

Supporting information

Intelligent and biocompatible photosensitizer conjugated silicon quantum dots-MnO₂ nanosystem for fluorescence imaging-guided efficient Photodynamic Therapy

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Supplementary figures

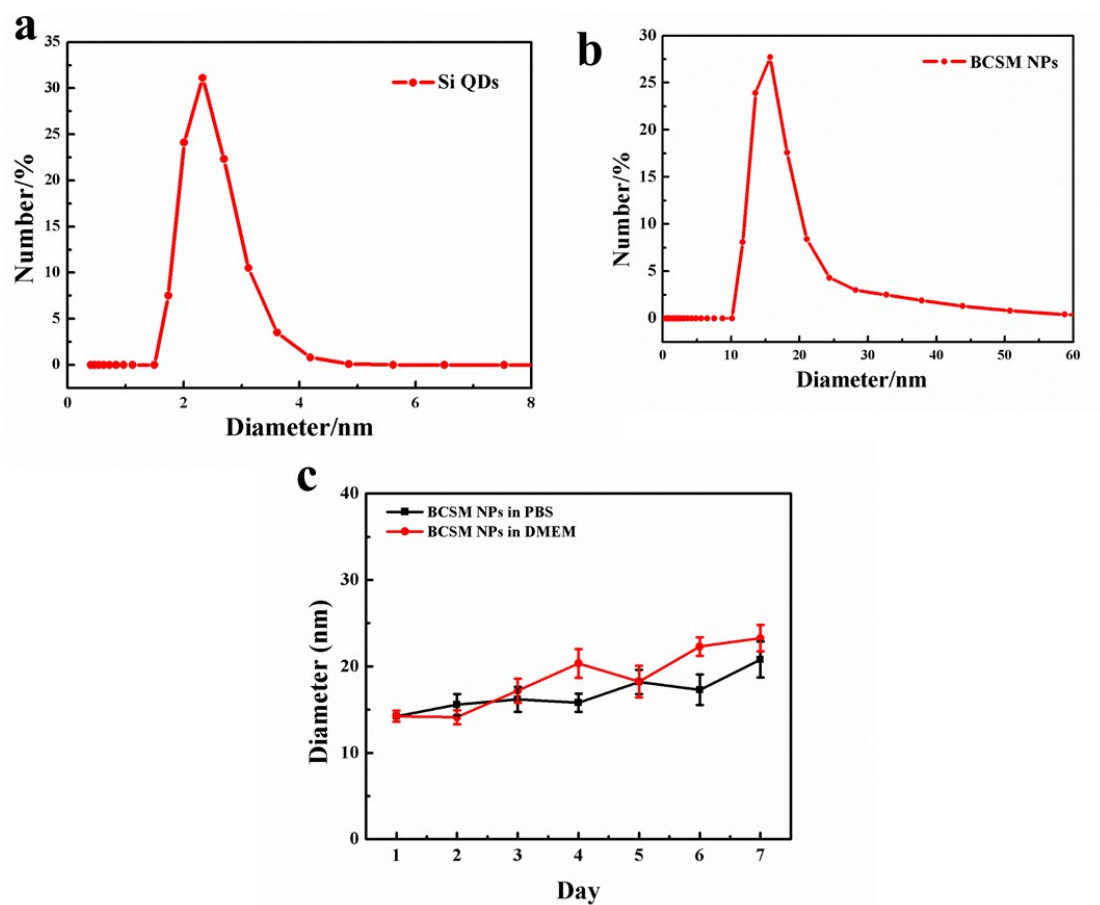


Fig. S1 Hydrodynamic diameters of Si QDs (a) and BCSM NPs detected by DLS. The hydrodynamic size changes of BCSM NPs in PBS and DMEM solutions in different solutions (PBS and DMEM) in a week (c).

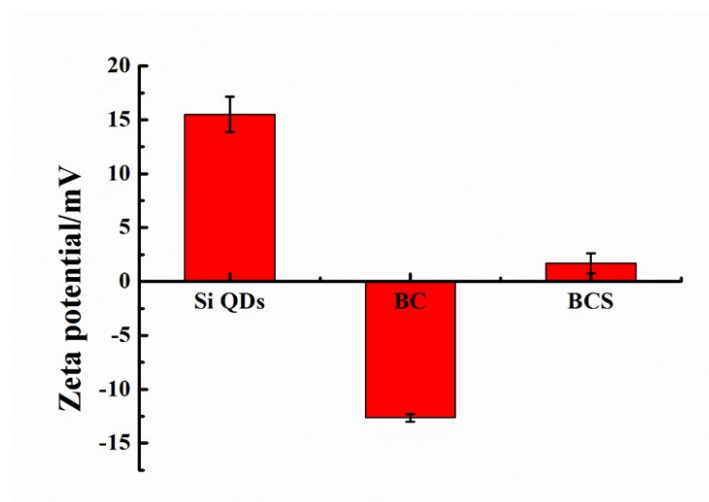


Fig. S2 Zeta potentials of Si QDs, BC and BCS NPs.

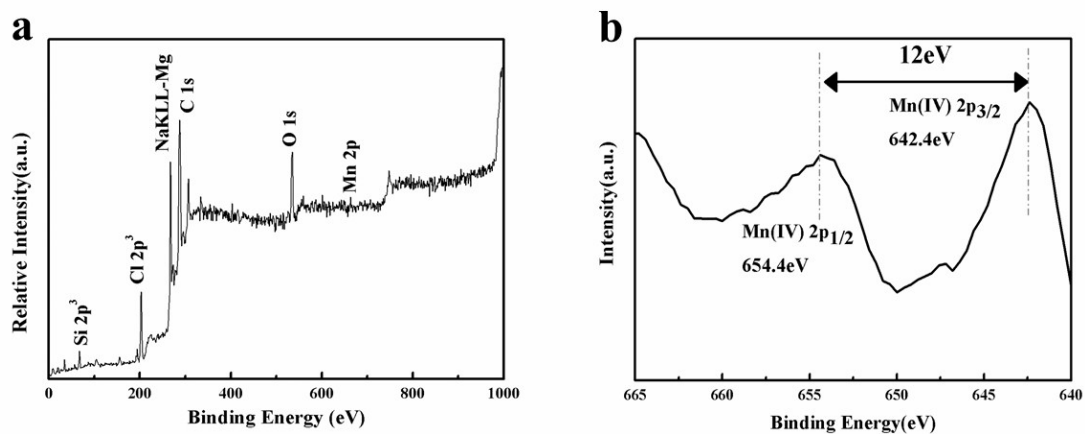


Fig.S3 High resolution X-ray photoelectron spectroscopy (XPS) spectrum of (a) full range, (b) Mn 2p of the BCSM NPs.

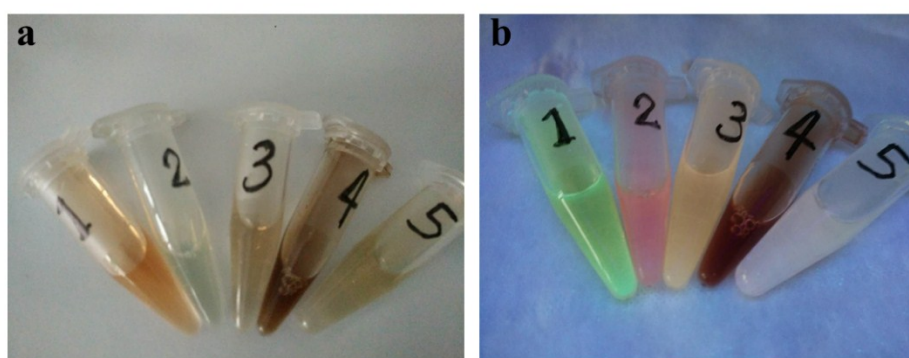


Fig. S4 Photos of Si QDs (1), BC (2), BCS (3), BCSM NPs (pH=7.4) (4) and BCSM NPs (pH=6.5) (5) solutions under visible light and UV light illumination (365 nm), respectively.

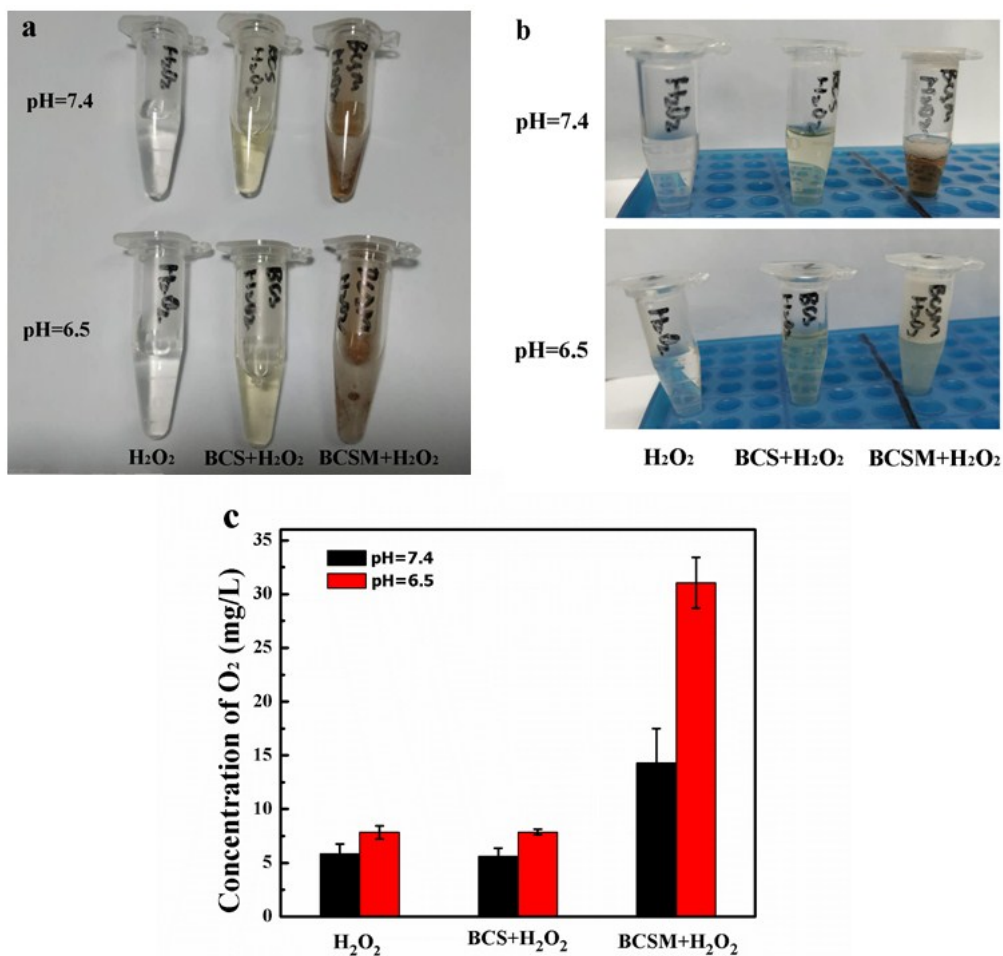


Fig. S5 Photos of BCSM NPs mixed with or without 50 μ L H₂O₂ in the neutral or acid aqueous solutions at 0 h (a) and at 1 h (b). Oxygen generation in H₂O₂ aqueous with BCSM NPs under different pH at 5 min (c).

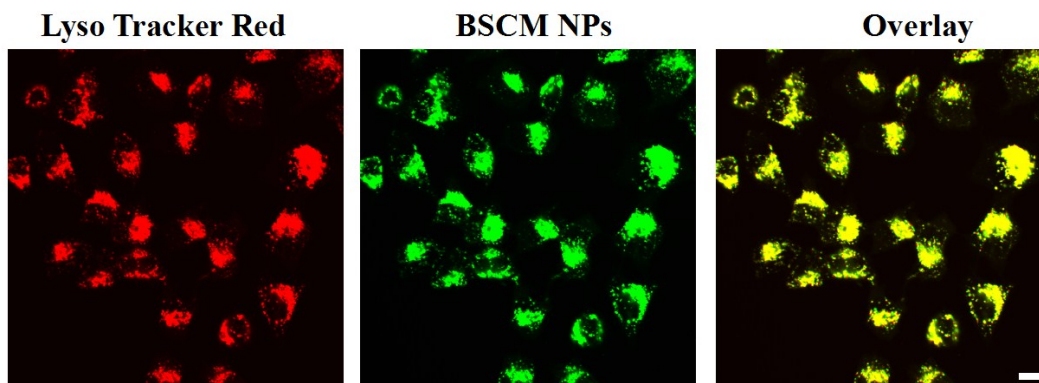


Fig. S6 LSCFM images of Hela cells incubated with BCSM NPs for 4 h then incubated with LysoTracker Red for 30 min. Red and green represent lysosome and BCSM NPs fluorescence at the excitement wavelength of 575 nm and 405 nm, respectively. Concentrations of Ce6, Si QDs, MnO₂ were 4.5 μ M, 100 μ g/mL and 2.8 mM. Scale bars: 20 μ m.

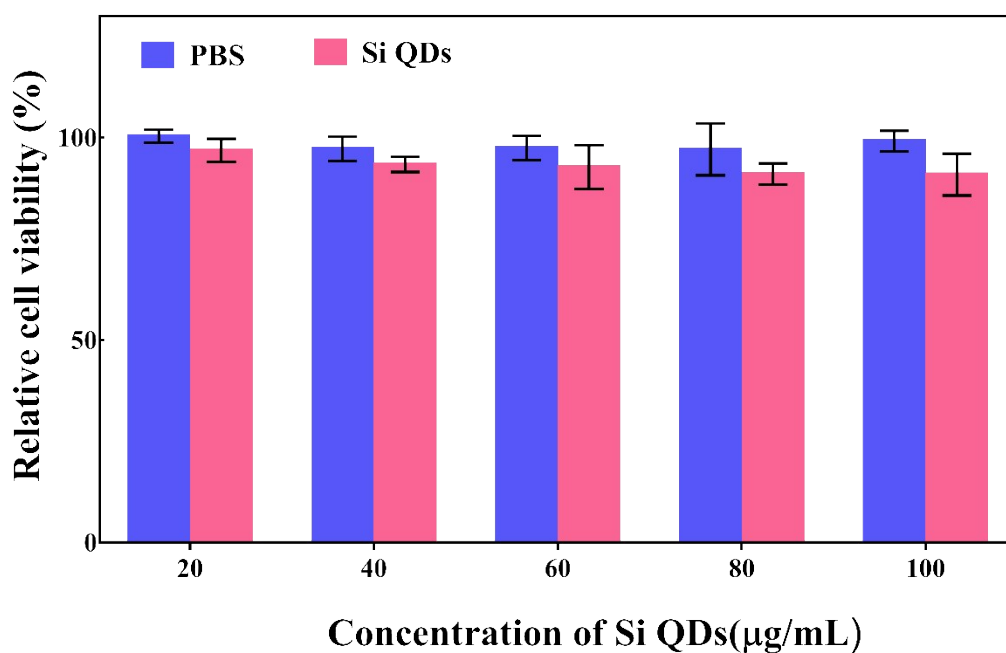


Fig. S7 Relative viabilities of Hela cells treated by different Si QDs under 638nm light exposure for 30 min (5 mW/cm²).

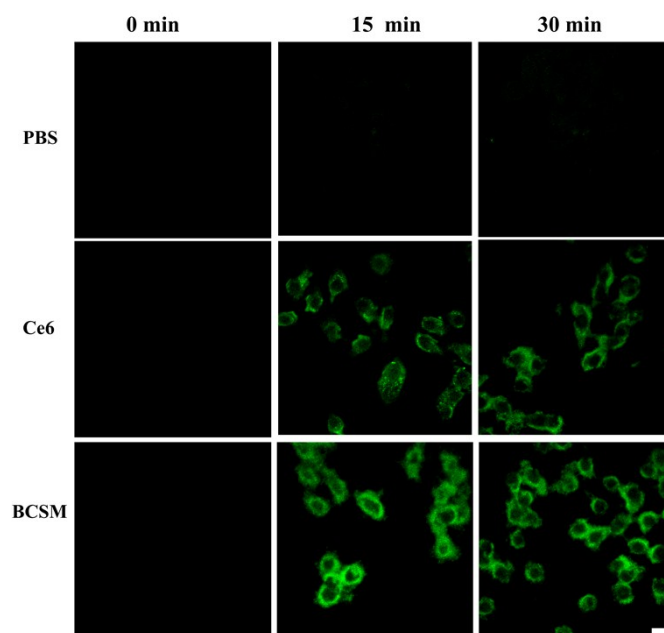


Fig. S8 LSCFM images of Hela cells for the Singlet oxygen (SO) detection using SO specific fluorescent probe DCFH-DA after 638 nm laser irradiation (5 mW/cm^2) for 0, 15, 30 min. The excitation wavelength is 488 nm. Scale bar: $30 \text{ }\mu\text{m}$.

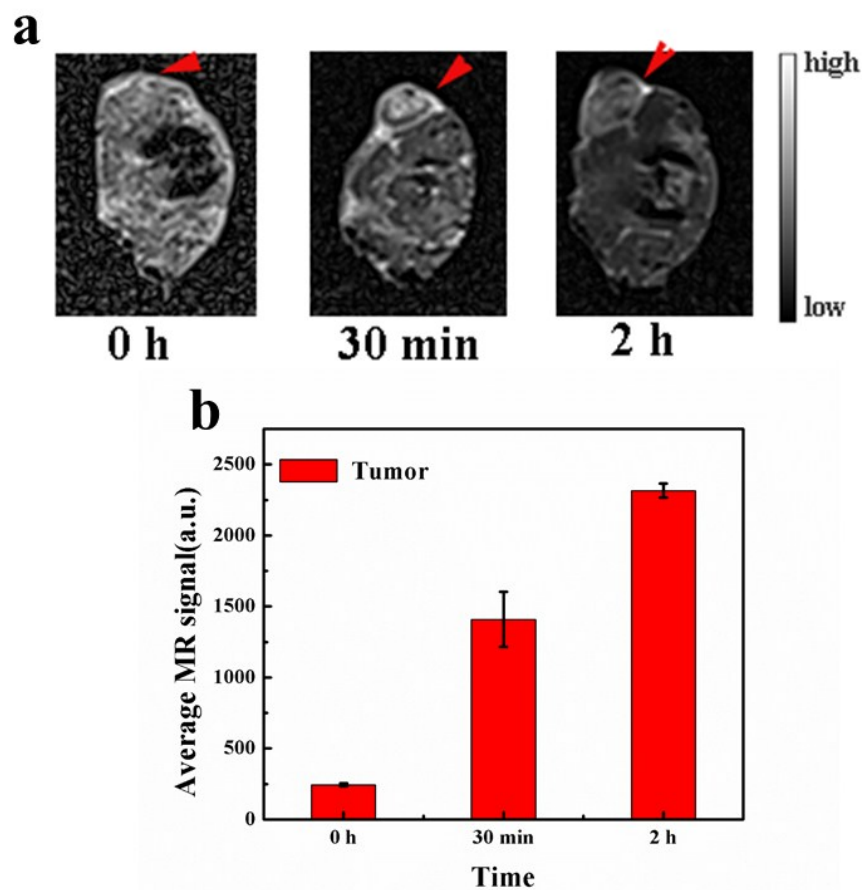


Fig. S9 a) T1-weighted MR images of Hela tumor-bearing mice before and after injection with 125 μ L BCSM NPs (concentrations of Ce6, Si QDs, MnO_2 were 4.5 mM, 100 mg/mL and 2.8 mM respectively) for 30 min and 1 h. The semi-quantification MR intensities of tumor based on MRI images (Fig. S9 a).

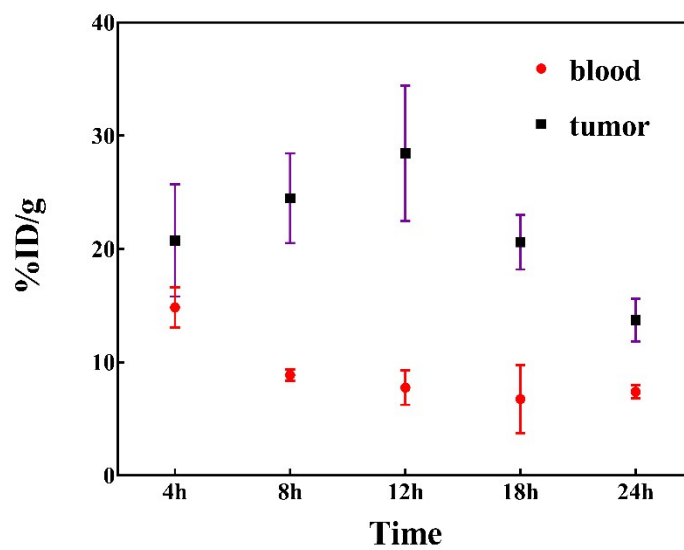


Fig. S10 Blood circulation curve of BCSM NPs in mice by measuring the concentration of Si in blood and tumor at different time points post injection. (%ID/g = percentage of the injected dose per gram of weight.)