Electronic Supplementary Information

of

A Modular Theranostic Platform for Tumor Therapy and its Metabolic Studies

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Materials: *p*-methyl benzene sulfonic chloride (*p*-TsCl), dimethyl formamide (DMF), *β*-cyclodextrin (*β*-CD), sodium hydroxide (NaOH), acetone, hydrochloric acid (HCl), methanol, trimethylamine (TEA), ethylsilicate (TEOS), toluene, ethyl acetate, hexadecyl trimethyl ammonium bromide (CTAB), and hydrofluoric acid were purchased from Shanghai Reagent Chemical Co. (China). Ethanediamine (EDA), amidotrizoic acid, tetrabutylammonium iodide, 1H-Benzimidazole-5-carboxylic acid, 3-chloropropyltriethoxysilane, ferrocenecarboxylic acid (FA), diamine polyethylene glycol (M_w=1000), and ethylene diamine tetraacetic acid (EDTA) were purchased from Aladdin Industrial Corporation. Tri-tert-butyl 1,4,7,10-Tetraazacyclododecane-1,4,7,10-triacetate (t-Bu-DOTA) was purchased from TCI (Shanghai) Development Co., Ltd. *N*, *N*-Diisopropylethylamine (DIEA), *N*-Hydroxybenzotriazole (Hobt), and benzotriazol-1-yl-oxytripyrrolidinophosphonium hexafluorophosphate (Pybop) were purchased from Glbiochem (Shanghai) Ltd. DMF, TEA, and toluene were redistilled before used. Doxorubicin hydrochloride (DOX) was purchased from Zhejiang Hisun Pharmaceutical Co. (China). Other reagents were purchased from Shanghai Reagent Chemical Co., Ltd (China) and used as received.

Characterizations: Transmission electron microscopy (TEM) images were carried out on a JEM-2100 (JEOL) transmission electron microscope. Confocal microscopy images were performed on a C1-Si (Nikon) confocal laser scan microscope(CLSM). Zeta potential was determined by a zeta sizer (Malvern). Fourier transform-infrared spectroscopy (FT-IR) was recorded on KBr pellets by means of a Spectrum Two FT-IR Spectrophotometer (Perkin-Elmer). The fluorescence of DOX was detected using a fluorescence spectrophotometer photometer (Perkin-Elmer). ^{1}H-NMR spectra were obtained on a Mercury VX-300 spectrometer (Varian) with D_2O and DMSO-d_6 as the solvent. Image acquisition of the *in vivo* drug distribution was performed by a small

animals living imaging system (maestro). *In vivo* ^{1}H-MRS was preferred on a 7.0 T magnetic resonance imaging equipment.

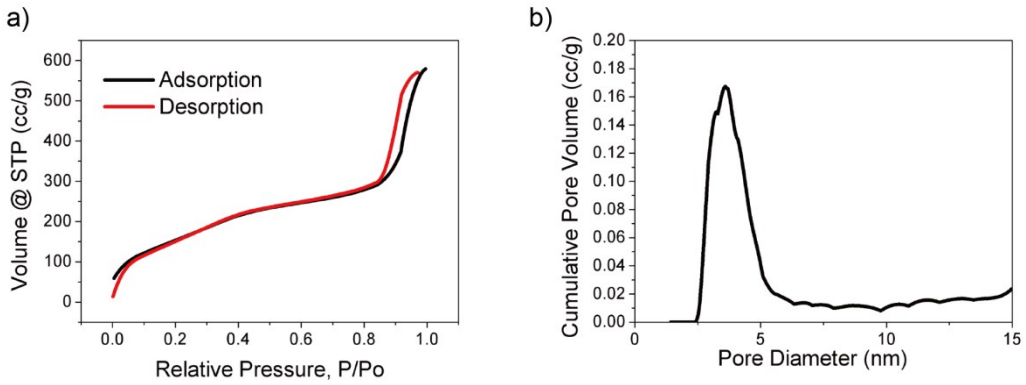

Fig. S1. BET nitrogen adsorption/desorption isotherms (a) and BJH pore size distribution (b) of MSN nanoparticles.

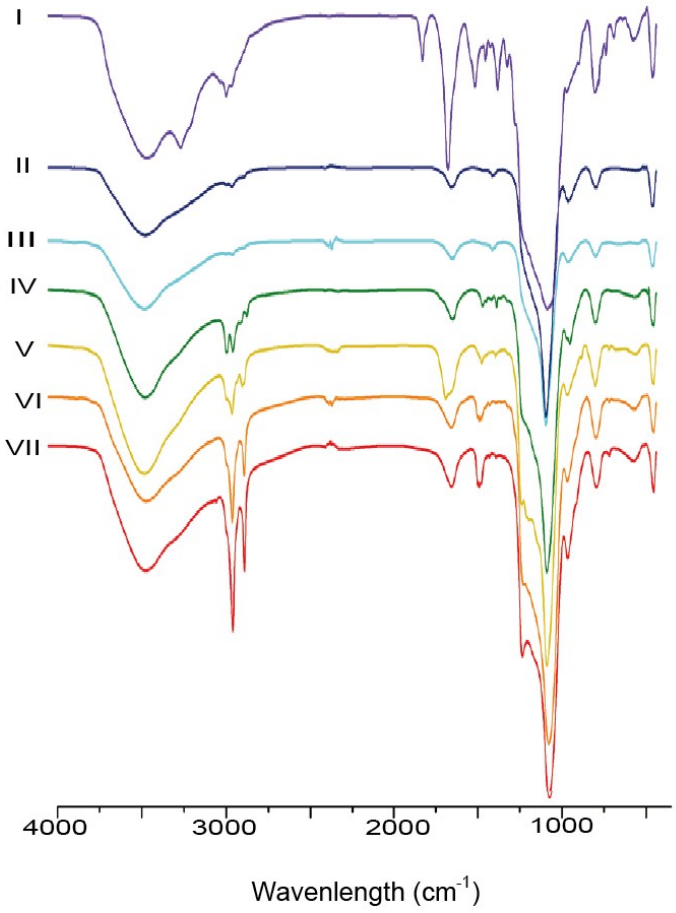

Fig. S2. FT-IR spectrum of modified MSN(I: CTAB@MSN; II: MSN; III: Cl-MSN; IV: Bz-MSN; V: PEG-Bz-MSN; VI: Fc-PEG-Bz-MSN; VII: β-CD-MSN).

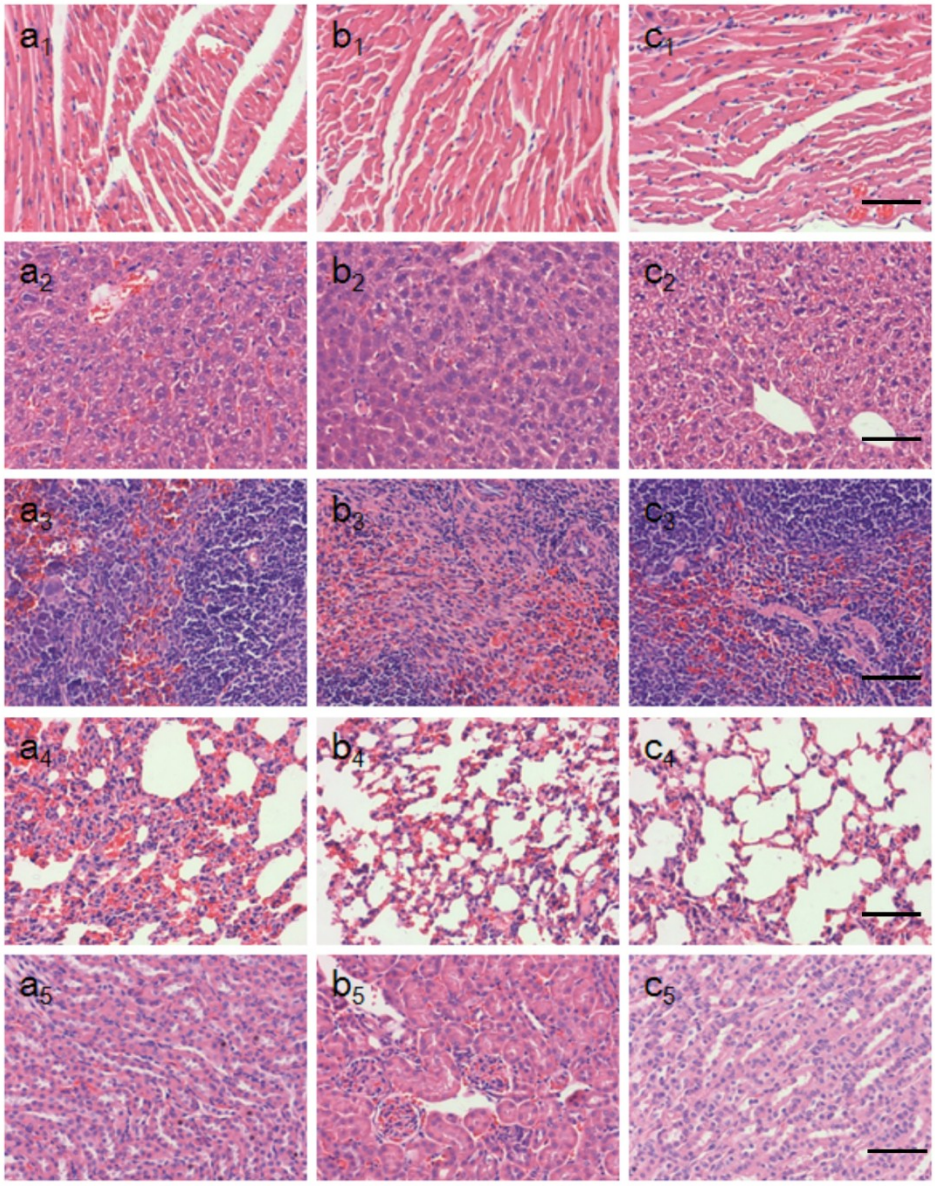

Fig. S3. H&E staining of tissues treated with (a) PBS, (b) DOX and (c) DOX@FAMSN. Image 1: heart; Image 2: liver; Image 3: spleen; Image 4: lung; Image 5: kidney (×200). Scale bar: 100 μm.

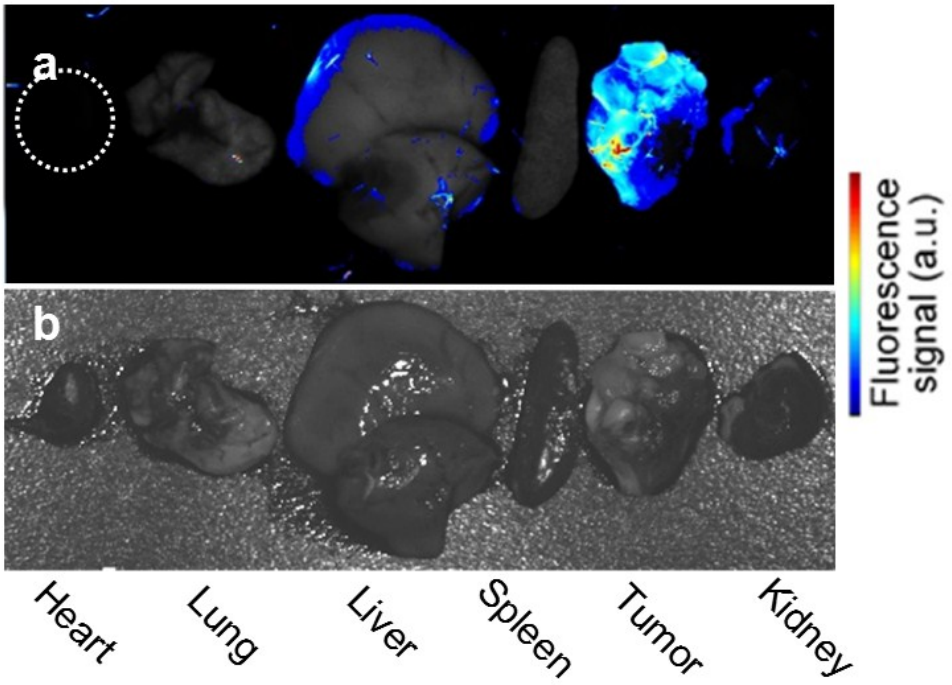

Figure S4. (a) Fluorescence field for heart (as circled), lung, liver, spleen, tumor and kidney. (b) Bright field for heart, lung, liver, spleen, tumor and kidney.