Supporting Information

Integration of Silica Nano-rattles with Manganese-doped In_2S_3/InOOH to Enable Ultrasound-mediated Tumor Theranostics

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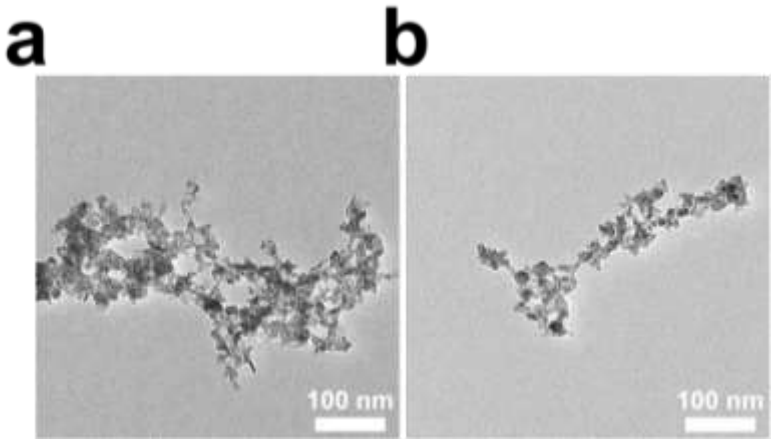

Figure S1. TEM images of (a) 0-MISO and (b) 5-MISO.

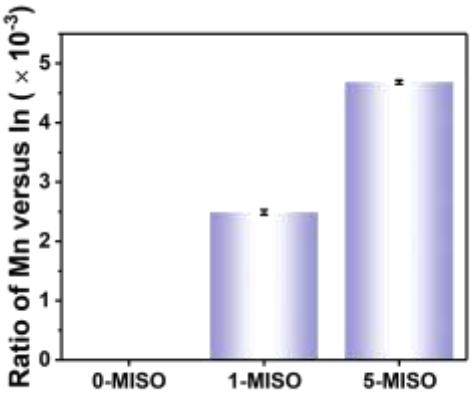

Figure S2. The mass ratio of Mn versus In in 0-MISO, 1-MISO and 5-MISO.

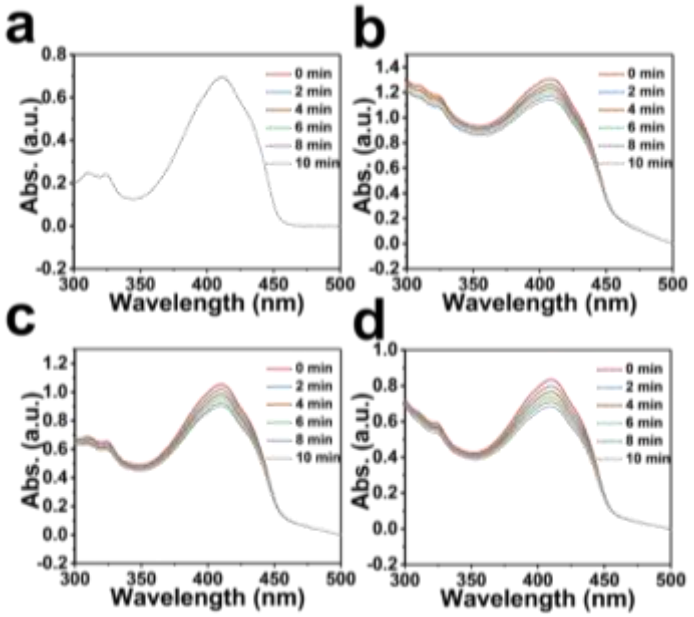

Figure S3. Time-dependent degradation curve of DPBF after incubated with (a) water, (b) 0-MISO, (c) 1-MISO and (d) 5-MISO without ultrasound irradiation.

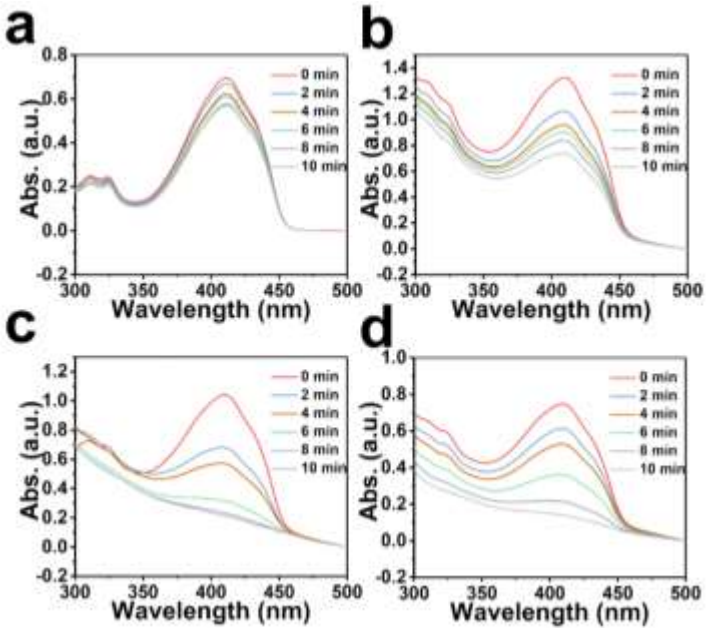

Figure S4. Time-dependent degradation curve of DPBF after incubated with (a) water, (b) 0-MISO, (c) 1-MISO and (d) 5-MISO under ultrasound irradiation (1.0 MHz, 1.0 W/cm^2).

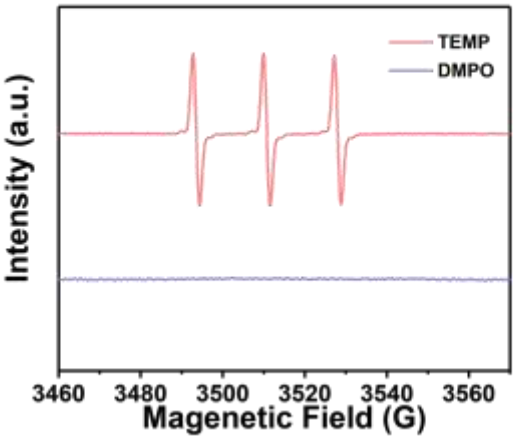

Figure S5. ESR spectra of $^1O_2$ (TEMP as the probe) and ·OH (DMPO as the probe) in the presence of 1-MISO under US irradiation (1 W/cm^2, 2 min).

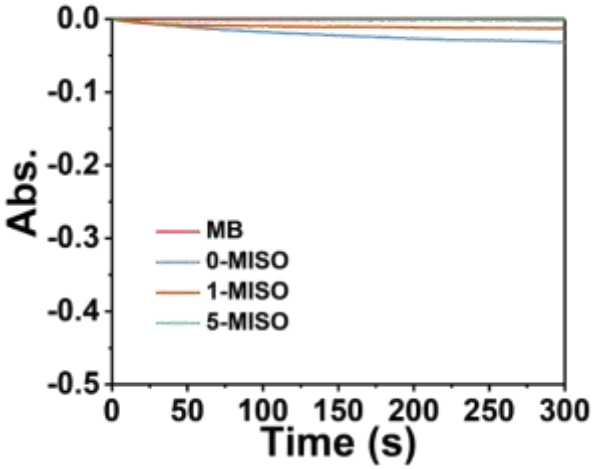

Figure S6. The MB degradation kinetics of MISO (60 μg/ml) with different Mn doping concentrations in the presence of H_2O_2 (10 mM).

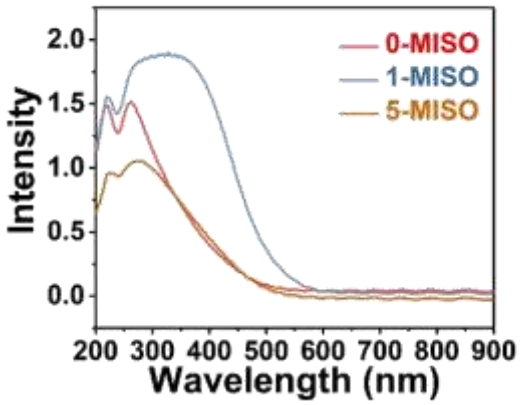

Figure S7. UV-visible diffuse reflectance spectra of 0-MISO, 1-MISO and 5-MISO.

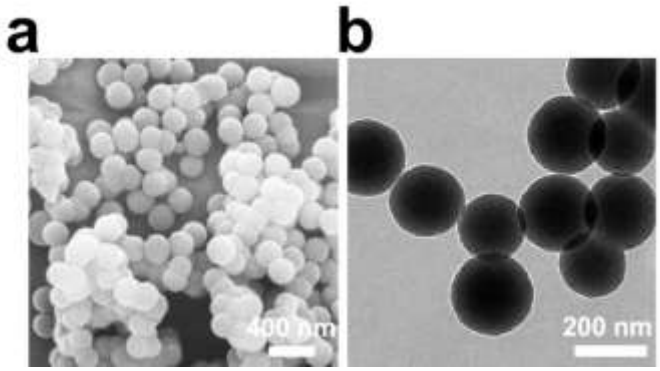

Figure S8. (a) SEM image and (b) TEM image of s/h SiO_2.

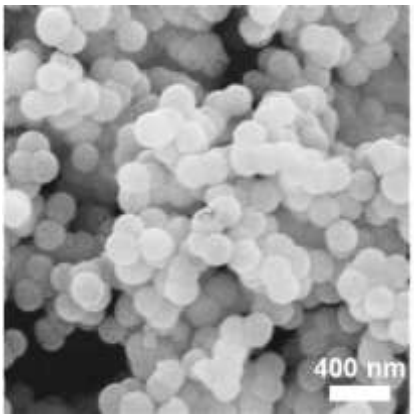

Figure S9. SEM image of rattle-type SiO_2.

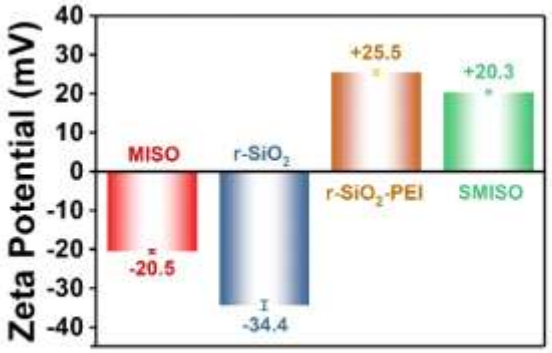

Figure S10. Zeta potentials of MISO, r-SiO_2, r-SiO_2-PEI and SMISO NPs in ultrapure water.

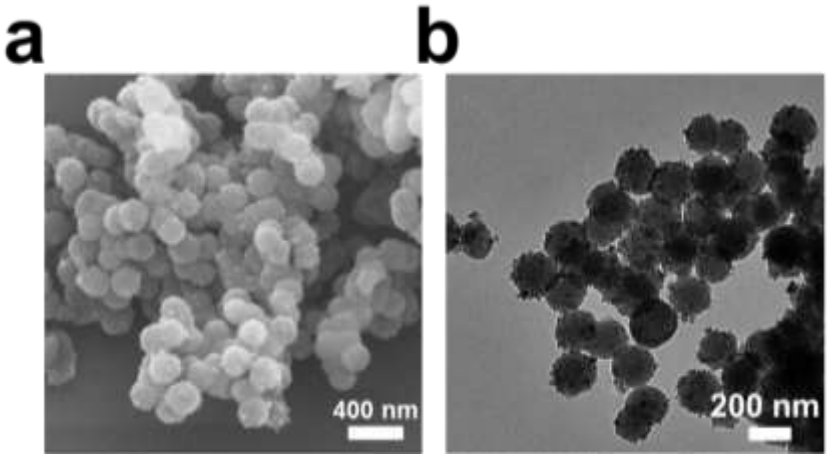

Figure S11. (a) SEM image and (b) low-magnification TEM image of SMISO NPs.

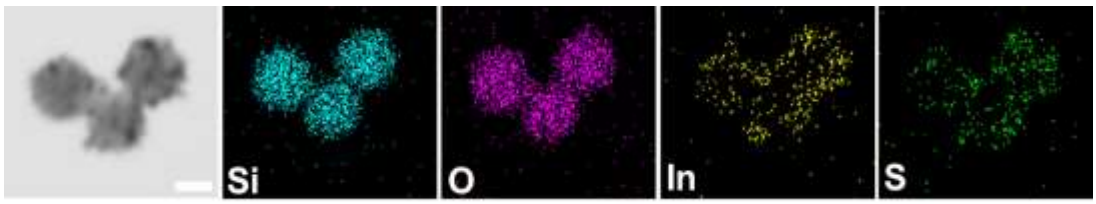

Figure S12. EDS element mapping of SMISO NPs. Scale bar: 100 nm.

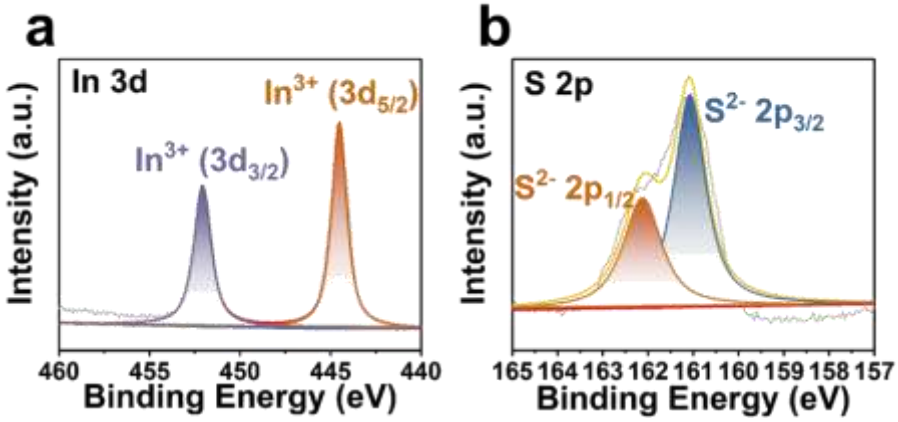

Figure S13. (a) In 3d and (b) S 2p XPS spectra of SMISO NPs.

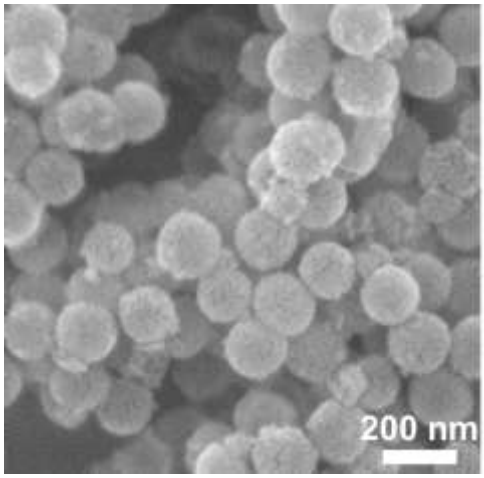

Figure S14. SEM image of SMISO NPs upon acid treatment.

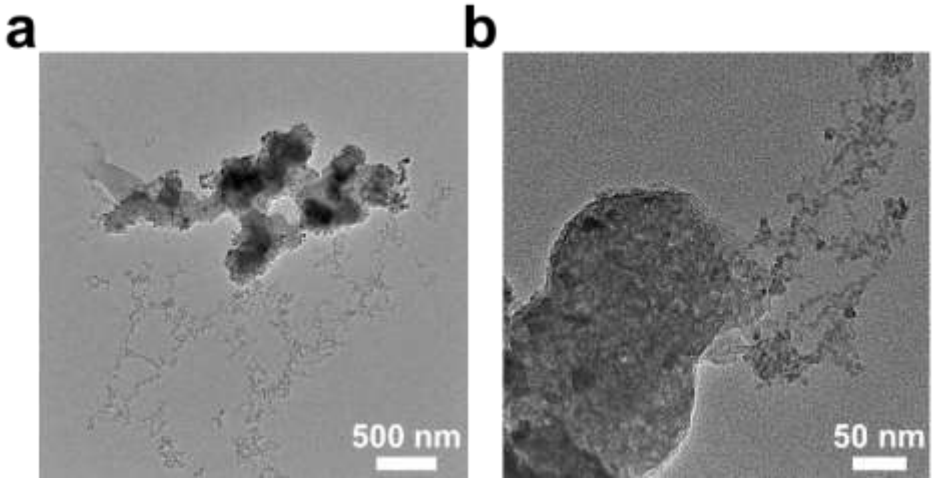

Figure S15. (a) TEM and (b) magnified TEM images of SMISO NPs upon acid treatment.

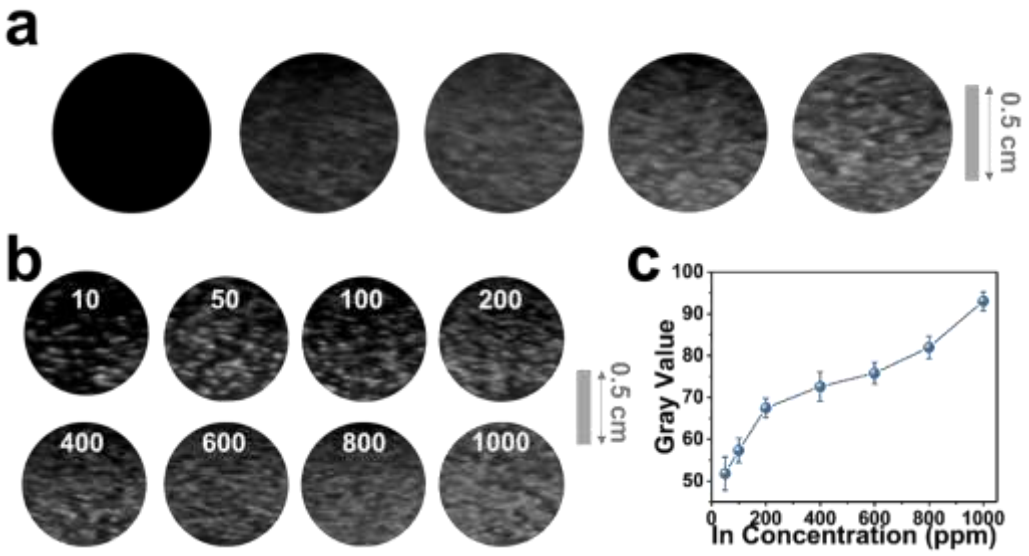

Figure S16. (a) *In vitro* US images of water, s/h SiO_2, r-SiO_2, MISO and SMISO (from left to right). (b) Concentration-dependent US images and (c) the corresponding gray value curve of SMISO NPs (10, 50, 100, 200, 400, 600, 800 and 1000 μg/mL).

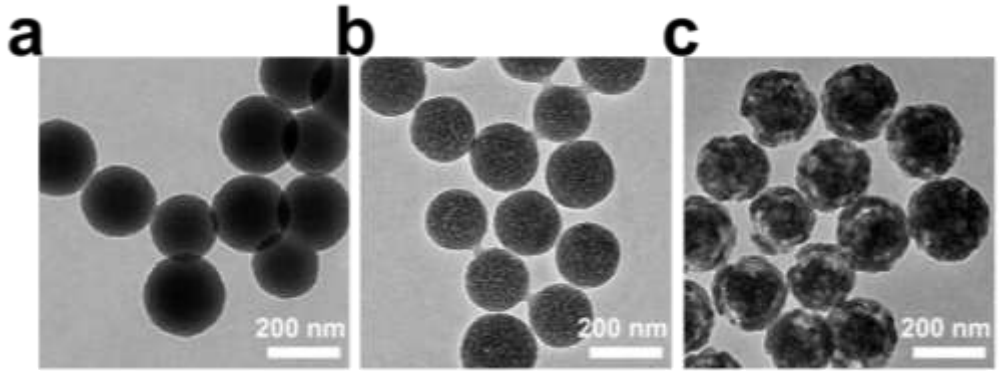

Figure S17. TEM images of SiO_2 NPs etched for different time. (a) 0 h, (b) 0.5 h, (c) 3 h.

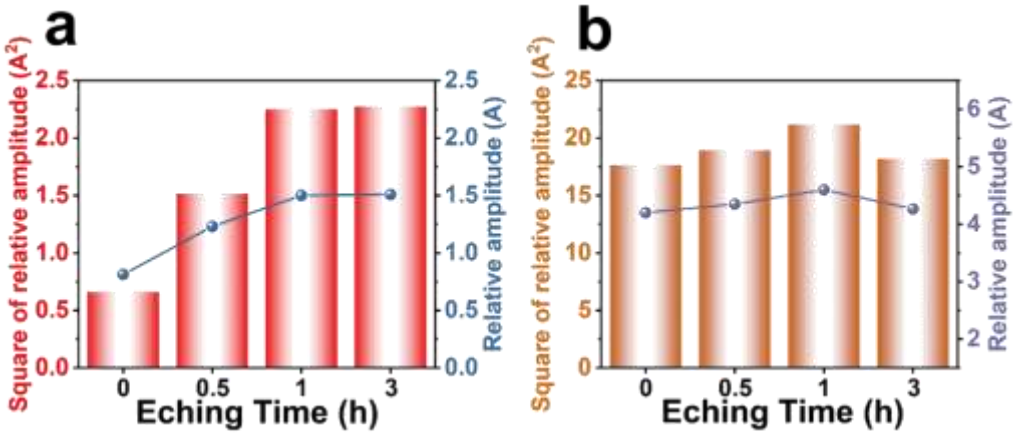

Figure S18. Relative amplitude (A) and its square (A^2) of (a) reflection signals and (b) scattering signals of SiO_2 etched for different time.

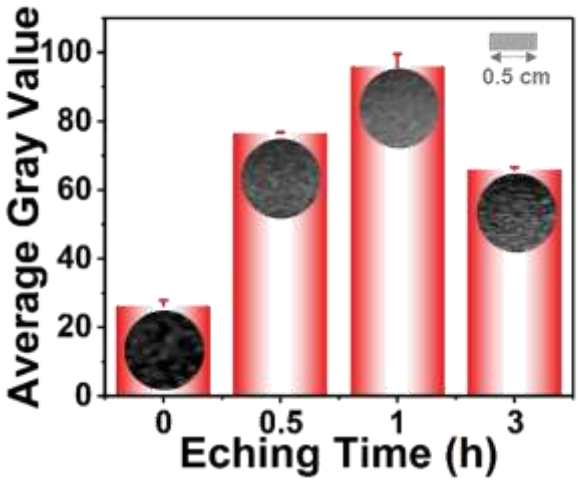

Figure S19. Comparison of measured average gray value in US imaging *in vitro* of SiO_2 etched for different time. (Inner: Relative US images *in vitro*.)

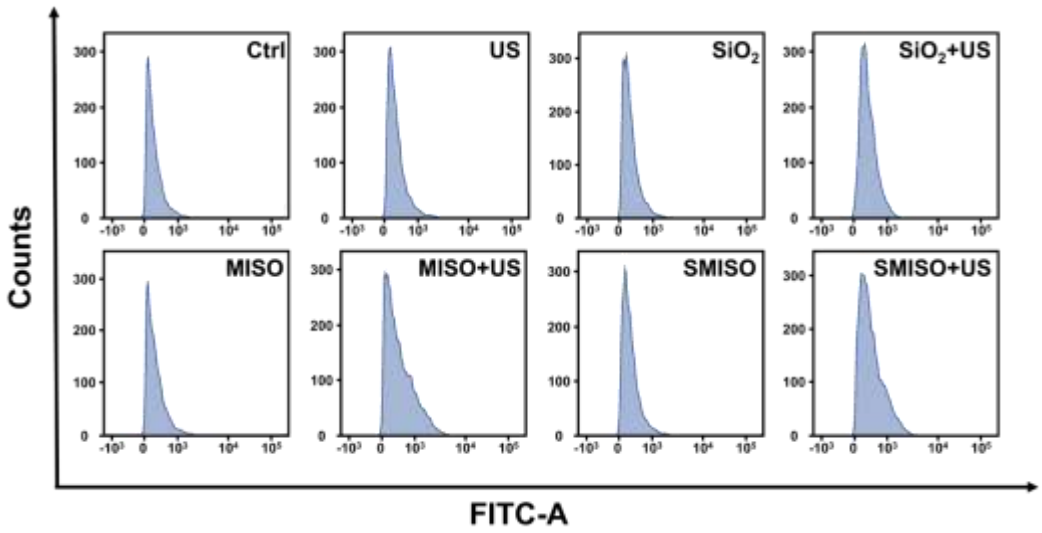

Figure S20. ROS fluorescence intensity of 4T1 cells by flow cytometry analysis after different treatments.

Table S1. The ROS quantification intensity (n = 3) of 4T1 cells by flow cytometry analysis after different treatments.

Group	Ctrl	US	SiO_2	SiO_2+US	MISO	MISO+US	SMISO	SMISO+US
Intensity	225	291	248	381	289	522	308	593
	258	259	250	391	311	556	278	538
	263	335	295	421	312	544	298	574

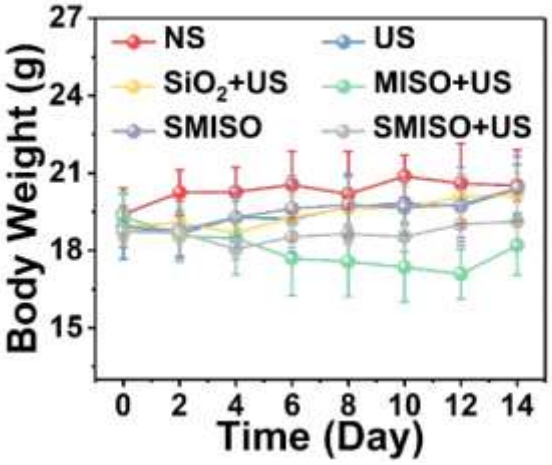

Figure S21. The body weight variation of mice after different treatments (n = 5, mean ± SD).

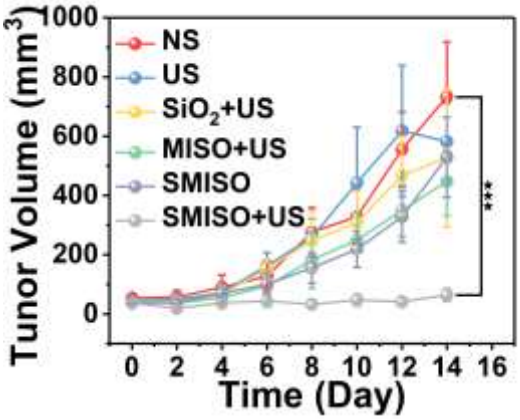

Figure S22. The original tumor volume variation of mice after different treatments (n = 5, mean ± SD). *** $p < 0.001$, ** $p < 0.01$ and * $p < 0.05$.

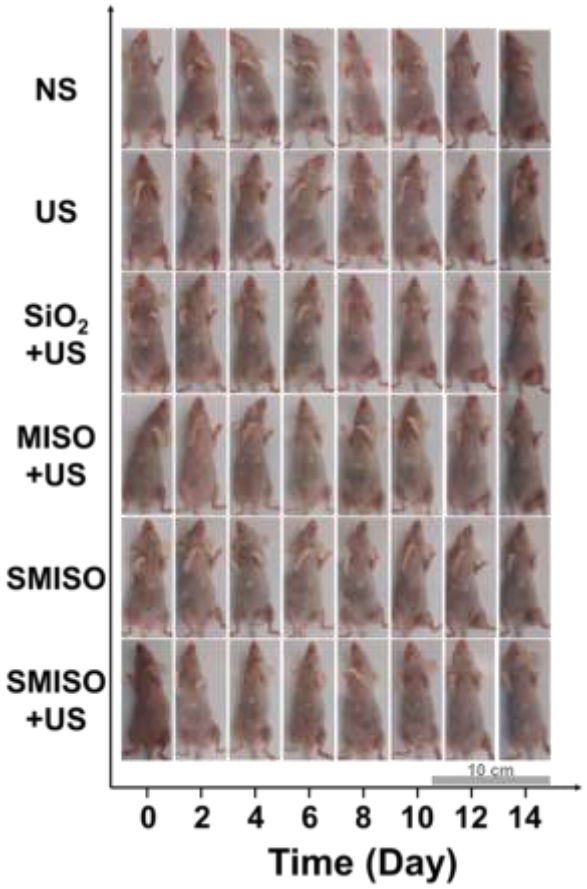

Figure S23. The representative mice photographs of each group recorded every 2 days.

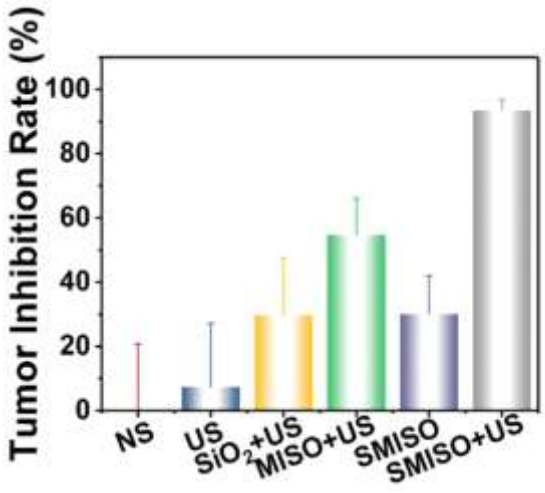

Figure S24. Comparison of tumor inhibition rate in various groups (n = 5, mean ± SD).

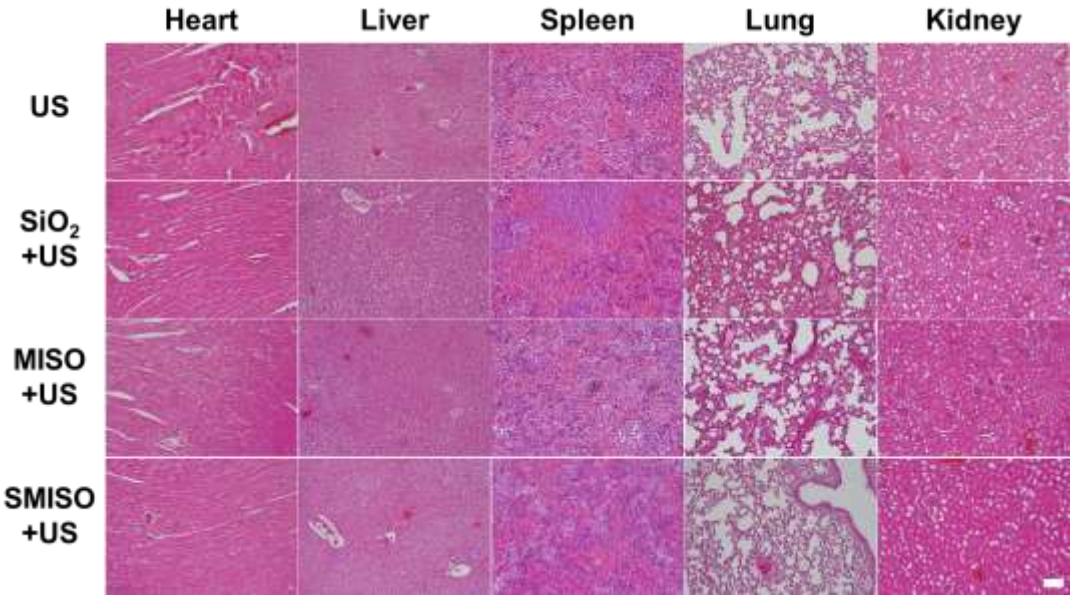

Figure S25. H&E staining images of main organs after different treatments. Scale bar: 100 μm.