Supporting Information

Dual Responsive Hydrogel with Single-Atom Copper Nanodrug for Precision and Sustained Tumor Therapy

Zhaomin Tang[a,] Yaning Ou[a], Yudong Wang[a], Kanglin Chen[a], Wenxin Liao[a], Junbo Song[a], Yuhua Xiang[a], Pinjia Zhong[a], Dongliang He[a], Donglian Liu[b,*], Qiuye Jin[c,*]*

[a]School of New Energy and Materials, Southwest Petroleum University, Chengdu 610500, China

[b]College of Pharmacy, Chengdu Medical College, Chengdu 610500, China

[c]Carbon Peak and Carbon Neutrality Technology College, Sichuan Technology and Business College, Chengdu 611830, China

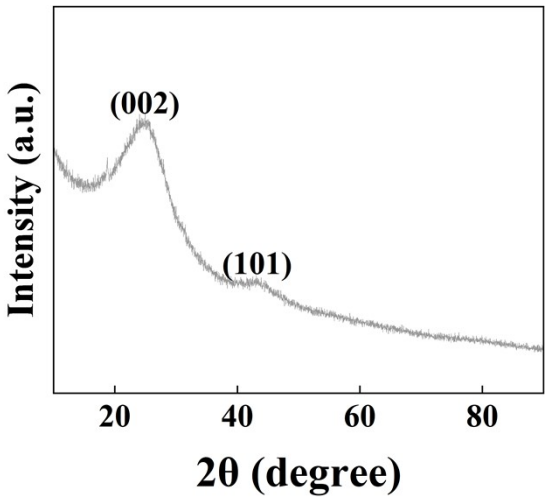

Fig. S1 XRD of Cu-SAC.

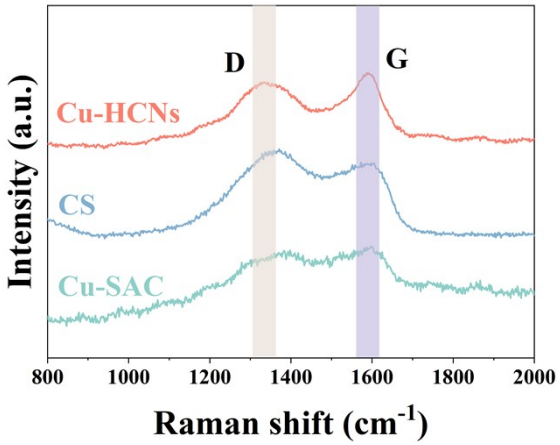

Fig. S2 Raman shift of Cu-HCN, CS and Cu-SAC.

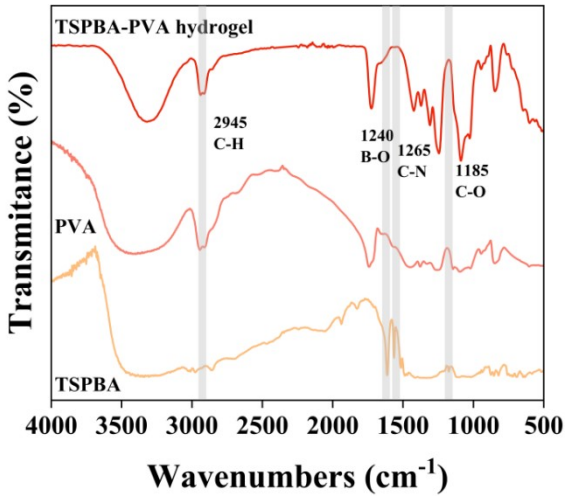

Fig. S3 FTIR of TSPBA, PVA and TP hydrogel.

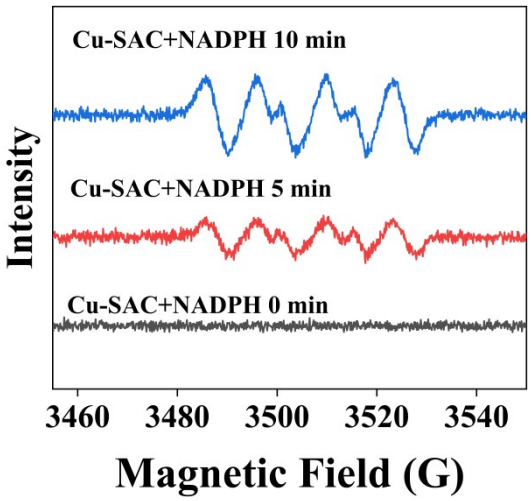

Fig. S4 ESR spectra of $O_2^{\cdot -}$ generated by the reaction of Cu-SAC with NADPH.

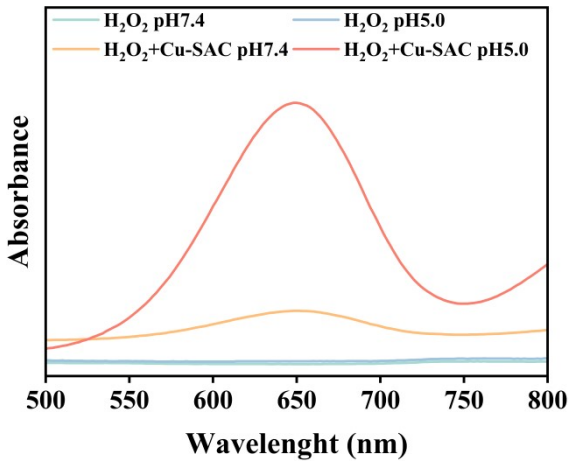

Fig. S5 The oxidation of TMB was investigated through UV-Vis spectroscopy to detect the generation of ·OH from the reaction of Cu-SAC with H_2O_2.

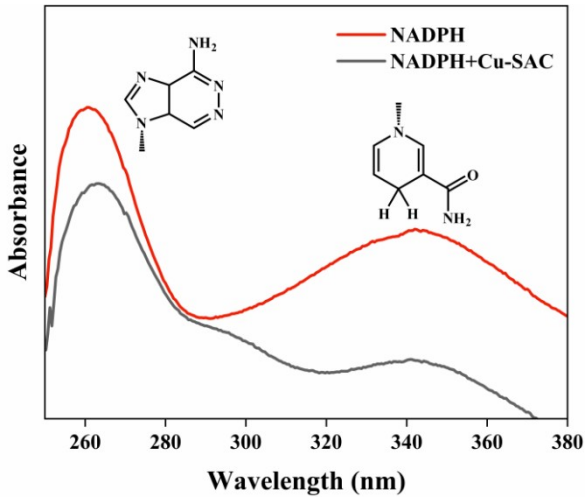

Fig. S6 UV-Vis spectra of Cu-SAC and NADPH.

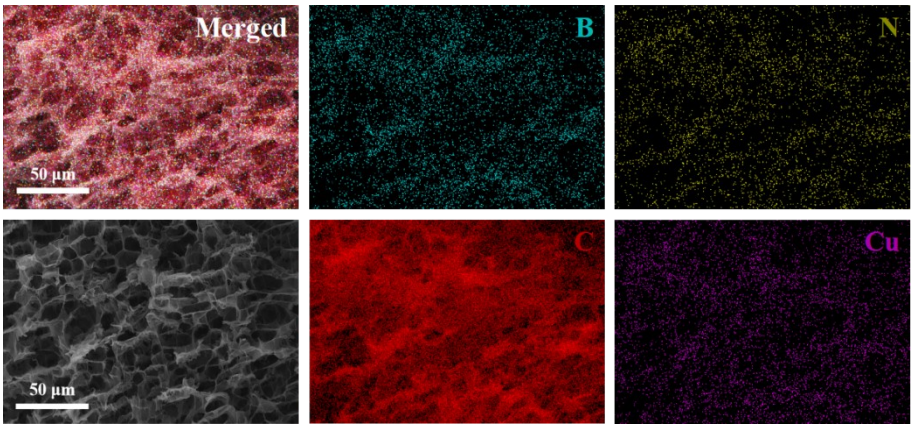

Fig. S7 EDS-Mapping of Cu-SAC@TP.

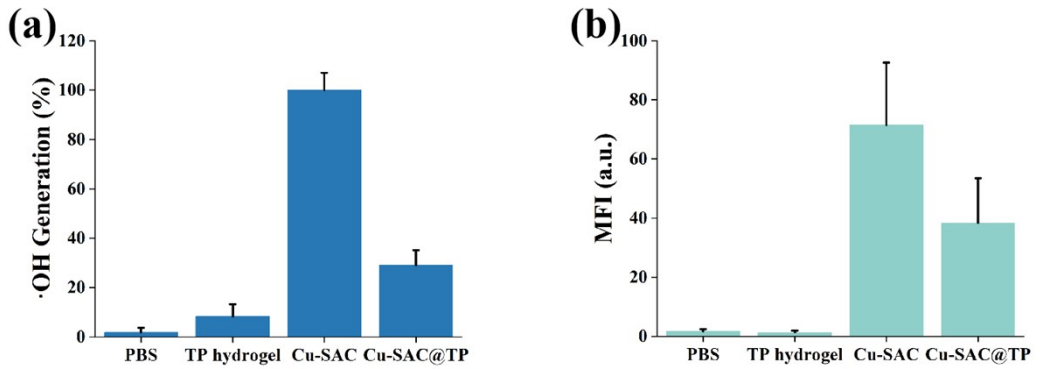

Fig. S8 Semi-quantitative analysis of (a) HPF and (b) SOSG after treatment in different groups.

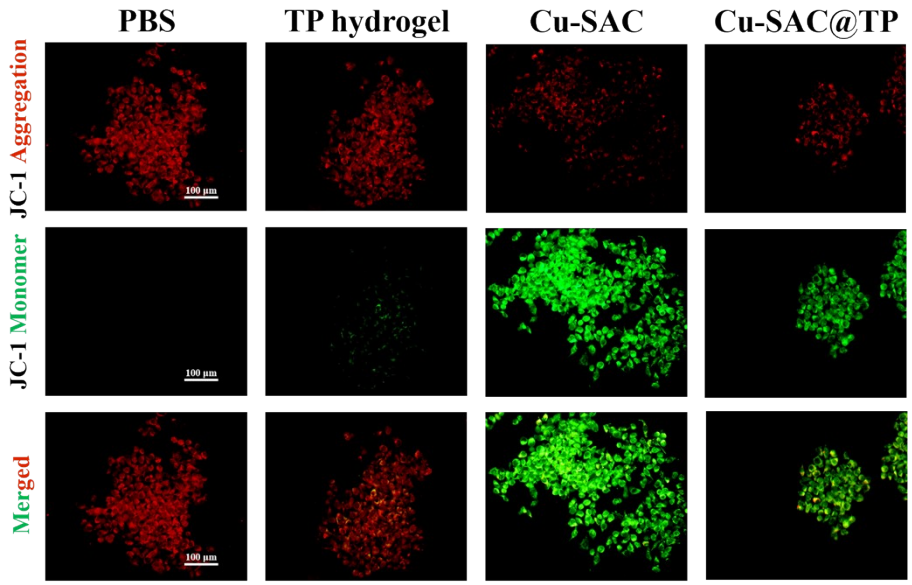

Fig. S9 The changes of mitochondrial membrane potential of 4T1 cells were observed by JC-1 fluorescent probe after treatment in different groups.

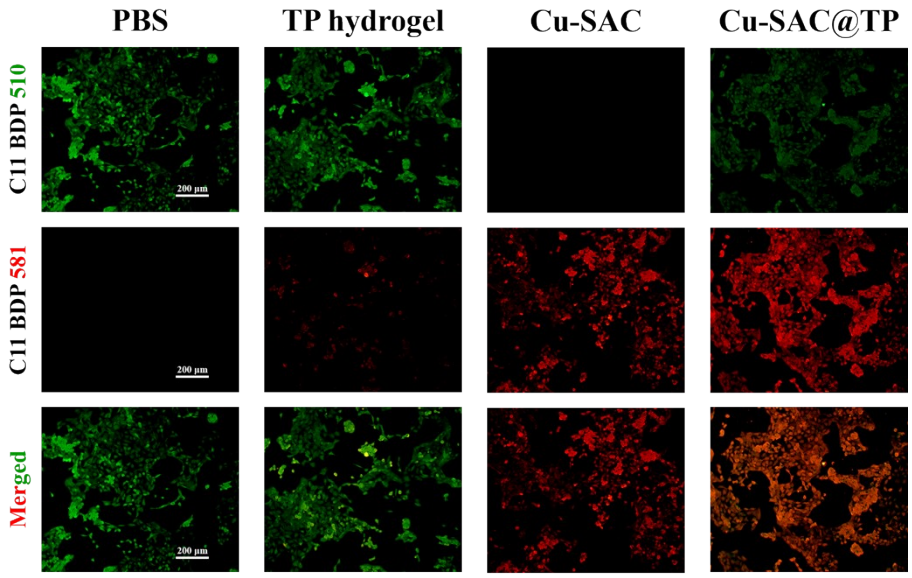

Fig. S10 Lipid peroxidation of 4T1 cells was observed by C11-Bodipy fluorescent

probe after treatment in different groups.

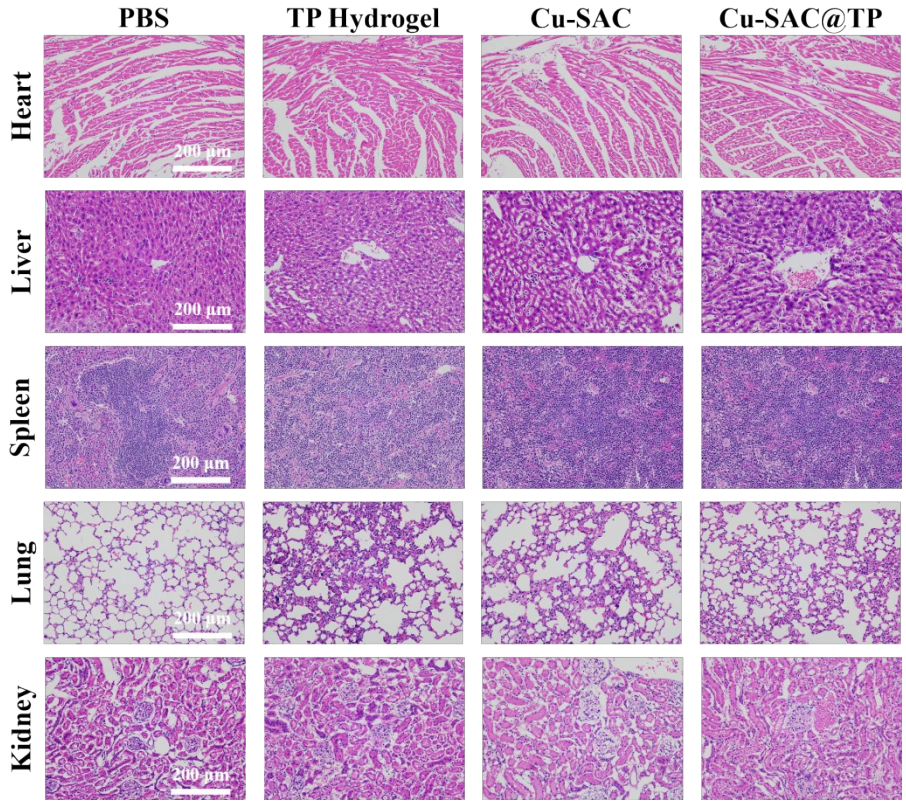

Fig. S11 H&E staining of heart, liver, spleen, lung and kidney after treatment in different groups.

Table S1. Elemental composition of Cu-SAC obtained from XPS and EDS results.

Element	Proportion (%)
C	82.3
N	10.5
O	5.4
Cu	1.8