

Supplementary materials

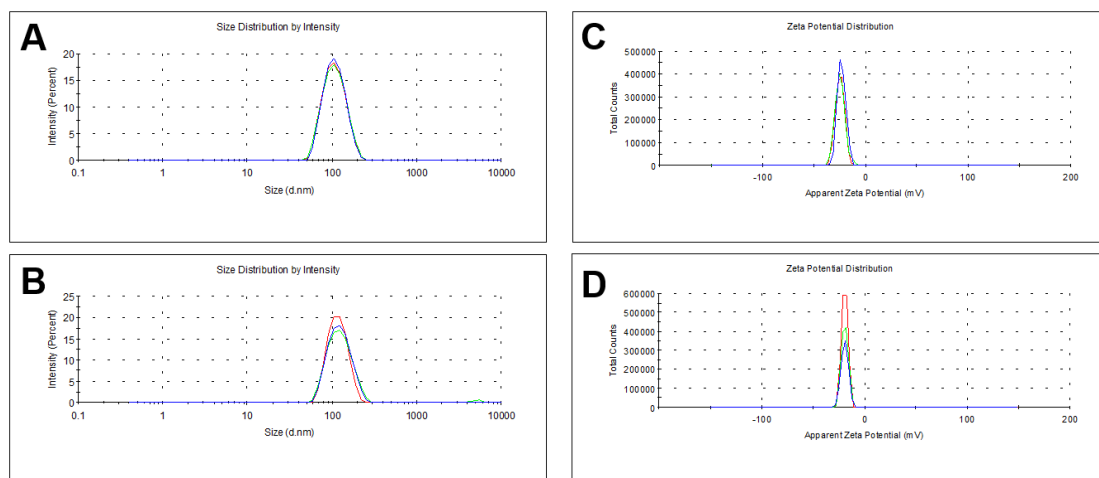


Figure S1. Particle sizes of MnMSN (A) and FaPEG-MnMSN (B). Zeta potentials of MnMSN (C) and FaPEG-MnMSN (D).

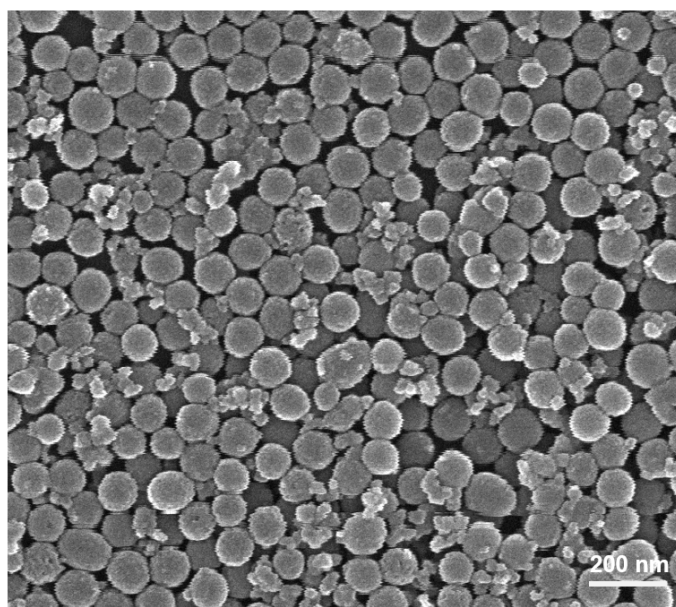


Figure S2. SEM image of FaPEG-MnMSN.

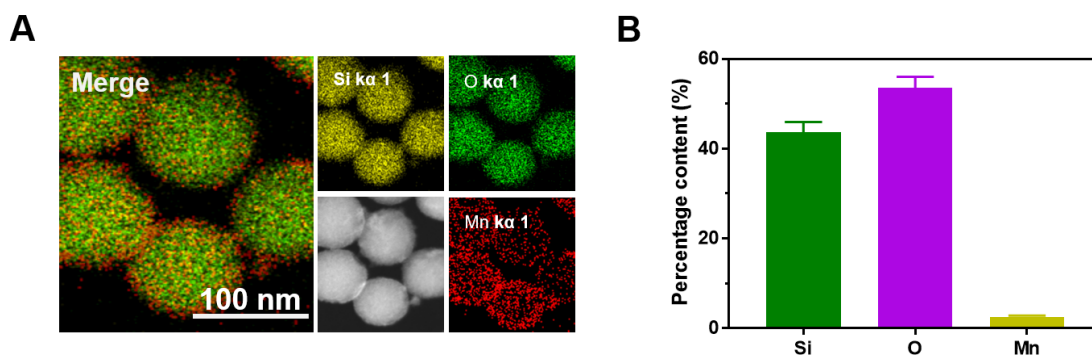


Figure S3. Element mappings (A) and Percentage content (B) of Si, O, and Mn in MnMSN.

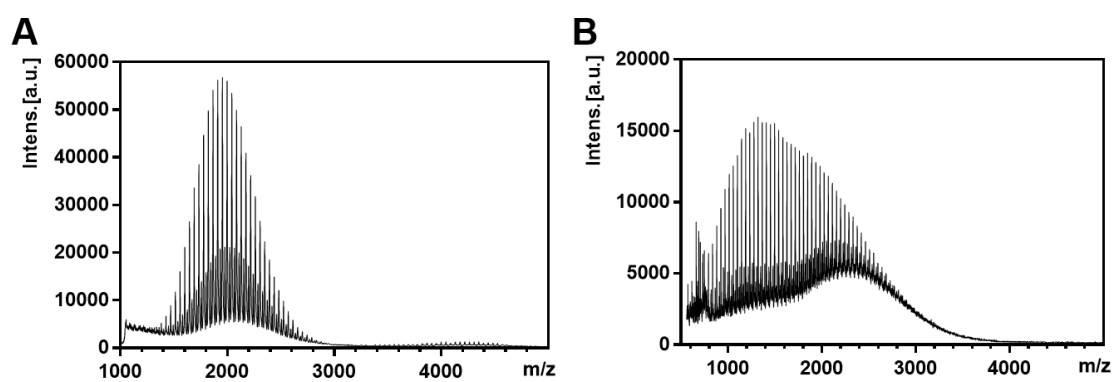


Figure S4. MOLDI-TOF-MS spectrum of mPEG-saline (A) and FaPEG-saline (B).

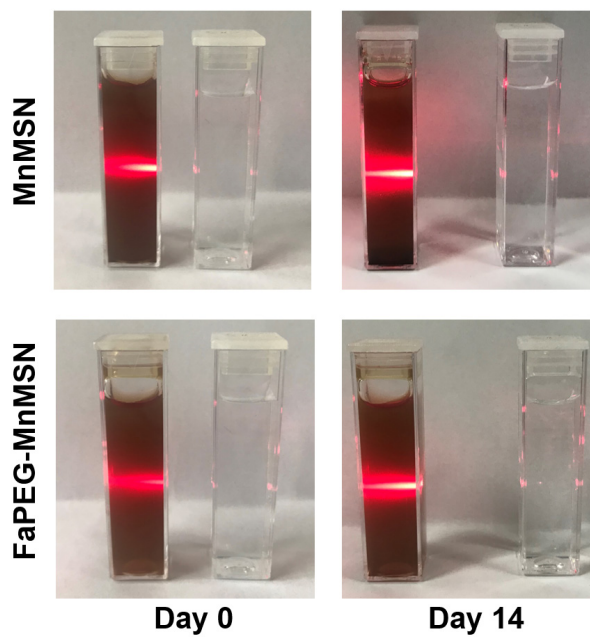


Figure S5. The Tyndall phenomenon of MnMSN and FaPEG-MnMSN during 14 days.

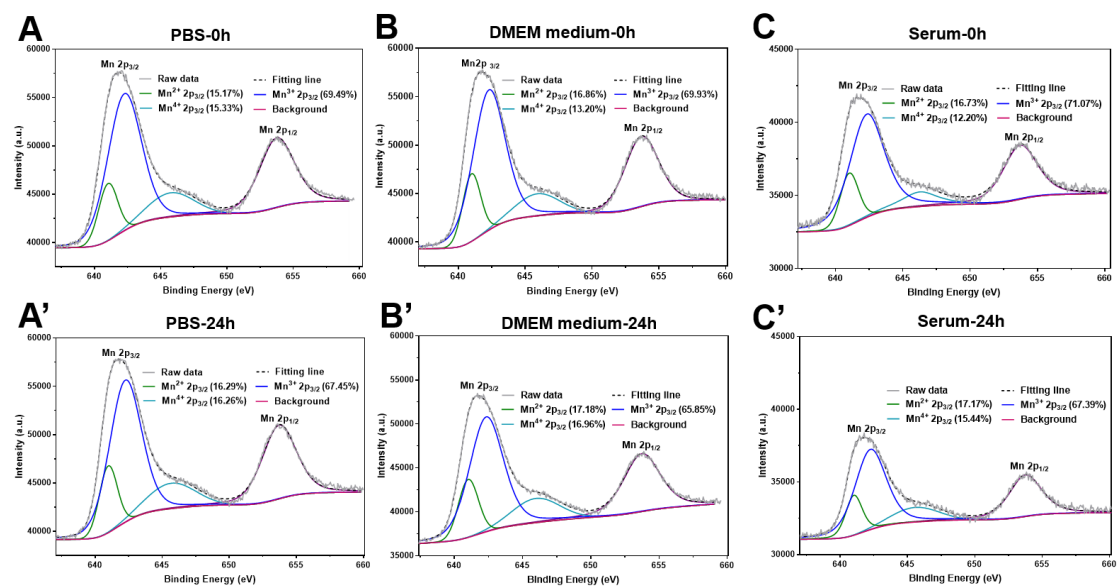


Figure S6. The valence changes of Mn ions in FaPEG-MnMSN at various physiological conditions during 24 h.

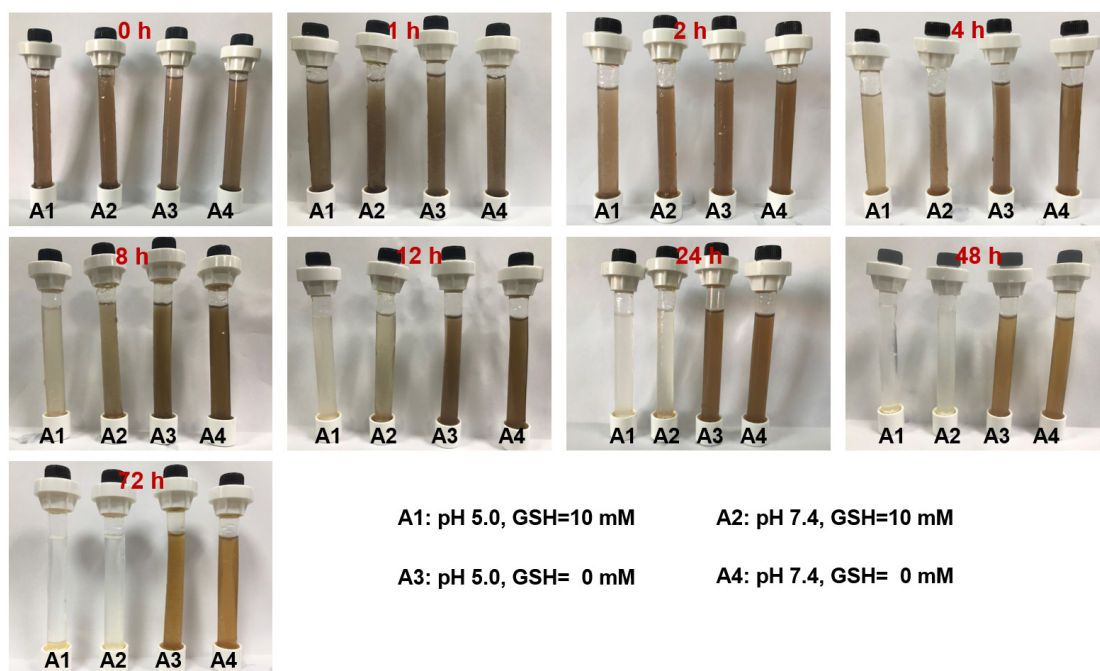


Figure S7. Color changes of FaPEG-MnMSN dispersion during the degradation under different GSH and pH conditions.

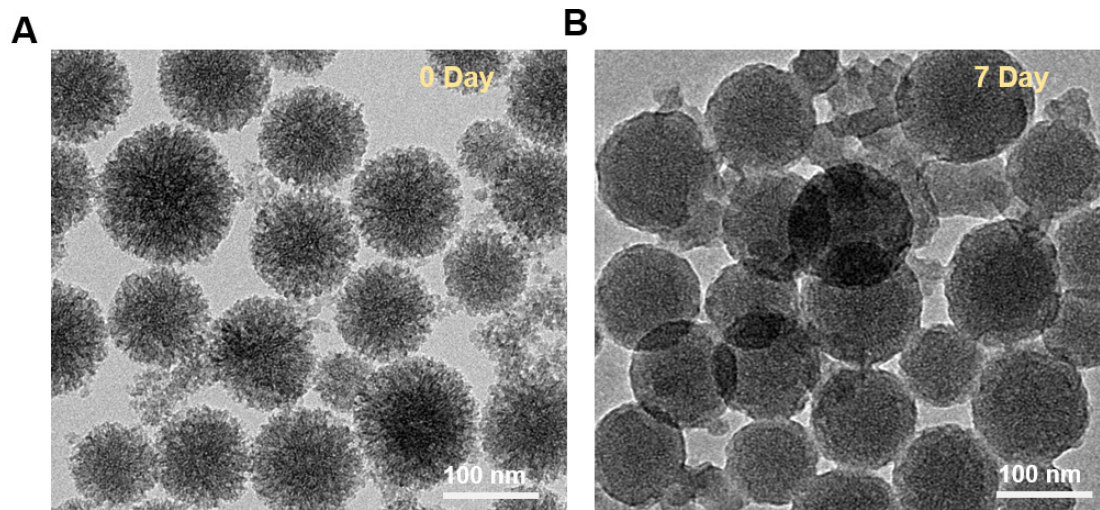


Figure S8. The degradation of FaPEG-MnMSN for 7 days under physiological environment.

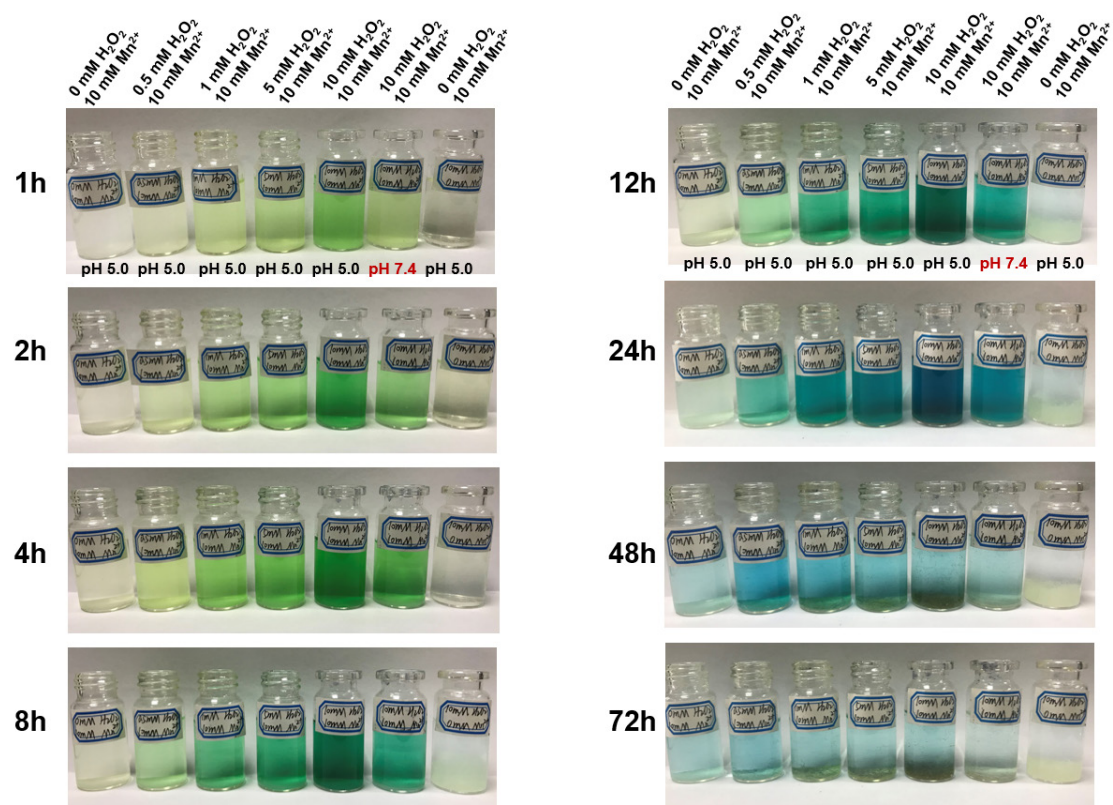


Figure S9. The color changes of Mn^{2+} and H_2O_2 after incubation with TMB for different times.

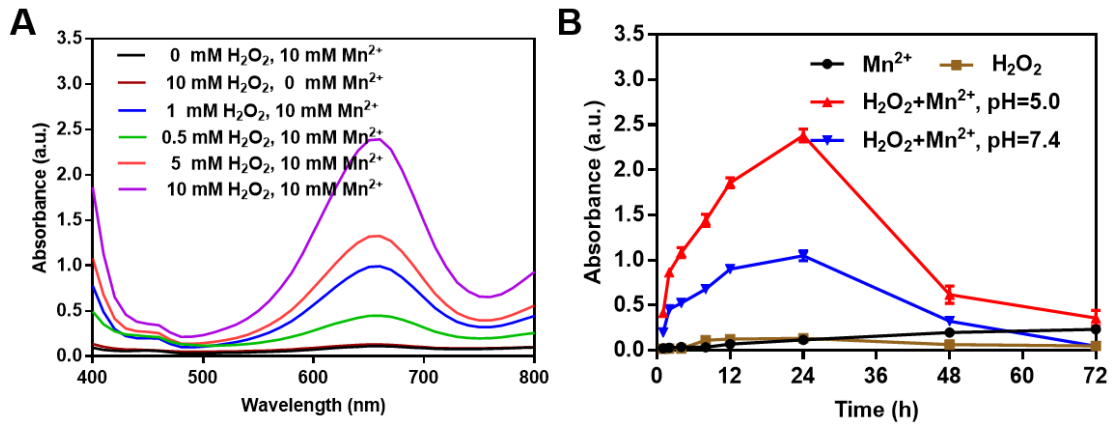


Figure S10. UV-vis spectra of TMB solutions after co-incubation for 24 h with different concentrations of H₂O₂ and Mn²⁺ (A). Absorbance changes of TMB solution incubated with H₂O₂ and Mn²⁺ during 72 h (B).

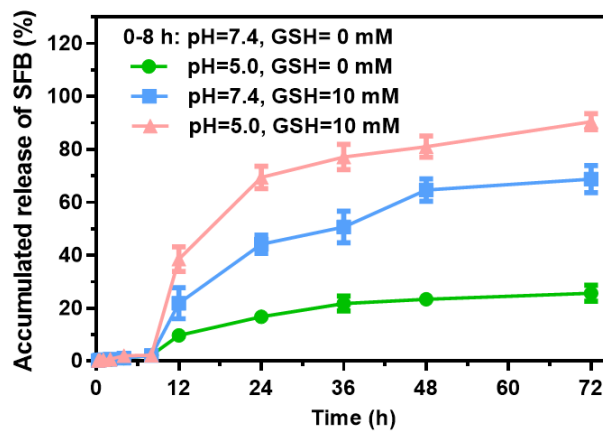


Figure S11. *In vitro* release profile of MnMSN@SFB in PBS at different pH with/without GSH.

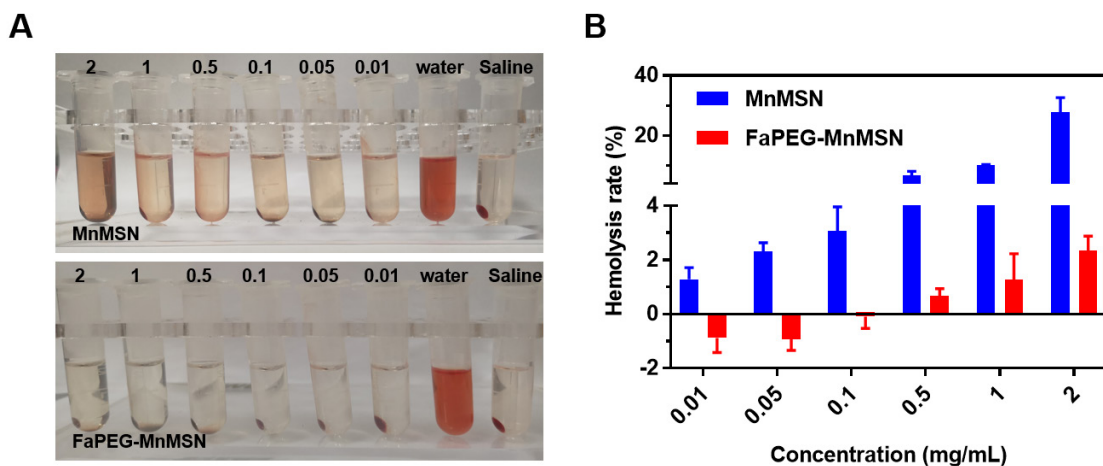


Figure S12. Hemolytic toxicity of MnMSN and FaPEG-MnMSN.