# Electronic Supplementary Information

## Lactobionic acid modified cobalt coordination polymer-coated peroxymonosulfate nanoparticles generate sulfate/hydroxy dual-radicals for targeted cancer therapy

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## Materials and Instruments

$Co(NO_3)_2 \cdot 6H_2O$ was purchased from Guanghua Sci-Tech Co., Ltd. (China). Imidazole-2-carboxaldehyde was bought from Shanghai Macklin Biochemical Technology Co. Ltd. Sodium oleate was purchased from Shanghai Yuanye Bio-Technology Co., Ltd. Oleamine, PMS and LA were bought from Beijing InnoChem Science & Technology Co., Ltd. N, N-dimethylformamide (DMF) and n-hexane were bought from Chengdu Chron Chemical Co., Ltd. Methylene blue (MB) was purchased from Energy Chemical Reagent Co., Ltd (Anhui, China). 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) was purchased Aladdin-Reagent Co., Ltd. (China). GSH (99 %) and KBr were purchased from Adamas Chemical Reagent Co. Ltd. Fetal bovine serum (FBS), 2',7'-dichlorofluorescein diacetate fluorescent probe (DCFH-DA), and reduced GSH assay kit were purchased from Solarbio Science & Technology Co. Ltd. 5,5-Dimethyl-1-pyrroline N-oxide (DMPO, 97 %) was purchased from Shanghai Macklin Biochemical Technology Co. Ltd. Calcein AM, and propidium iodide (PI) were bought from Beyotime Biotechnology Co., Ltd. C11-BODIPY581/591 was from Wuhan Amgicam Biomedical Technology Co., Ltd. Human GPX4 ELISA kit was from Jiangsu Meibiao Biotechnology Co., Ltd. The reduced GSH and malondialdehyde (MDA) content assay kit were bought from Solarbio Science & Technology Co., Ltd. Annexin V-FITC/PI apoptosis detection kit was from Shanghai YEASEN Biotechnology Co., Ltd. Trypsin was purchased from Leagene Biotechnology Co. Ltd. Penicillin-streptomycin solution was purchased from Beyotime Biotechnology Co. Ltd. Roswell Park Memorial Institute medium (RPMI 1640, Gibco) was purchased from Thermo Fisher Scientific, Inc. Cell cycle and cell apoptosis detection kit was purchased from Labgic Technology Co. Ltd. HepG2 cell line, normal liver (HL7702) cell line, HeLa Human Cervical Cancer Cells (HeLa) cell line, and Mouse Hepatocarcinoma Cells (H22) were purchased from Jiangsu KeyGEN BioTECH Co. Ltd. Female BALB/c mice (4–6 weeks) were purchased from Hunan SJA Laboratory Animal Co. Ltd.

The morphology characterization data was obtained by transmission electron microscopy (TEM) (80 kV, FEI TECNAI G2 SPIRIT BIO, USA). Scanning electron microscope (SEM) images were obtained from FEI Nova Nano SEM-450. SEM Elemental mapping was obtained by Oxford Instruments Ultim Max 65. Malvern Instruments Limited ZEN3600 (Malvern, UK) was used to conduct dynamic light scattering (DLS) measurement. Ultraviolet and visible spectrophotometry (UV-vis) spectra were recorded with Shimadzu 1750 UV-visible spectrophotometer (Japan).

Fourier Transform infrared spectroscopy (FTIR) and electron spin resonance (ESR) was acquired with a Vetex70 instrument with the KBr pellet and EMXmicro (Bruker, Germany). ICP-OES analysis was conducted on an Agilent 5110 instrument. Thermo Scientific K-Alpha+ X-ray photoelectron spectrometer (ThermoFisher, USA) was employed for XPS analysis. Flow cytometry (FCM) analysis and confocal Laser Scanning Microscope (CLSM) analysis utilized a BD FACSAria™ III (BD, USA) and CLSM (Andor REVOLUTIONWD, UK).

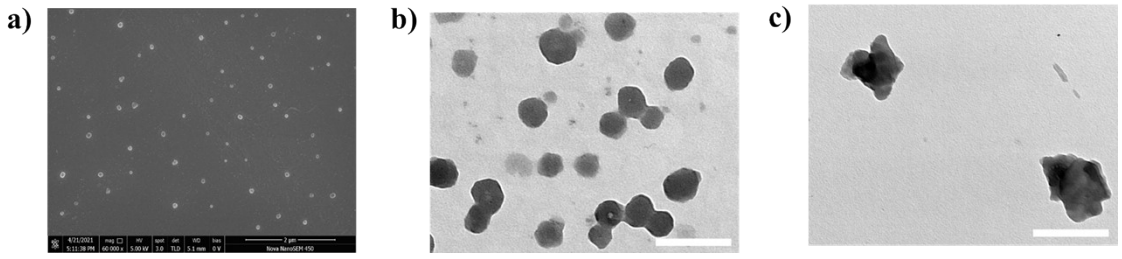


Fig. S1 a) SEM images of PMS NPs. Scale bar: 2 μm. b) TEM images of PMS NPs, Scale bar: 500 nm. c) TEM images of Co-CPP NPs. Scale bar: 200 nm.

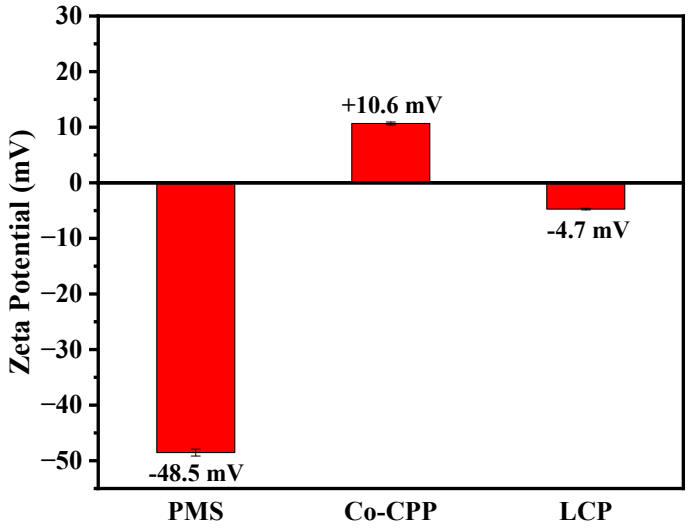


Fig. S2 Zeta potentials of PMS, Co-CPP, and LCP. Data are expressed as mean ± SD (n = 3).

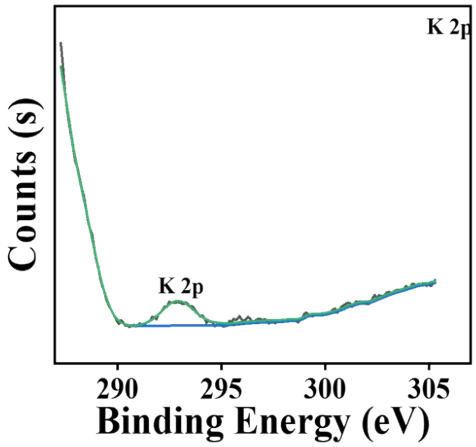


Fig. S3 High resolution XPS spectra of K 2p.

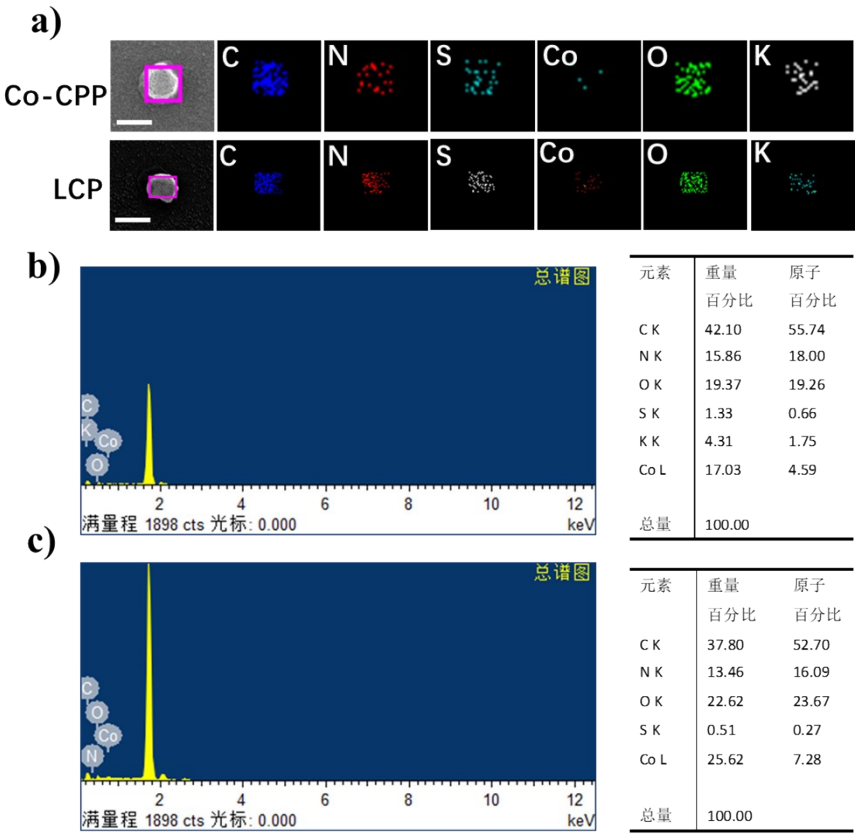


Fig. S4 a) SEM image and corresponding elemental mapping of Co-CPP and LCP (Scale bar: 200 nm), b) EDS spectrum of Co-CPP, c) EDS spectrum of LCP.

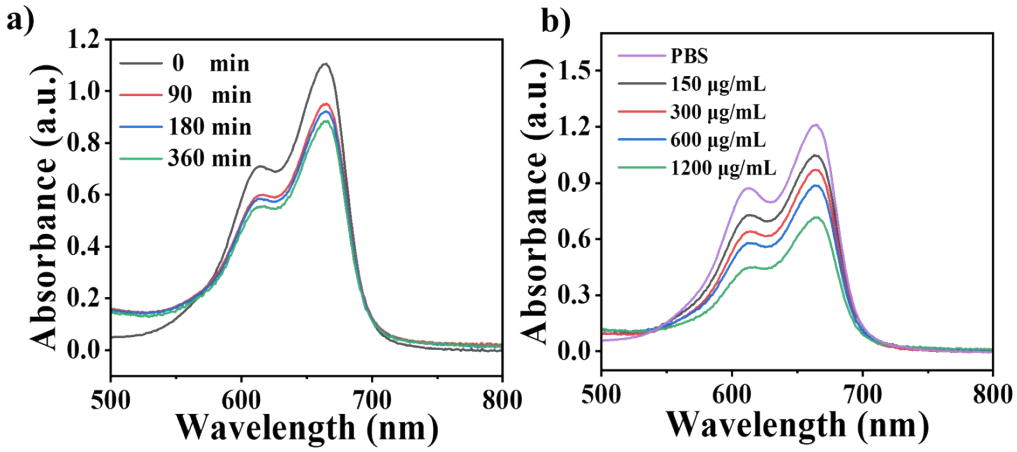


Fig. S5 a) Degradation of MB under different times with LCP (600 μg/mL). b) Degradation of MB in pH 6.0 PBS with the presence of different concentrations of LCP.

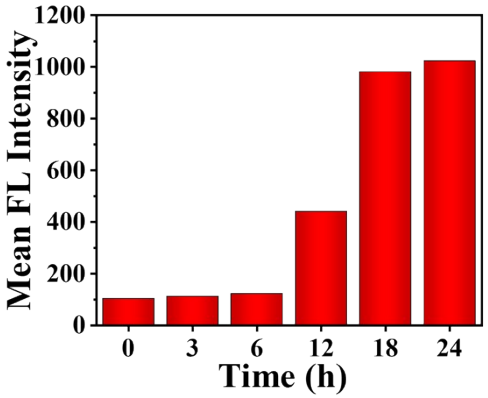


Fig. S6 Quantification of FCM analysis.

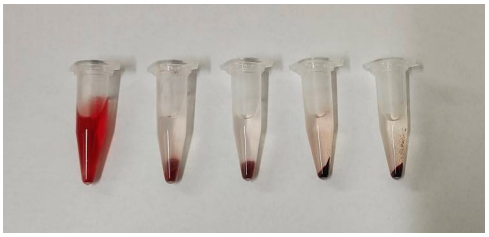

Fig. S7 The photograph of red blood cell hemolysis. (a) $H_2O$ (b) PBS (c) 167 μg/mL PMS (d) 1236 μg/mL Co-CP (e)1200 μg/mL LCP.

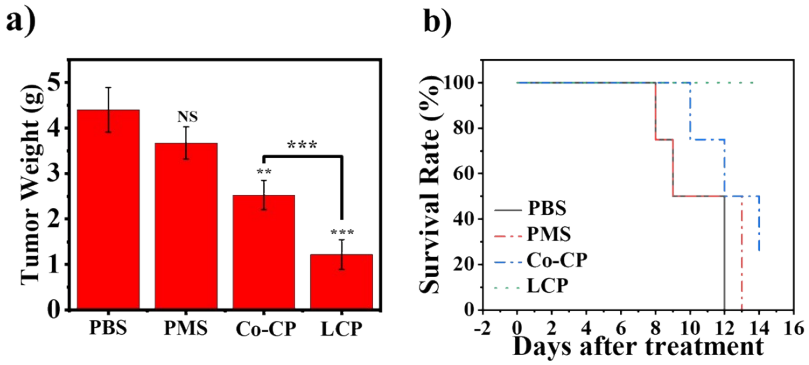


Fig. S8 a) Weights of isolated tumors of different groups (PBS, PMS, Co-CP, and LCP) on the fourteenth day (n = 4), b) Survival curves of different groups (PBS, PMS, Co-CP, and LCP) in 14 days (n = 4).

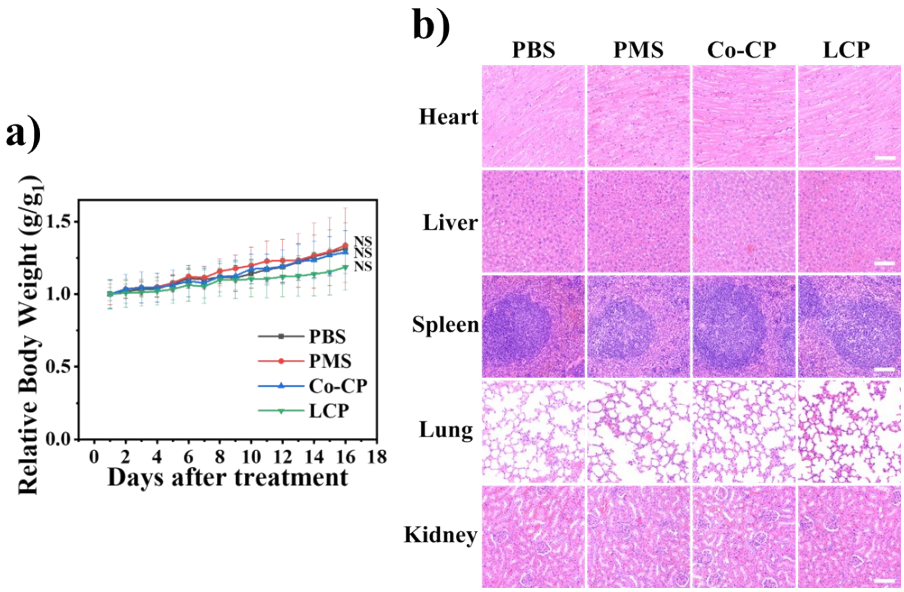


Fig. S9 a) Relative body weight curves of different groups (PBS, PMS, Co-CP, and LCP; n = 4). b) Photographs of heart, liver, spleen, lung, and kidney tissue sections after H&E staining (Scale bar: 100 μm).