# Dual-Cascade Activatable Nanopotentiators Reshaping Adenosine Metabolism for Sono-Chemodynamic-Immunotherapy of Deep Tumors

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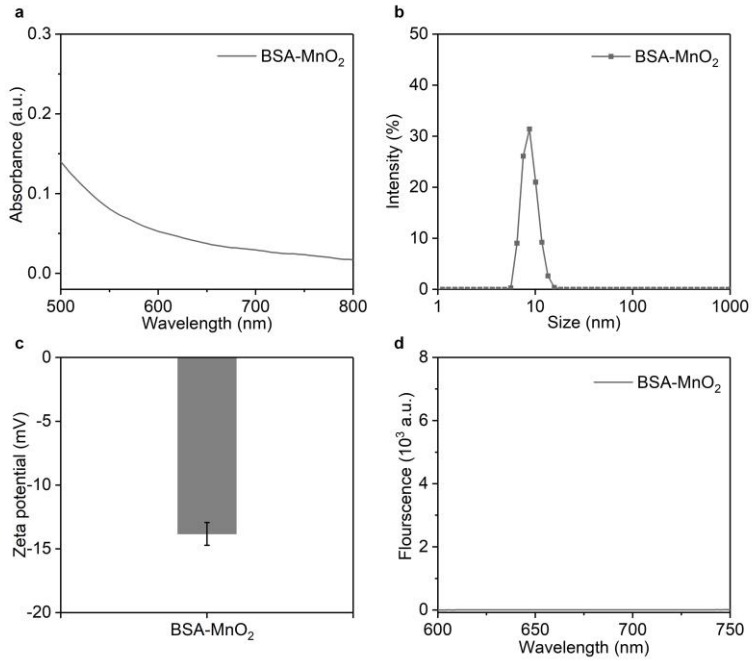


**Figure S1.** (a) UV-vis absorbance spectrum of BSA-$MnO_2$ nanoparticles. (b) Hydrodynamic size of BSA-$MnO_2$ nanoparticles. (c) Zeta potential of BSA-$MnO_2$ nanoparticles (n = 3). (d) Fluorescence spectrum of BSA-$MnO_2$ nanoparticles. The data are presented as the means ± SDs.

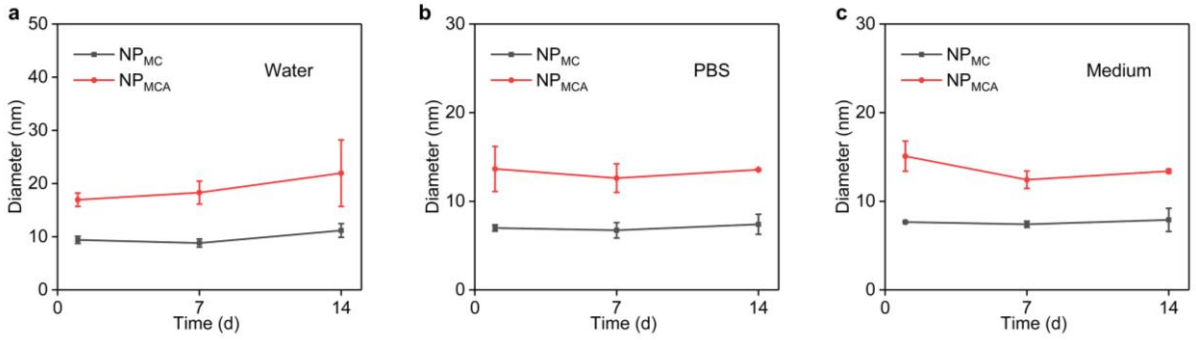


**Figure S2.** Hydrodynamic size of $NP_{MC}$ and $NP_{MCA}$ measured in (a) water, (b) PBS and (c) cell culture medium. The data are presented as the means ± SDs (n = 3).

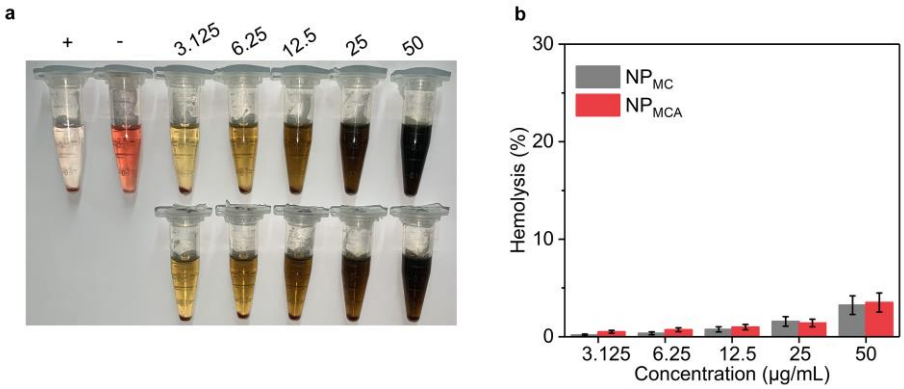


**Figure S3.** (a) Photographs of red blood cells after different treatments and centrifugation. (b) Hemolysis ratio of red blood cells in different treatment groups. The data are presented as the means ± SDs (n = 3).

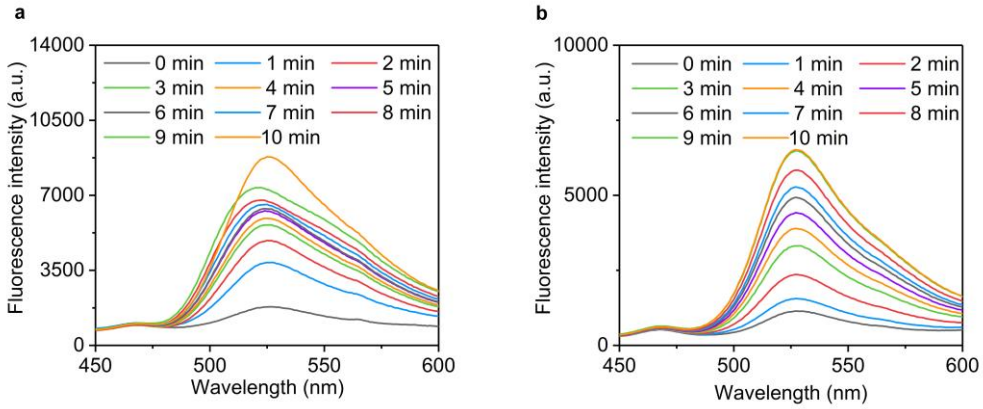


**Figure S4.** (a) Fluorescence spectra of SOSG in solution containing $NP_{MC}$ after US treatment for different time. (b) Fluorescence spectra of SOSG in solution containing $NP_{MCA}$ after US treatment for different time.

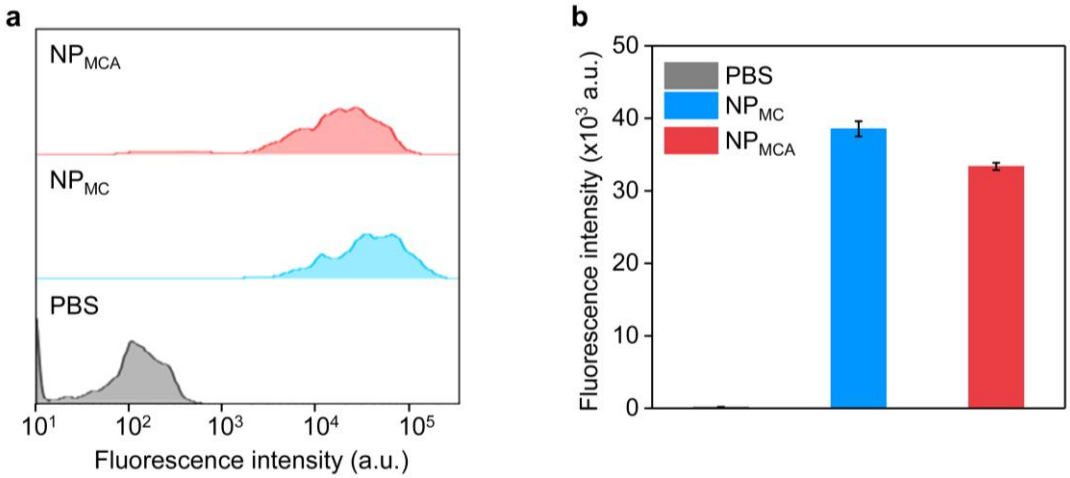

**Figure S5.** (a) Flow cytometry analysis of cellular uptake of $NP_{MC}$ and $NP_{MCA}$ by cancer cells. (b) Fluorescence intenisty of cancer cells after different treatments. The data are presented as the means ± SDs (n = 3).

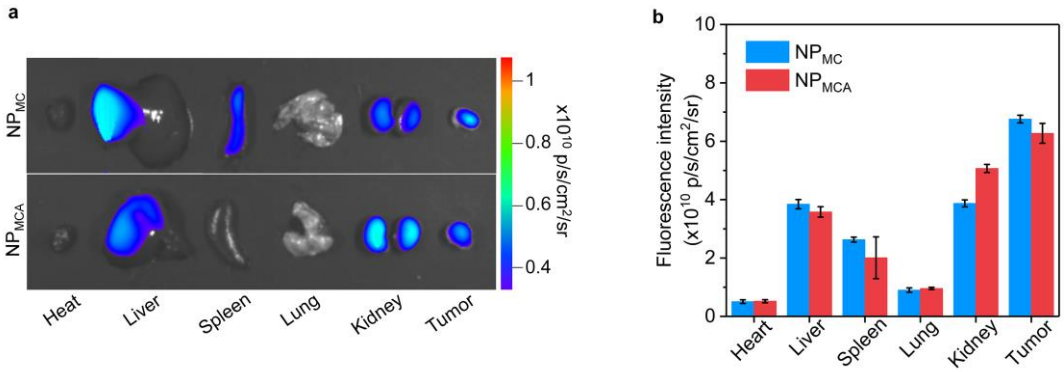


**Figure S6.** (a) Fluorescence images of tumor, liver, kidney, lung, heart and spleen after intravenous injection of $NP_{MC}$ and $NP_{MCA}$. (b) Fluorescence intensity of tumor, liver, kidney, lung, heart and spleen in different mice. The data are presented as the means ± SDs (n = 3).

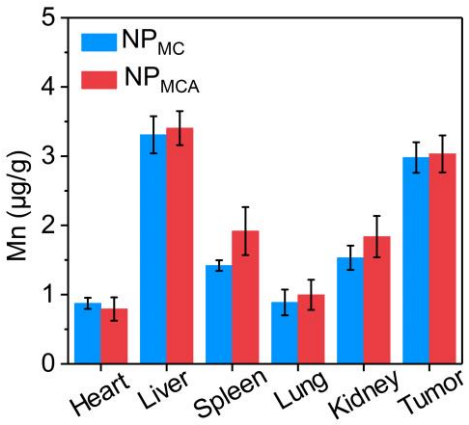


**Figure S7.** Quantitative analysis of Mn in different tissues after intravenous injection of $NP_{MC}$ and $NP_{MCA}$ into living mice. The data are presented as the means ± SDs (n = 5).

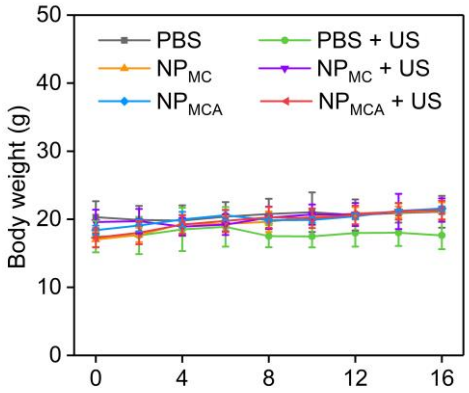


**Figure S8.** Body weight of 4T1 tumor-bearing mice after intravenous injection of $NP_{MC}$ and $NP_{MCA}$ with or without US irradiation at different time. The data are presented as the means ± SDs (n = 5).

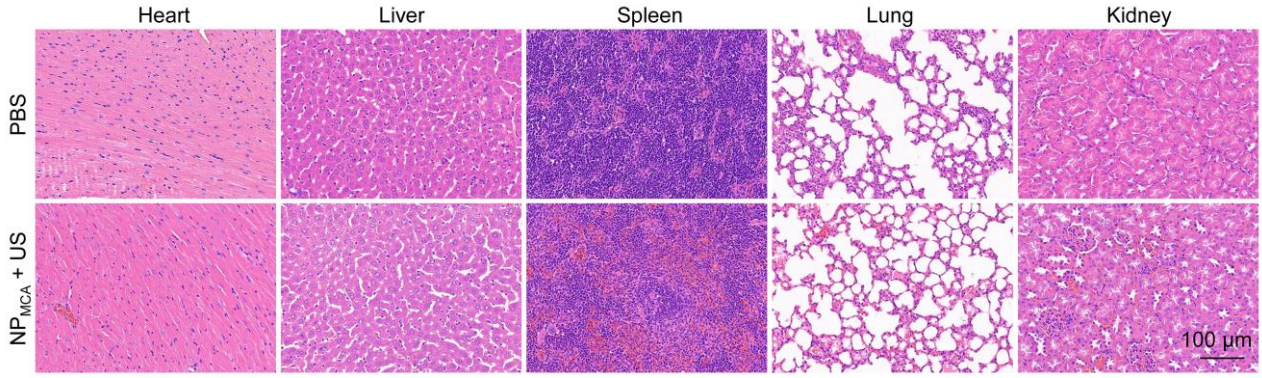


**Figure S9.** H&E staining images of heart, spleen, and kidney of mice after different treatments.