Supporting Information

In-situ **assembled titanium carbide-based heterojunctions for synergistic enhancement of NIR-II photothermal/photodynamic therapy against breast cancer**

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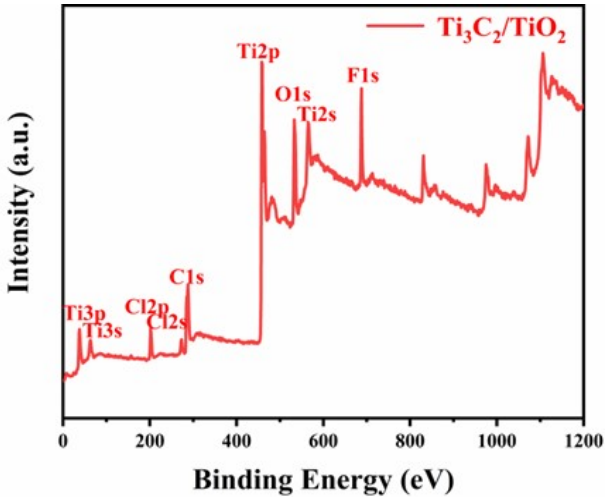

Fig. S1. XPS spectrum Ti_3C_2/TiO_2 in Ti 2p region.

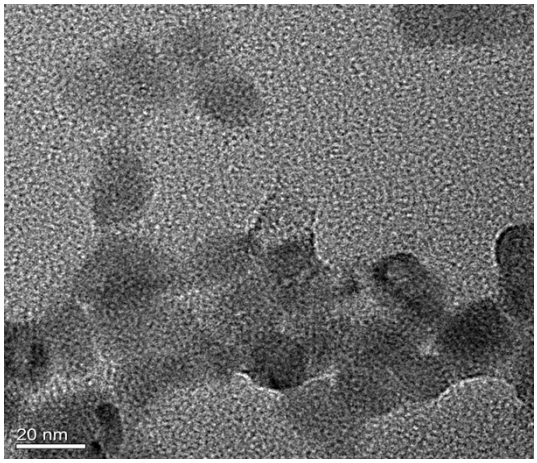

Fig. S2. The morphology of TiO_2 nanoparticles.

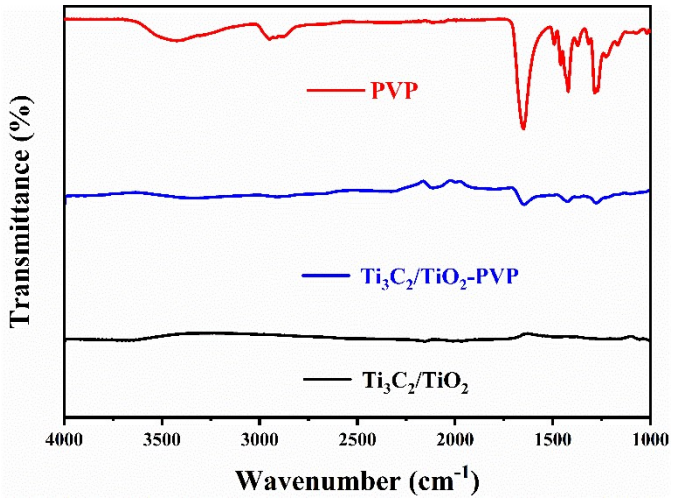

Fig. S3. FITR spectra PVP, Ti_3C_2/TiO_2 and Ti_3C_2/TiO_2-PVP HJs.

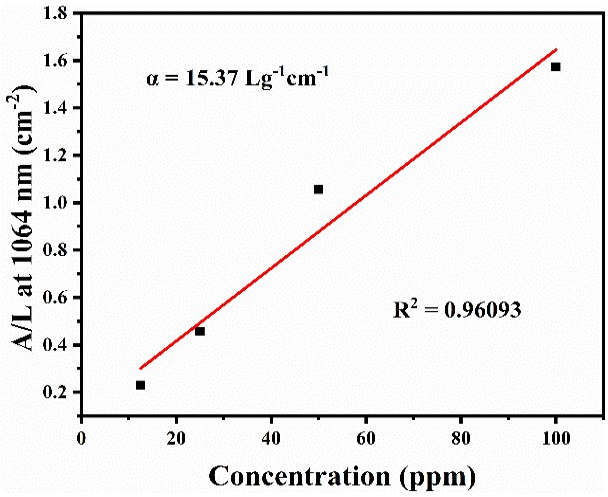

Fig. S4. Mass extinction coefficient of Ti_3C_2/TiO_2-PVP HJs at 1064 nm.

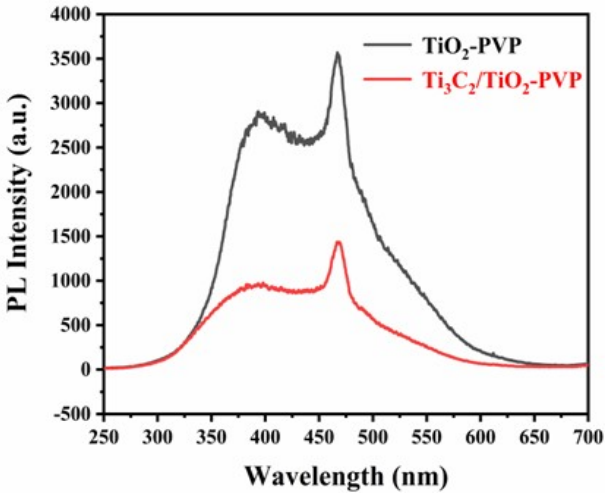

Fig. S5. Fluorescence spectra of TiO_2-PVP and Ti_3C_2/TiO_2-PVP HJs with the same titanium concentration.

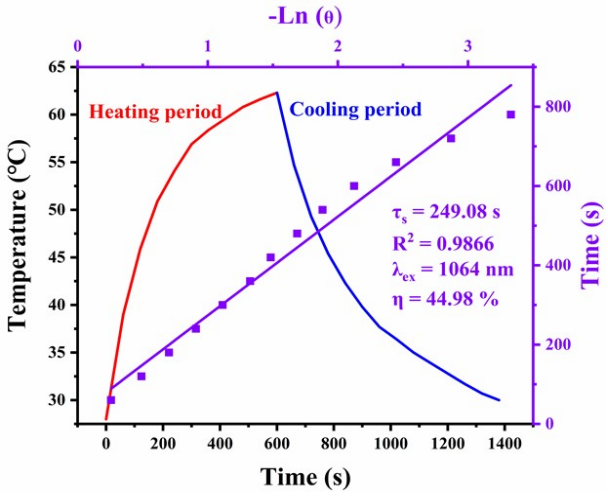

Fig. S6. Calculation of the photothermal-conversion efficiency at 1064 nm (NIR-II). Orange and blue line: photothermal effect of an aqueous dispersion of TiO_2/Ti_3C_2-PVP

under the irradiation with NIR-II laser for certain periods, and then the laser was switched off. Purple line: time constant (τ_s) for the heat transfer from the system determined by applying the linear time data from the cooling period.

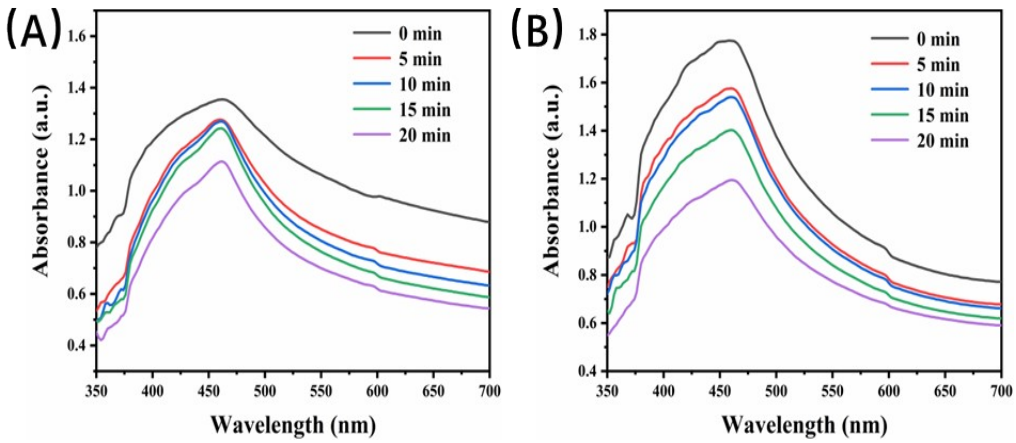

Fig. S7. Time-dependent degradation of DPBF caused by $^1O_2$ generated by TiO_2-PVP (A) and Ti_3C_2-PVP (B), respectively, under laser irradiation (660 nm, 1 W/cm^2, 10 min).

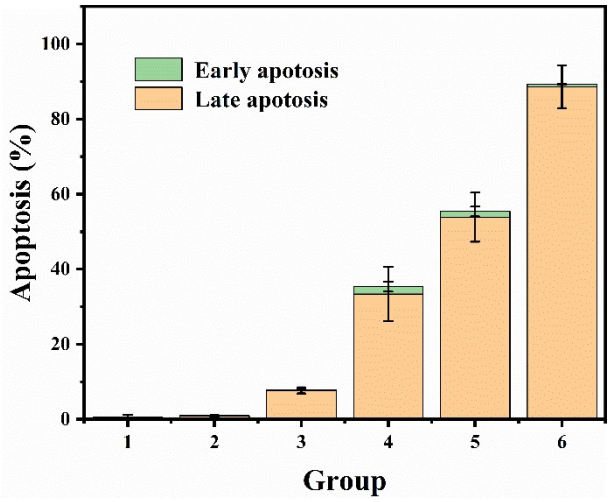

Fig. S8. Cell apoptosis of 4T1 cells after incubated with 0 and 200 ppm concentrations of Ti_3C_2/TiO_2-PVP HJs with 1064 nm irradiation. Note: 1: Control; 2: Only 660 nm; 3: Only 1064 nm; 4: Ti_3C_2/TiO_2-PVP+660 nm; 5: Ti_3C_2/TiO_2-PVP+1064 nm; 6: Ti_3C_2/TiO_2-PVP+660 nm+1064 nm.

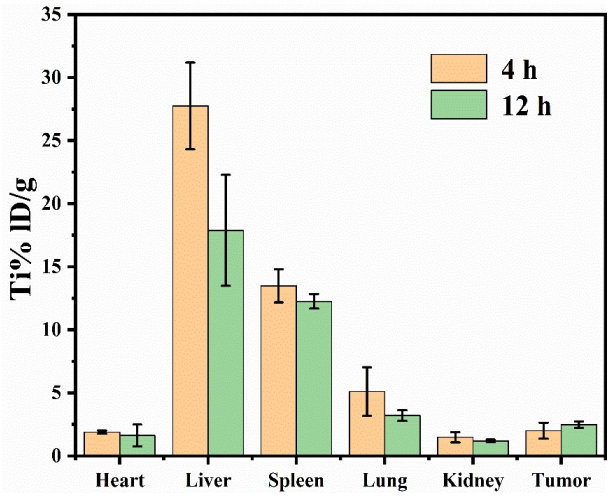

Fig. S9. In vivo Ti bio-distributions after injecting Ti_3C_2/TiO_2 -PVP into female tumor-bearing mice for 4 h, 12 h. Data are expressed mean ± SD (n = 3).

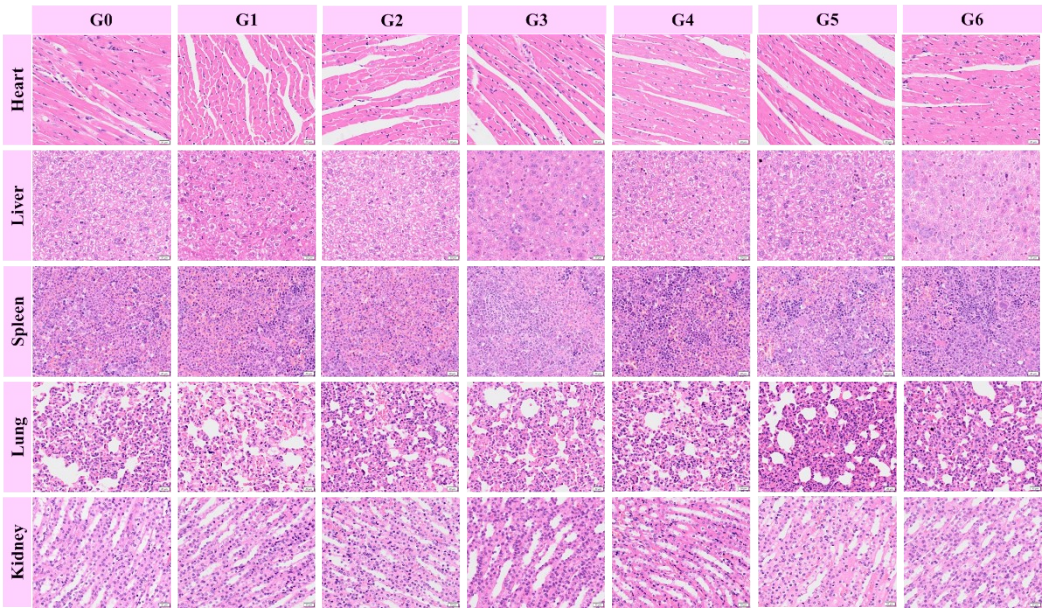

Fig. S10. H&E staining of heart, liver, spleen, lung and kidney from different groups (scale bar = 20 μm). Note: G0: control group (treated only with PBS), G1:1064 nm laser group (only exposed to 1064 nm laser irradiation), G2: 660 nm laser group (only exposed to 660 nm laser irradiation), G3: Ti_3C_2/TiO_2-PVP HJs group (only intravenously injected with Ti_3C_2/TiO_2-PVP HJs), G4: Ti_3C_2/TiO_2-PVP HJs + 660 nm laser group, G5: Ti_3C_2/TiO_2-PVP HJs + 1064 nm laser group, and G6: Ti_3C_2/TiO_2-PVP HJs + 660 and 1064 nm laser group.