP, MoS<sub>2</sub> and PVP-MoS<sub>2</sub>.



**Fig S7.** (a) XPS survey spectrum of  $MoS_2$ . (b) High resolution of Mo XPS images of  $MoS_2$ . (c) High resolution of S XPS images of  $Cu_2O-MoS_2$ . (d) High resolution of Mo XPS images of  $Cu_2O-MoS_2$ .



**Fig S8.** Cu<sub>2</sub>O-MoS<sub>2</sub> UV-vis absorption spectra of different concentrations.



Fig S9. Photographs of  $Cu_2O$ -MoS<sub>2</sub> incubated for 48 h under different physiological conditions.



Fig S10. Cell viability of 293A cells exposed to  $Cu_2O$ -MoS<sub>2</sub> at different concentrations.



Fig S11. Toxicity of the same concentration of  $Cu_2O-MoS_2$  to 4T1 breast cancer cells under  $H_2O_2$  or





Fig S12. Temperature curves of Cu<sub>2</sub>O-MoS<sub>2</sub> aqueous solution under 808 nm laser.



Fig S13. Fluorescence imaging of JC-1 stained 4T1 cells.