## **Supporting Information**

Synthesis of Two-Dimensional Bi<sub>2</sub>Te<sub>3</sub>@SiO<sub>2</sub> Core-Shell Nanosheets for Fluorescence/Photoacoustic/Infrared (FL/PA/IR) Tri-Modal Imaging-Guided Photothermal/Photodynamic Combination Therapy Zhihao Zhou<sup>a</sup>, Wei Zhang<sup>b</sup>, Lei Zhang<sup>c</sup>, Yang Cao<sup>b</sup>, Zhigang Xu<sup>a</sup>, Yuejun Kang<sup>a</sup>, Peng Xue<sup>\*a</sup>

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**Fig. S1** (a) Aqueous dispersion of (1)  $Bi_2Te_3$ , (2)  $Bi_2Te_3@SiO_2/APTES$  and (3) BSC NSs in DI water; (b) Dispersion of BSC NSs in the mediums of DI water, PBS and DMEM (with 10% FBS).



**Fig. S2** Long-term stability of BSC NSs under different conditions, evaluated by monitoring the hydrodynamic size in DI water, PBS and DMEM (containing 10% FBS) for seven days.



Fig. S3 Core level XPS spectra of (a) Bi, (b) Te, (c) O, (d) Si, (e) N and (f) C in BSC

NSs, corresponding to Fig. 2f.



**Fig. S4** (a) UV-vis-NIR absorption curve of free Ce6 at different concentrations; (b) fitted curve of absorbance (660 nm) *vs.* Ce6 concentration in correspondence to (a).



Fig. S5 Optical absorption spectra of (a) DI water and (b) Ce6 (10  $\mu$ g·mL<sup>-1</sup>) containing

DPBF upon 660 nm laser irradiation for different periods.



Fig. S6 Mean fluorescence intensity (MFI) of (a) Ce6 channel, (b) Ce6 channel and (c)

DCF channel corresponding to Fig. 5a, Fig 5b and Fig 5d, respectively.



Fig. S7 Intracellular ROS generation of 4T1 cells after being treated by BSC NSs (equivalent Ce6 concentration:  $10 \ \mu g \cdot mL^{-1}$ ) for various periods (0.5, 2 and 4 h), followed by 660 nm irradiation for 5 min (scale bar: 50  $\mu$ m).



Fig. S8 Viability of HUVEC and L929 cells after being incubated with BSC NSs (concentration ranging from 0 to  $150 \mu g/mL$ ) for 24 h.



Fig. S9 Temperature elevation of tumor region upon NIR laser irradiation for 10 min corresponding to Fig. 7c.



**Fig. S10** Hemolysis rate by incubating erythrocytes with DI water, PBS or BSC NSs at gradient concentrations (inset: photographs of centrifuge tubes containing corresponding samples).



Fig. S11 Key indicators of blood routine test at different time points after KM mice being administered with BSC NSs (equivalent Ce6 concentration of 1 mg·kg<sup>-1</sup>). The yellow hatched area represents the reference ranges of hematology index of healthy mice.