Supporting Information

Integration of TaO_x with Bi_2S_3 for Targeted Multimodality Breast Cancer Theranostics

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The photothermal conversion efficiency (η) is calculated with the following equation

$$\eta = \frac{\mathrm{hs}(T_{\max} - T_{surr}) - Q_{dis}}{I(1-10^{-A_\lambda})}$$

where *h* is heat transfer coefficient, *s* is the surface area of container, (T_{max}− T_{surr}) is the temperature difference between the system and the ambient, Q_{dis} is the heat dissipation of the container, which is calculated independently with pure water measured at the same conditions, *I* is the laser power density, and A_λ is the absorbance of the sample at wavelength of λ. *hs* can be calculated using the equation

$$hs = m_w C_w / \tau_s$$

where m_w is the mass of water (1.0 g), C_w is the heat capacity of water (4.2 J/g), and τ_s is a time constant of the studied system. τ_s can be obtained from a plot of the cooling time versus $-\ln(\theta)$ obtained from the cooling stage, where $\theta = (T_t - T_{surr})/(T_{max} - T_{surr})$. The value of Q_{dis} was measured to be 26.6 mW in this study.

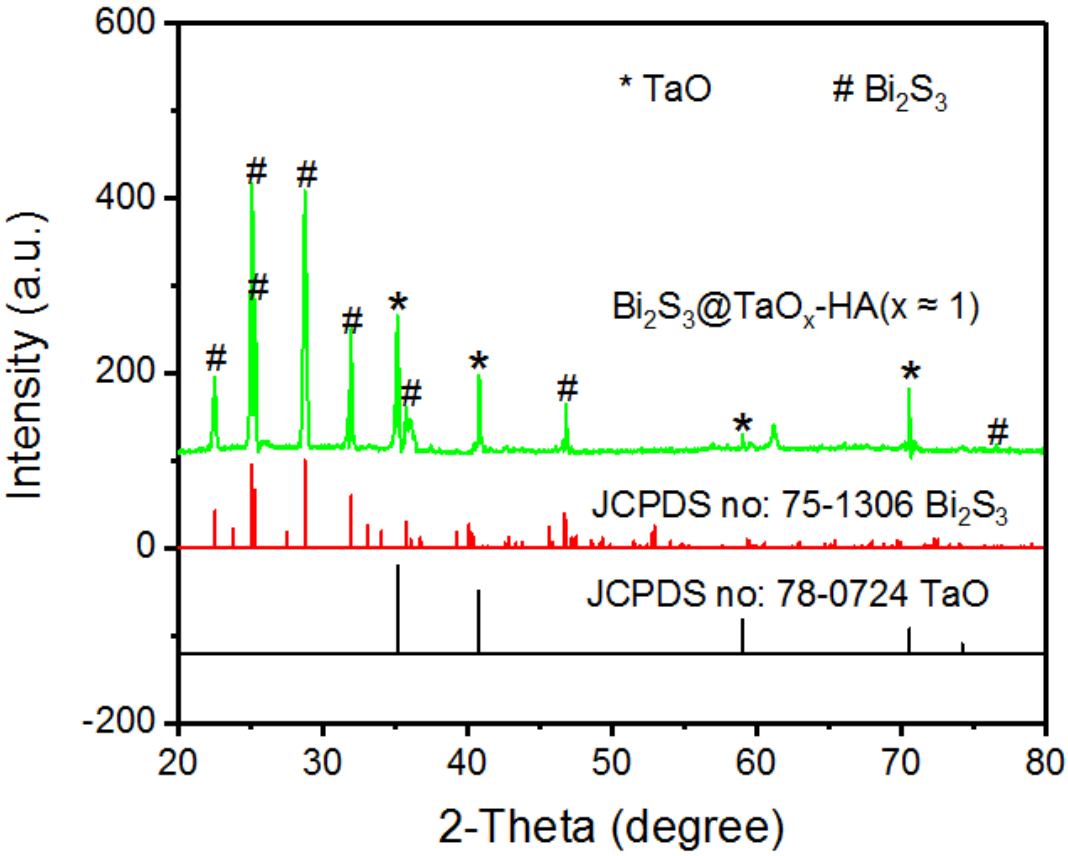

Figure S1. XRD pattern of Bi_2S_3@TaO_x-HA

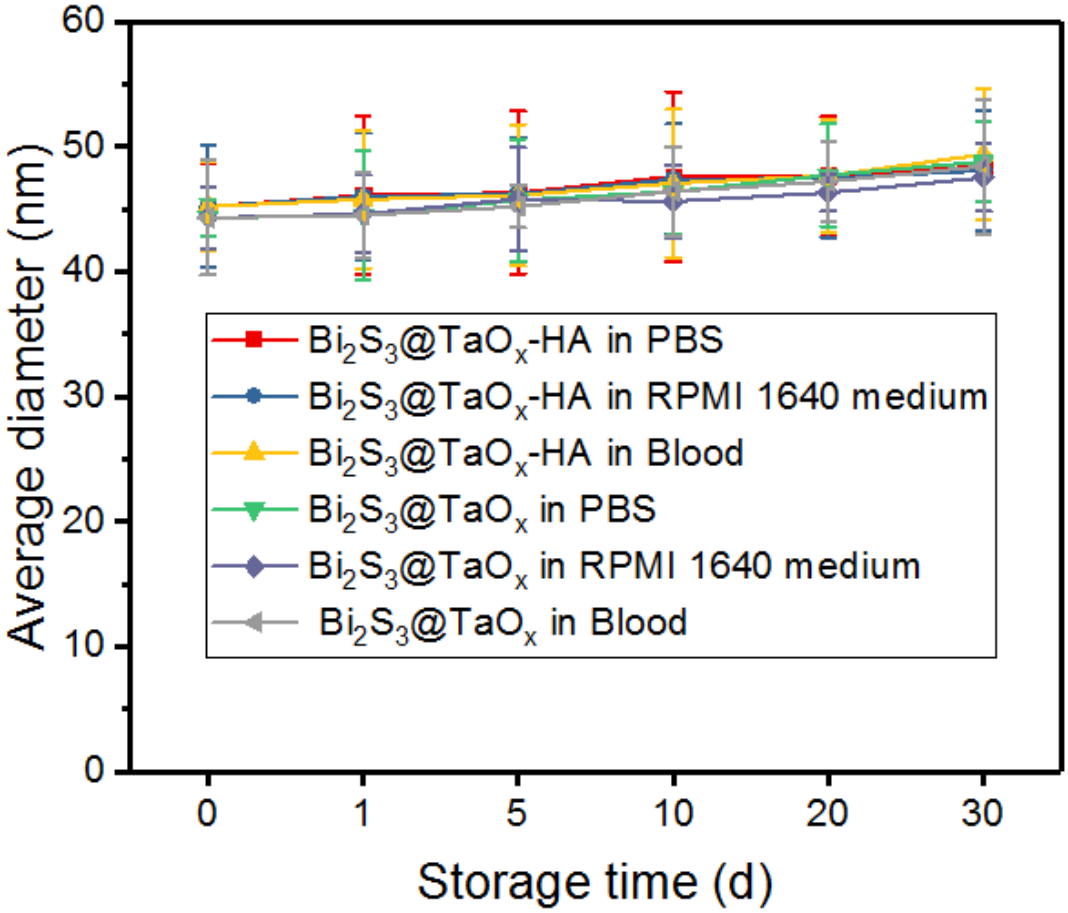

Figure S2. Average diameter of the Bi_2S_3@TaO_x-HA and Bi_2S_3@TaO_x nanoparticles that were dissolved in PBS, RPMI 1640 medium and blood.

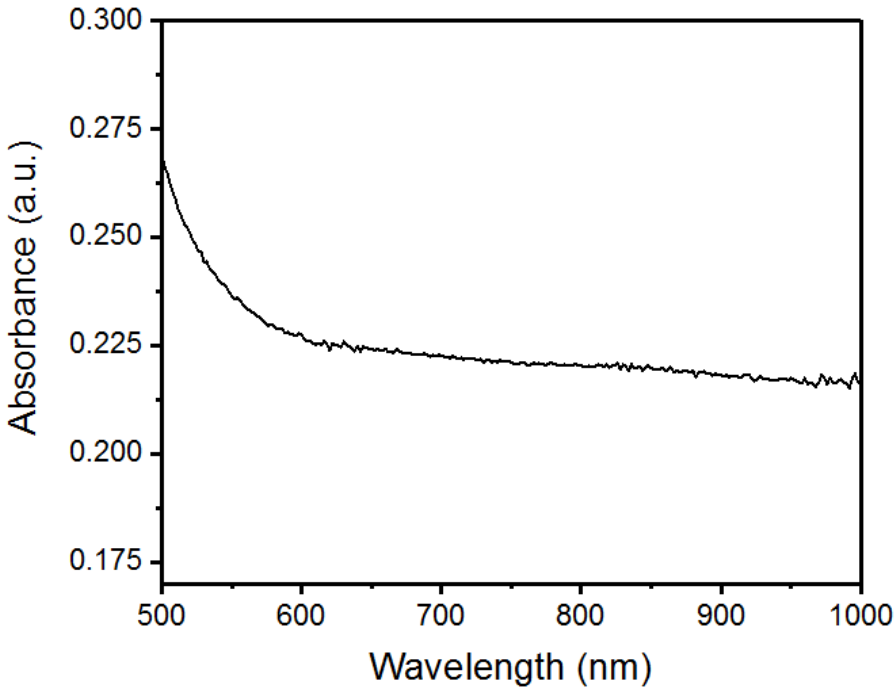

Figure S3. UV-Vis-NIR spectrum of the Bi_2S_3@TaO_x-HA nanoparticles

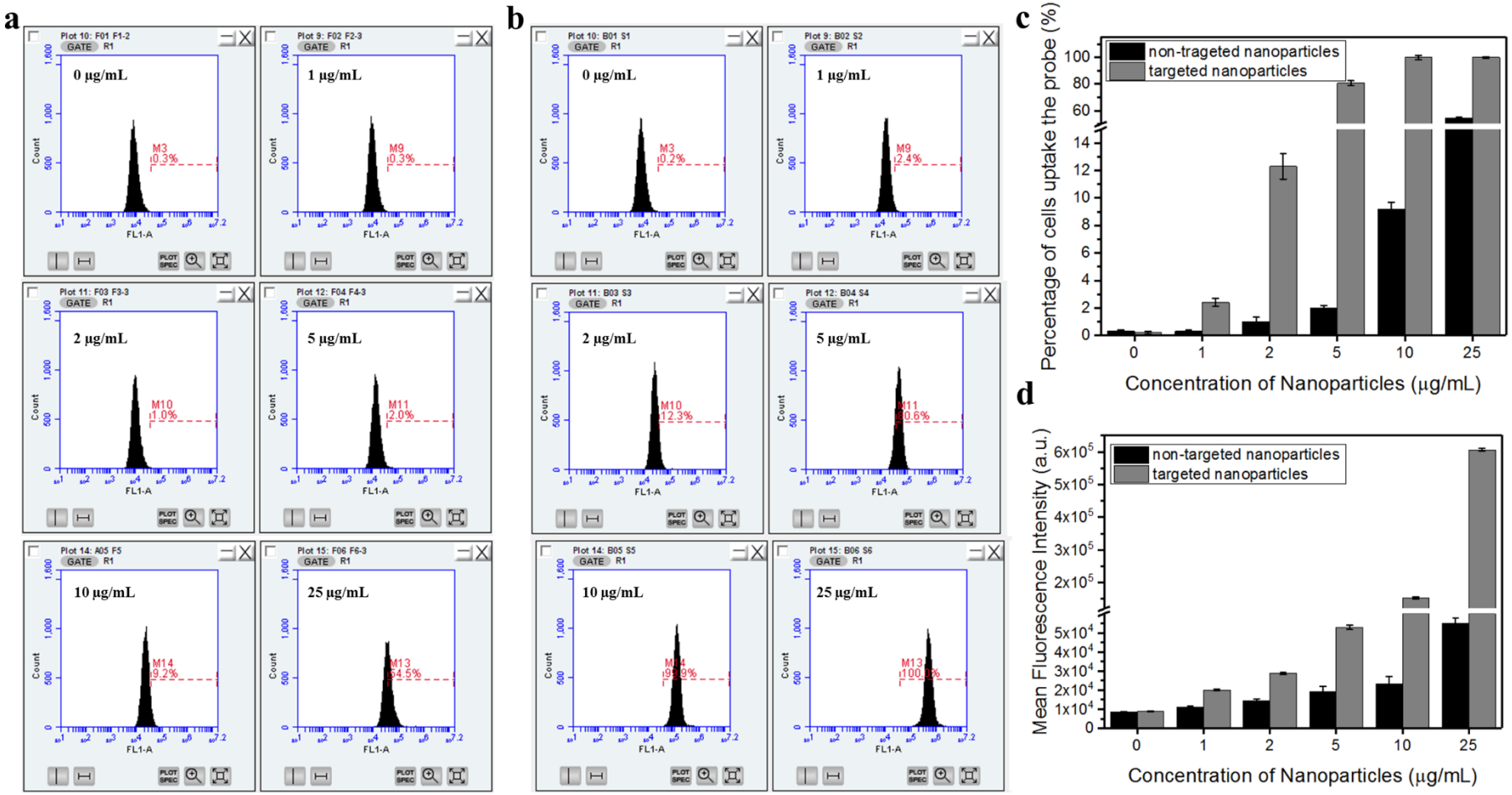

Figure S3. (a-b) Cellular uptake of Bi_2S_3@TaO_x nanoparticles (a) and Bi_2S_3@TaO_x-HA nanoparticles (b) by 4T1 by flow cytometry at 37°C for

4 h; (c) Percentage of cells taking up nanoparticles, (d) Mean fluorescence intensity of the cells