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Figure S1. TEM image of AuP, scale bar: 100 nm.



**Figure S2.** Hydrodynamic diameter variation of AuP@MnO<sub>2</sub> dispersed in phosphate buffer at different time points.



Figure S3. X-ray energy dispersive spectroscopy (EDS) of AuP@MnO<sub>2</sub>.



**Figure S4.** Linear relationship between concentration and absorbance of AuP@MnO<sub>2</sub> solutions at (A) 808 and (B) 1064 nm.



**Figure S5.** GSH depletion profile by AuP@MnO<sub>2</sub> with concentrations of (A) 0  $\mu$ g mL<sup>-1</sup>, (B) 12.5  $\mu$ g mL<sup>-1</sup>, (C) 25  $\mu$ g mL<sup>-1</sup>, (D) 50  $\mu$ g mL<sup>-1</sup>, and (E) 100  $\mu$ g mL<sup>-1</sup>. (F) The photograph of the solutions after 60 min of co-incubation.



Figure S6. Relative cell viabilities of 4T1 cells cultured with pure medium, AuP, or  $AuP@MnO_2$  and irradiated by a 1064 nm laser (1.0 W cm<sup>-2</sup>, 5 min).