Support Information

Gd^{3+}-doped $MoSe_2$ nanosheets as a theranostic agent for bimodal imaging and high efficiency cancer photothermal therapy

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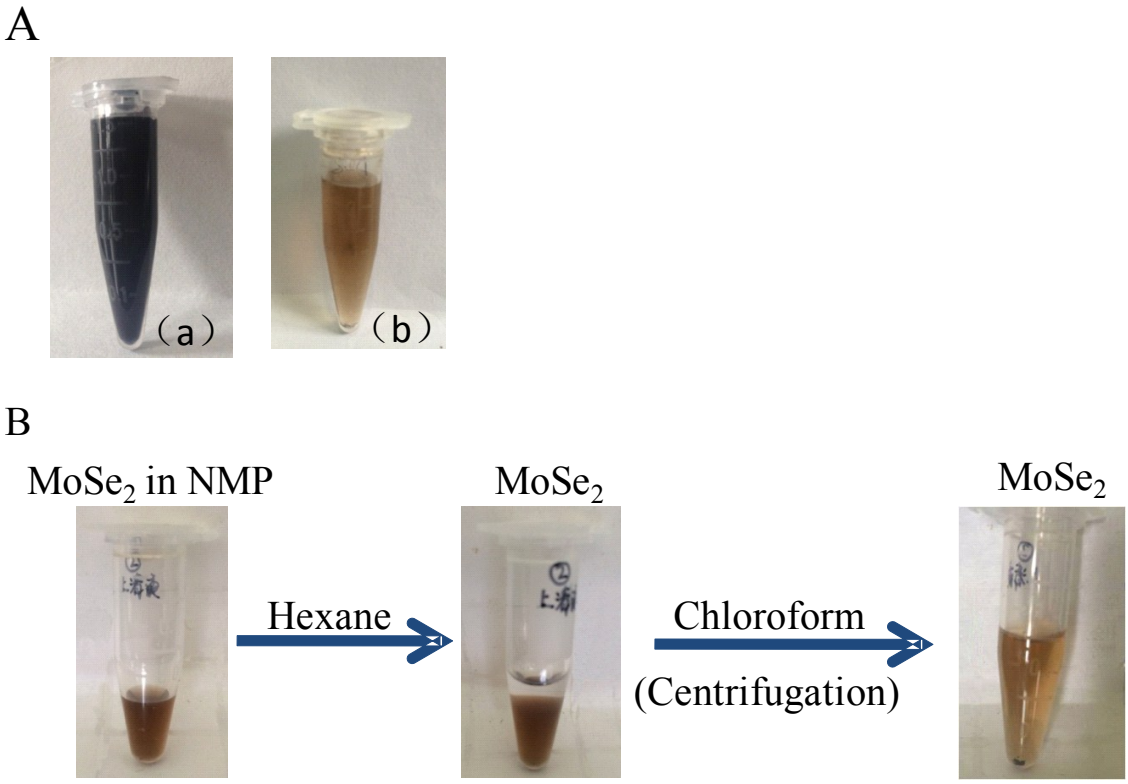

Figure S1. (A)Photographs of the suspensions of (a) raw $MoSe_2$ and (b) $MoSe_2$ treated with grinding and sonication.

(B)The separation process by addition of hexane and then chloroform, maybe followed by centrifugation..

(a) $MoSe_2$ dispersed in NMP after addition of hexane (NMP:hexane=1:1, v:v).

(b) The dispension in after addition of chloroform (NMP:chloroform=1:1, v:v), maybe accompanied by a small amount of precipitation.

(c) Samples after centrigfuging at 5,000 rmp for 10 min.

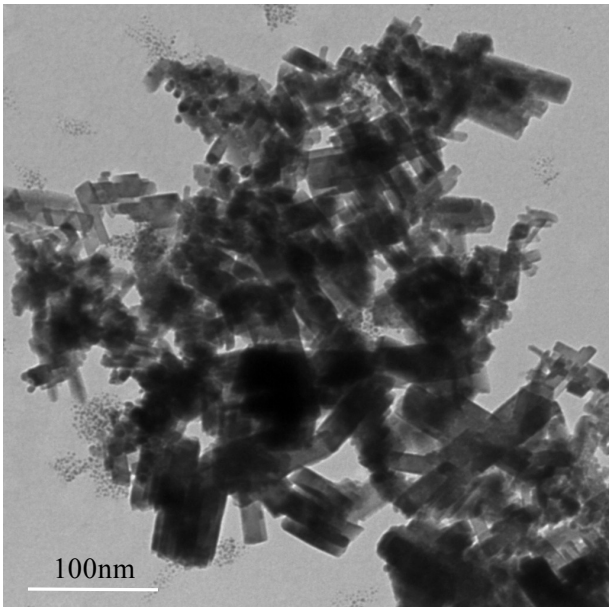

Figure S2. TEM image of PEGylated $MoSe_2(Gd^{3+}$-3) nanosheets.

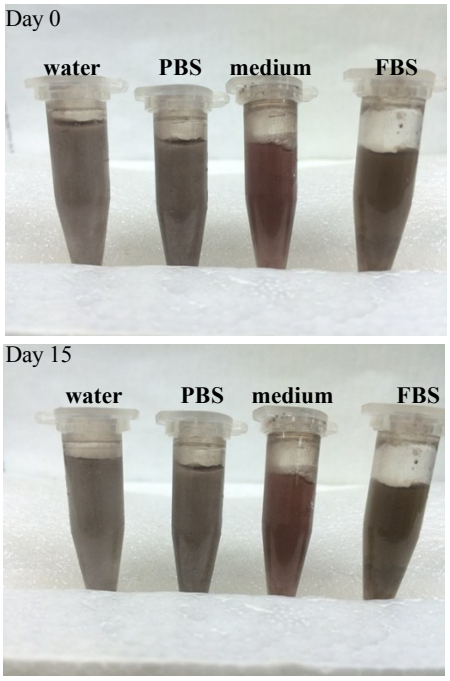

Figure S3. Photos of $MoSe_2(Gd^{3+})$-PEG nanosheets in water and physiological solutions, including phosphate buffered saline (PBS), cell culture medium, and fetal bovine serum(FBS) , after 0 (upper) or 15 days (bottom).

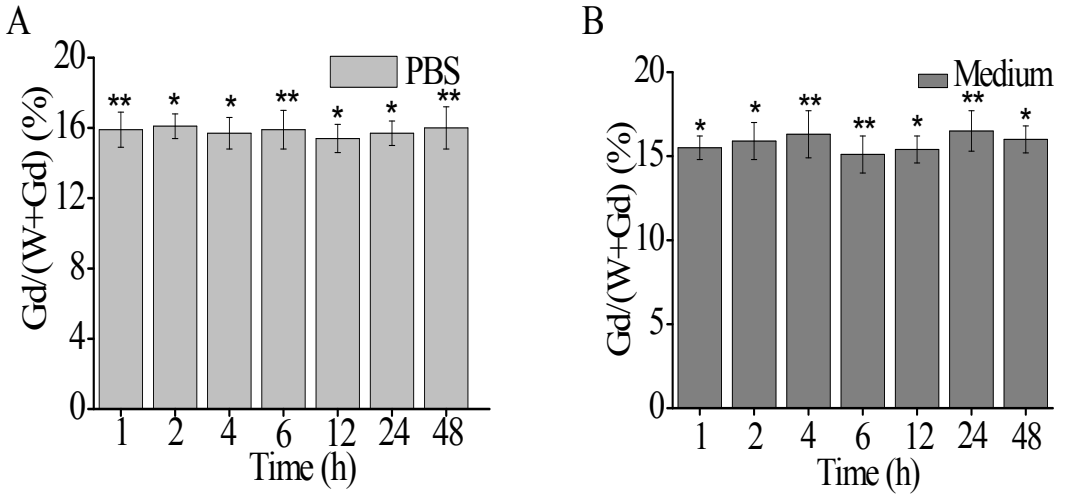

Figure S4. Stability of doped Gd^{3+} in of $MoSe_2(Gd^{3+}$-3)-PEG nanosheets in PBS(A) or in cell culture medium(B) for different stored time. Those samples were determined by the ICP-AES to measure Gd^{3+} percentages. No abrupt change of Gd^{3+}-content in those samples was observed, suggesting no obvious leakage of doped Gd^{3+} from of $MoSe_2(Gd^{3+}$-3)-PEG nanosheets. p values: *p < 0.05, **p < 0.01.

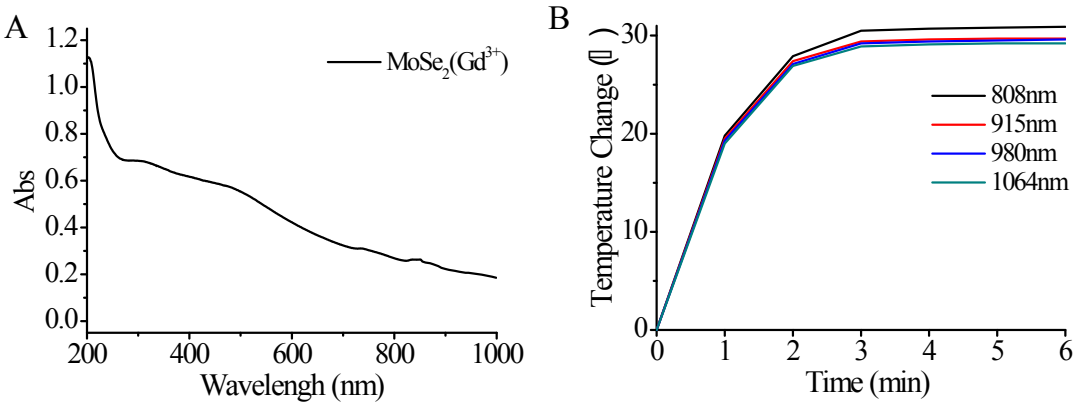

Figure S5. (A) UV-vis-NIR absorption spectrum of $MoSe_2(Gd^{3+})$-PEG. (B) Photothermal heating curves of $MoSe_2(Gd^{3+})$-PEG at the same concentrations under different NIR laser irradiation.

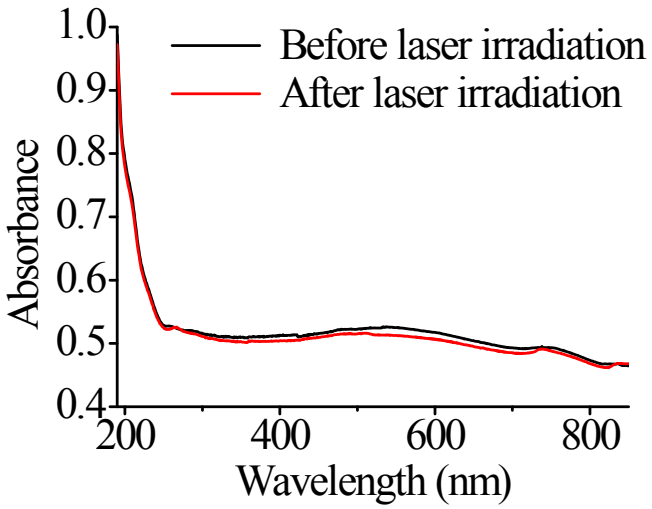

Figure S6. UV-vis-NIR spectra of the $MoSe_2(Gd^{3+})$-PEG nanosheets under 808 nm laser before and after irradiation at 2 W/cm^2 for 60 min.

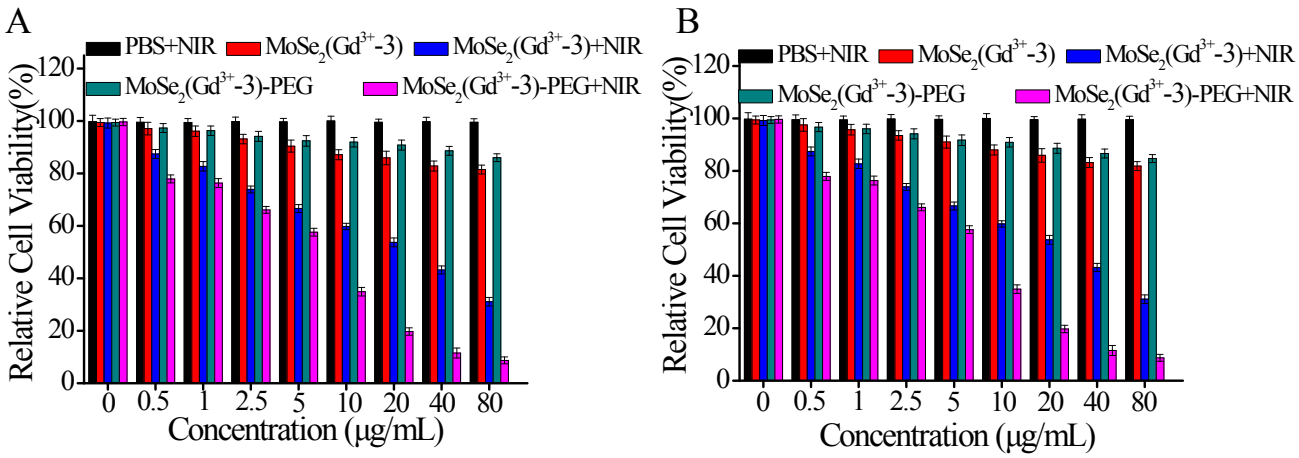

Figure S7. (A&B) Cell relative viabilities of 4T1 cells and SGC-7901 cells after being incubated with different concentrations of $MoSe_2(Gd^{3+}$-3) or $MoSe_2(Gd^{3+}$-3)-PEGfor 24 h and then being exposed to the 808 nm NIR laser for 5 min.

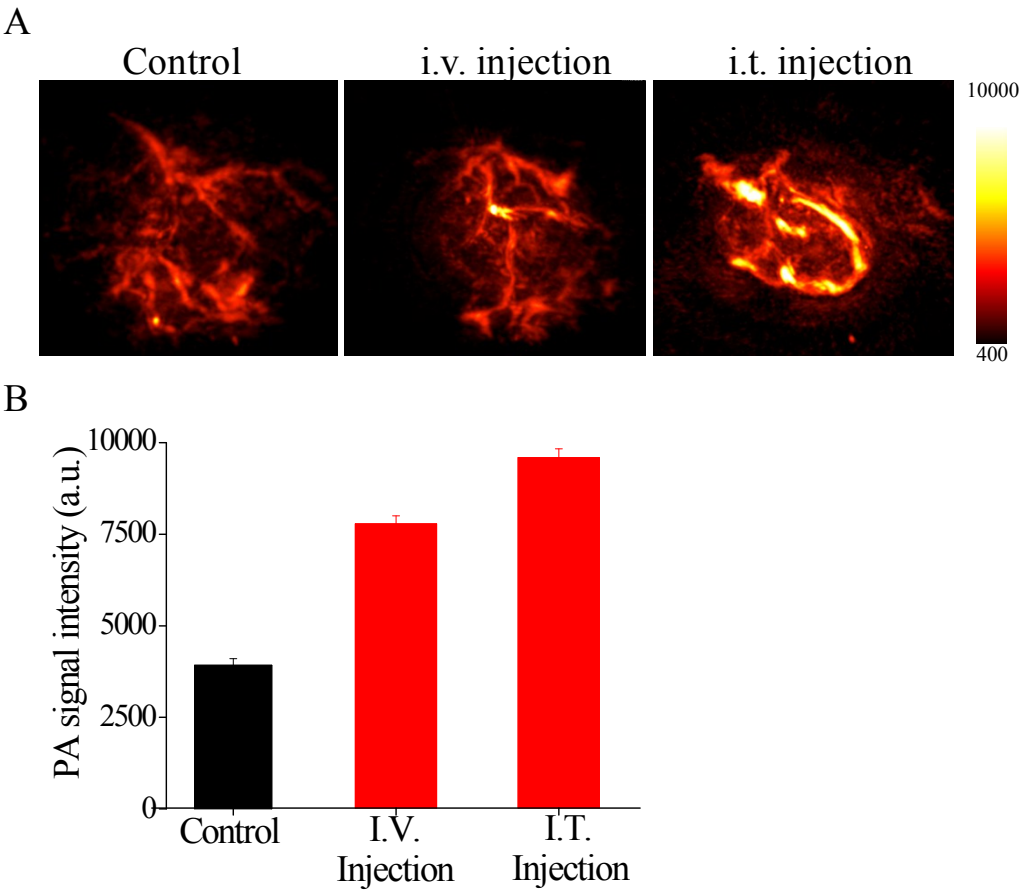

Figure S8. (A) PA images of tumors on mice before and after i. t. or i. v. injection with $MoSe_2(Gd^{3+}\text{-}3)$-PEG. (B) Photoacoustic signals inside the tumors before and after i. t. injections or i. v. injections of $MoSe_2(Gd^{3+}\text{-}3)$-PEG. The injection dosages of i,t. injection and i.v. injection were 10 or 100 μL at the concentration of 0.2 mg/mL, respectively.

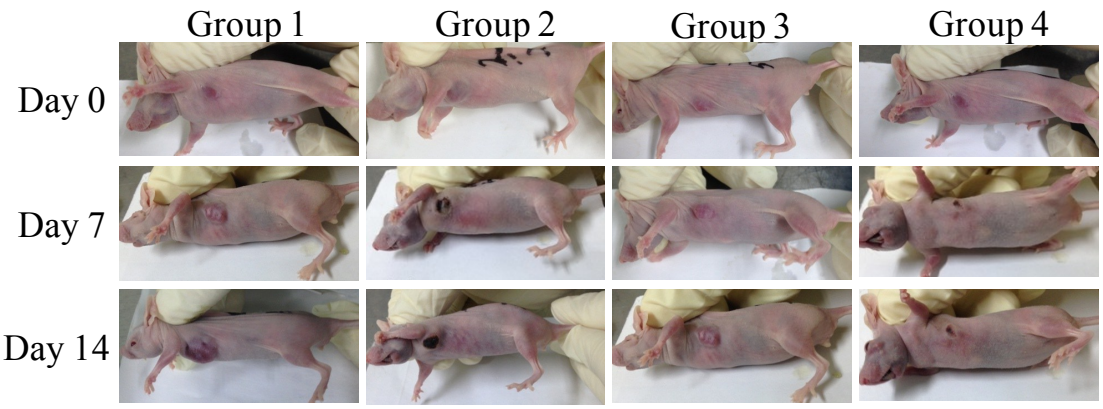

Figure S9. Corresponding photographs of mice before treatment and after14 days various treatments.Group (i): saline as the control; Group (ii): Only NIR laser irradiation; Group (iii): i.v. injection with $MoSe_2(Gd^{3+}\text{-}3)$-PEG; Group (iv):i.v. injection with $MoSe_2(Gd^{3+}\text{-}3)$-PEG+NIR.