

Fig. S1 UV-visible spectroscopy of MASAs (in water) and free MA (in DMSO) with equivalent MA concentration (300 $\mu\text{g/mL}$), DMSO and water.

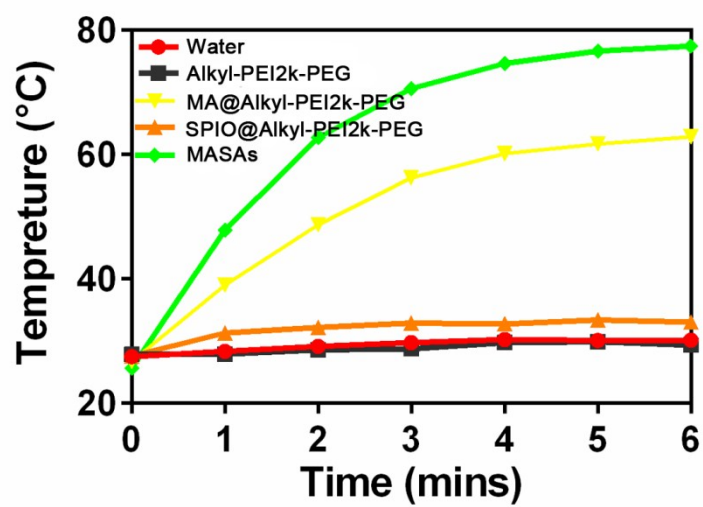


Fig. S2 Temperature rise profiles of water, MASAs and its compositions (Alkyl-PEI2k-PEG, MA@ Alkyl-PEI2k-PEG and SPIO@ Alkyl-PEI2k-PEG) irradiated with 808 nm laser (1 W/cm², 6 min).

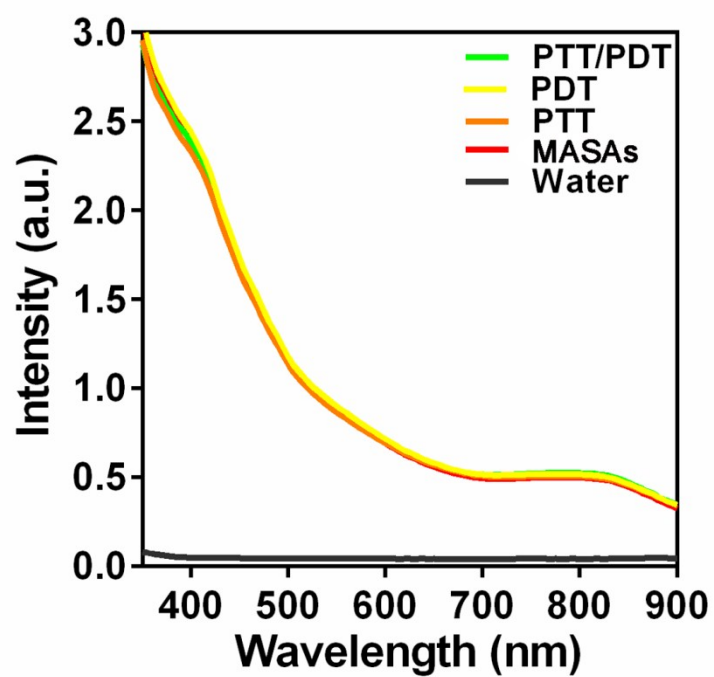


Fig. S3 UV-visible spectroscopy of MASAs before and after different treatments.

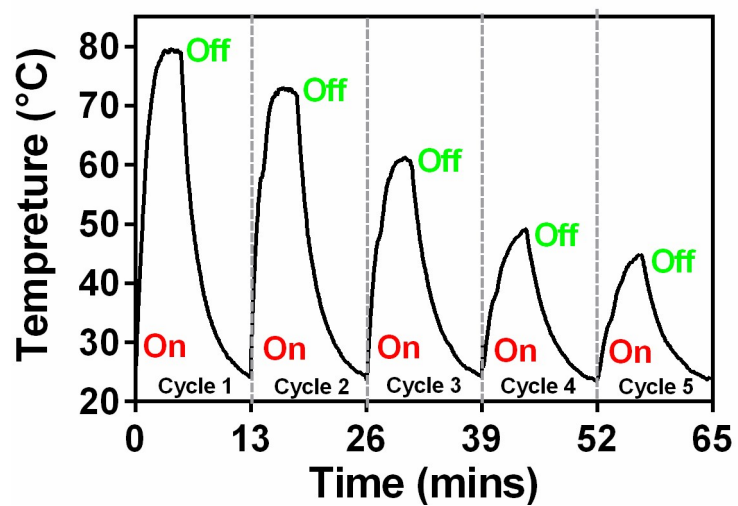


Fig. S4 Temperature profiles of free indocyanine green (ICG) in 5 cycles.

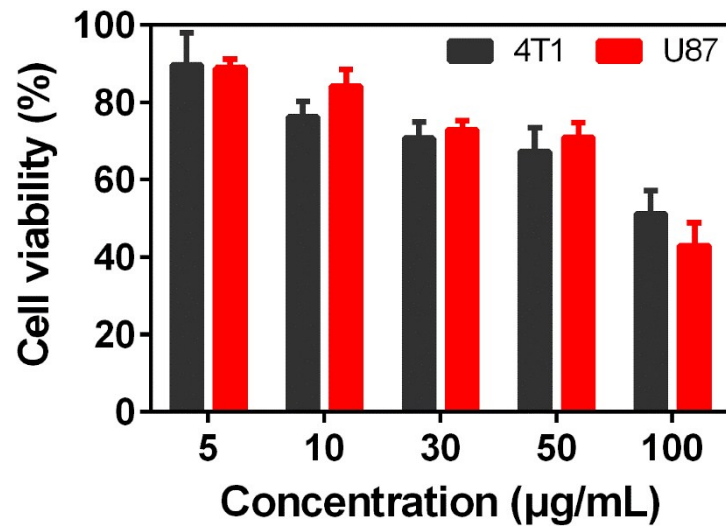


Fig. S5 Cell viabilities of 4T1 and U87 cells treated with different amounts of free MA.

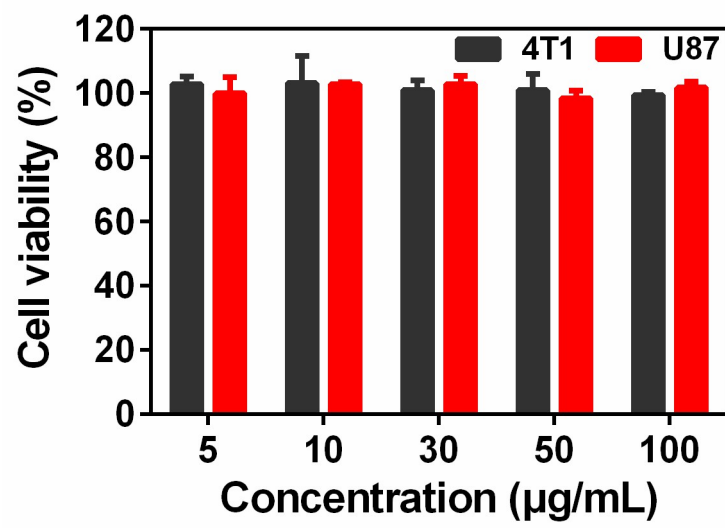


Fig. S6 Cell viabilities of 4T1 and U87 cells treated with different amounts of MASAs.

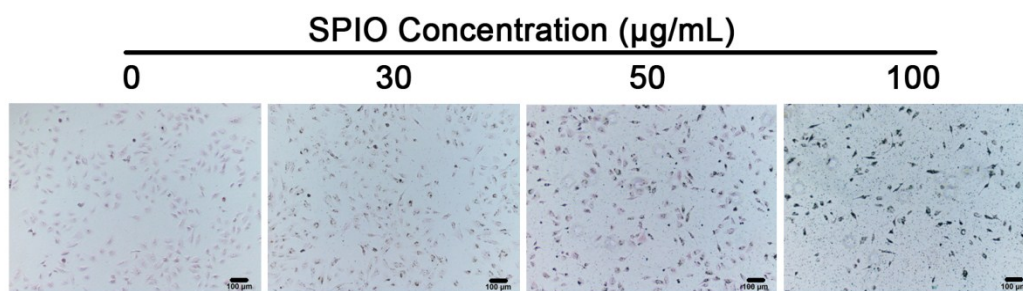


Fig. S7 Iron staining of SCC-7 cells treated with MASAs at different concentrations, scale bar: 100 μm .

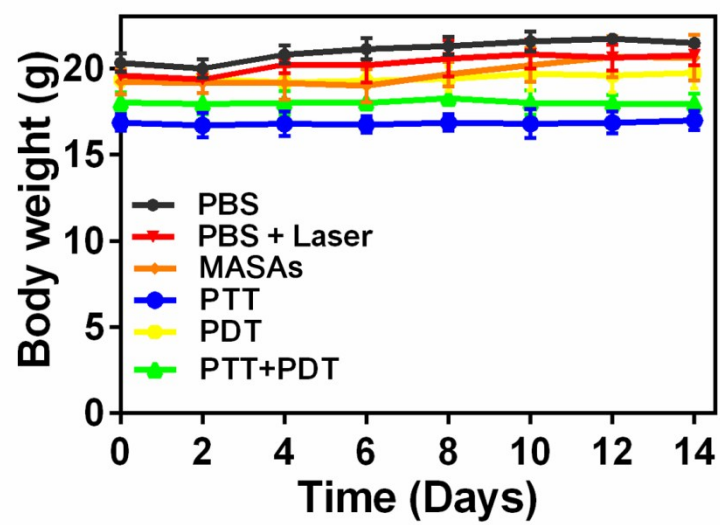


Fig. S8 Mice body weight changes in therapy trial.

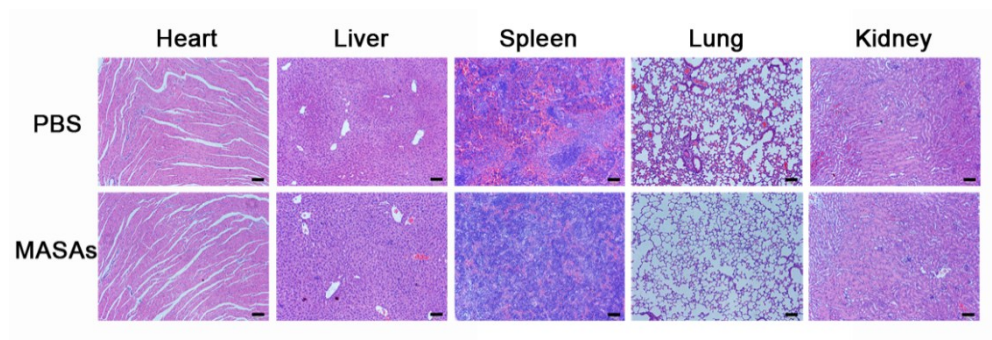


Fig. S9 H&E staining of major organs from mice treated with PBS or MASAs, scale bar: 100 μ m.