Supporting Information

Polymeric $^{1}H/^{19}F$ Dual-modal MRI Contrast Agent with Snowman-like Janus Nanostructure

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Table S1. SNP synthesis condition and DLS/zeta potential characterization results.

Name	Reactants					Diameter (nm)	Zeta Potential (mV)
	DIMA (mL)	St (mL)	DSDA (μL)	NaVBS (mg)	KPS (mg)		
SNP-1	3.6	0.9	45	110	50	118 ± 36	-54 ± 1
SNP-2	2.25	2.25	45	110	50	59 ± 17	-45 ± 2
SNP-3	4.5	0	45	110	50	123 ± 39	-40 ± 1

Table S2. JNP synthesis condition and DLS/zeta potential characterization results.

Name	Reactants			Diameter (nm)	Zeta Potential (mV)
	SNP-1 (g)	TPMA (mL)	3-TMSPMA (mL)		
JNP-1	0.5	0.3	0.7	157 ± 50	-61 ± 2
JNP-2	0.5	0.4	0.6	197 ± 71	-22 ± 2
JNP-3	0.5	0.5	0.5	331 ± 66	-28 ± 1

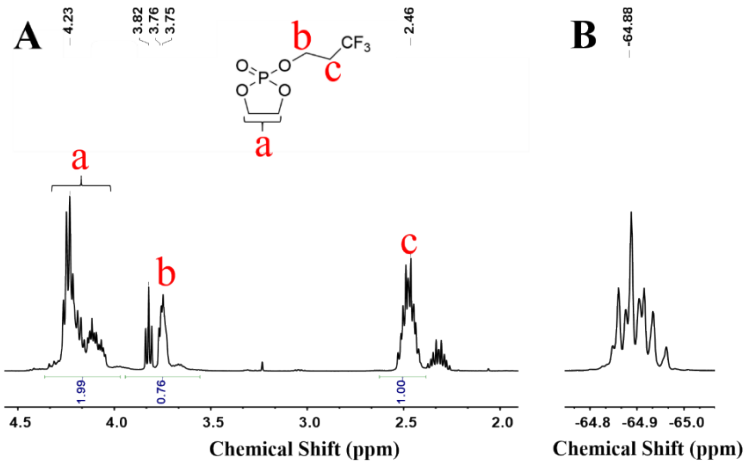

Figure S1. NMR spectrums of FCP in $CDCl_3$. (A) ^{1}H NMR spectrum and (B) ^{19}F NMR spectrum.

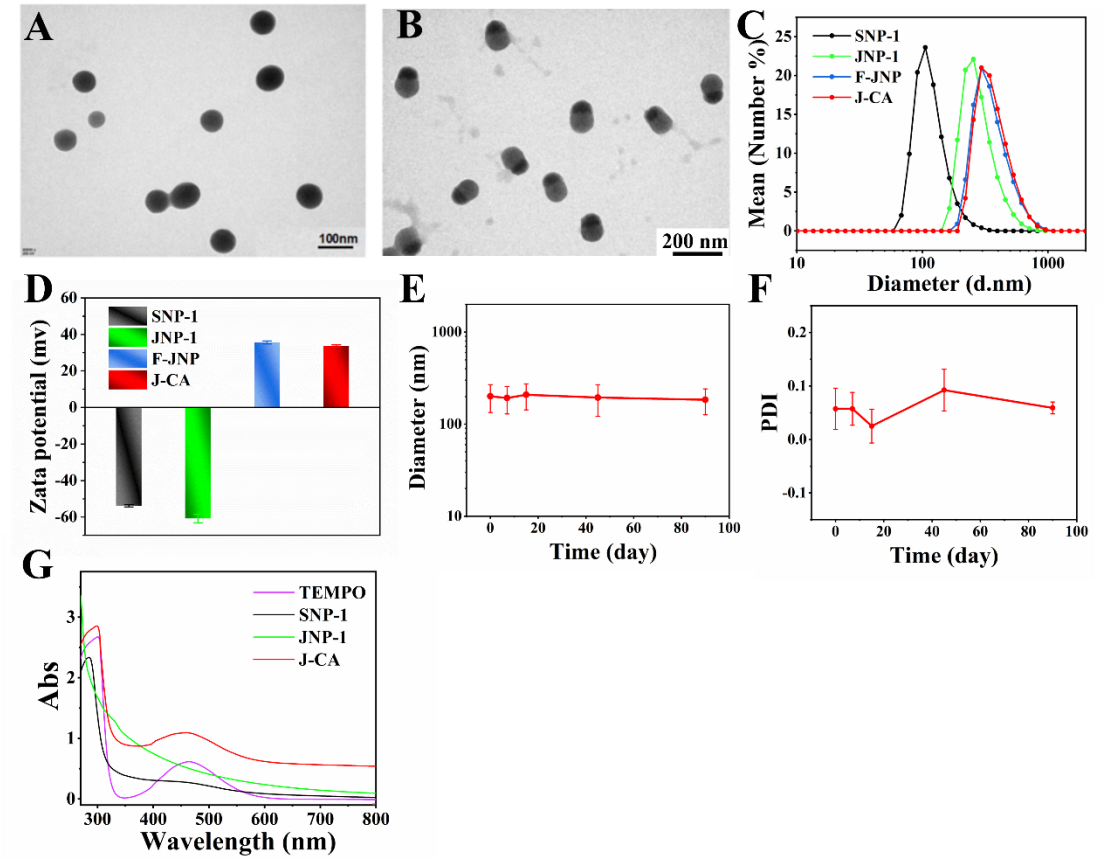

Figure S2. The characterization result of SNP-1, JNP-1, F-JNP and J-CA. (A) TEM image of SNP-1. (B) TEM image of JNP-1. (C) Hydrodynamic values of SNP-1, JNP-1, F-JNP and J-CA in aqueous solution. (D) Zeta potential values of SNP-1, JNP-1, F-JNP and J-CA in aqueous solution. (E) Hydrodynamic diameter values of J-CA in aqueous solution in 90 days. (F) Polydispersity values of J-CA in aqueous solution in 90 days. (G) Uv-vis spectrum of TEMPO, SNP-1, JNP-1 and J-CA in aqueous solution.

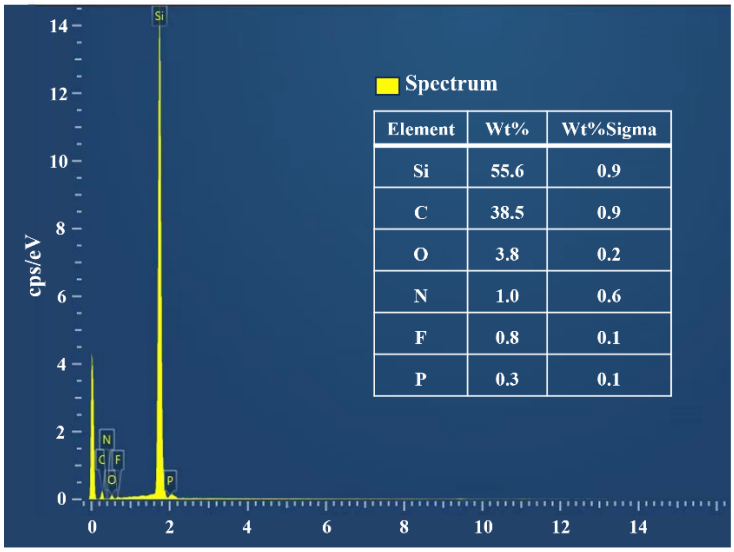

Figure S3. EDX spectrum result of J-CAs.

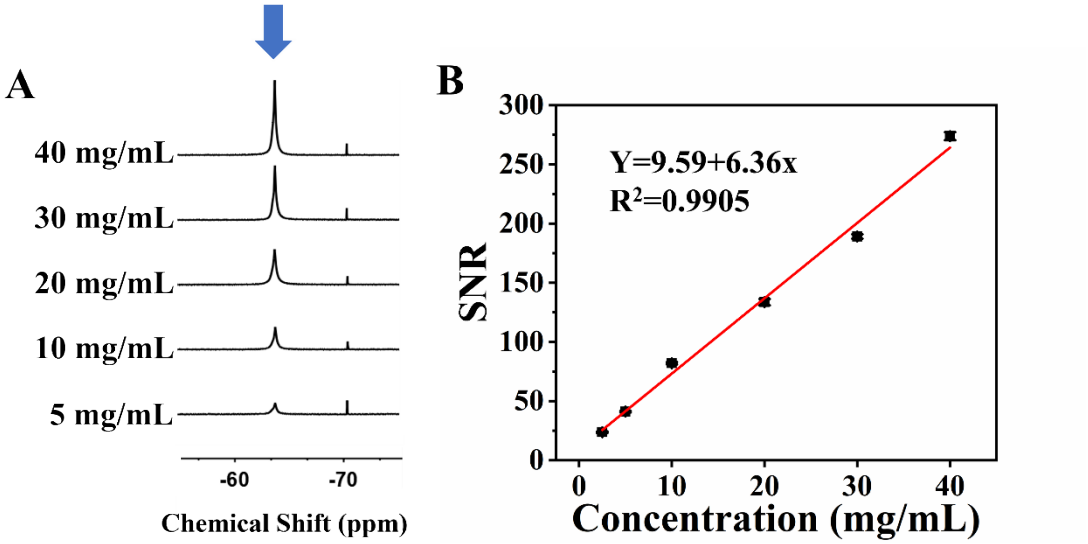

Figure S4. ^{19}F NMR spectrum of J-CA in D_2O/H_2O (1/9, v/v) at concentration of 5-40 mg/mL.

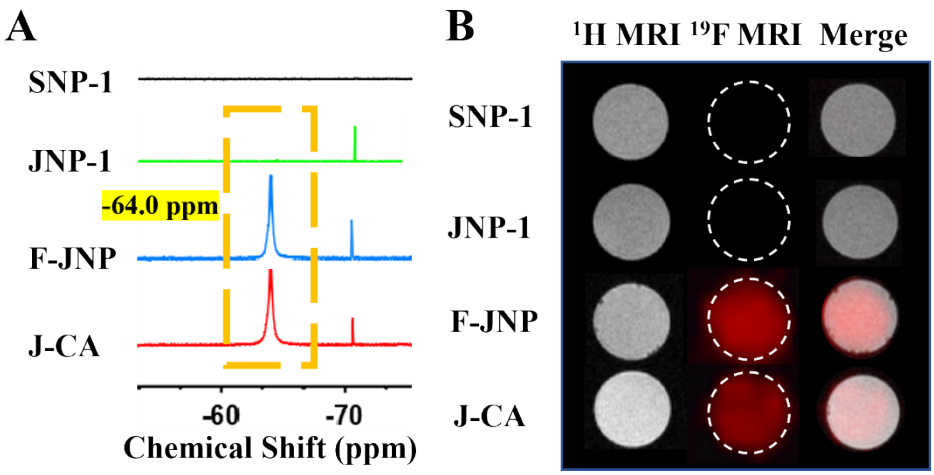

Figure S5. (A) ^{19}F NMR spectrum of SNP-1, JNP-1, F-JNP and J-CA in D_2O/H_2O (1/9, v/v) at concentration of 10 mg/mL. (B) T_1-weighted ^{1}H MRI and ^{19}F "hot spot" MRI images of SNP-1, JNP-1, F-JNP and J-CA in D_2O/H_2O (1/9, v/v) at concentration of 20 mg/mL.

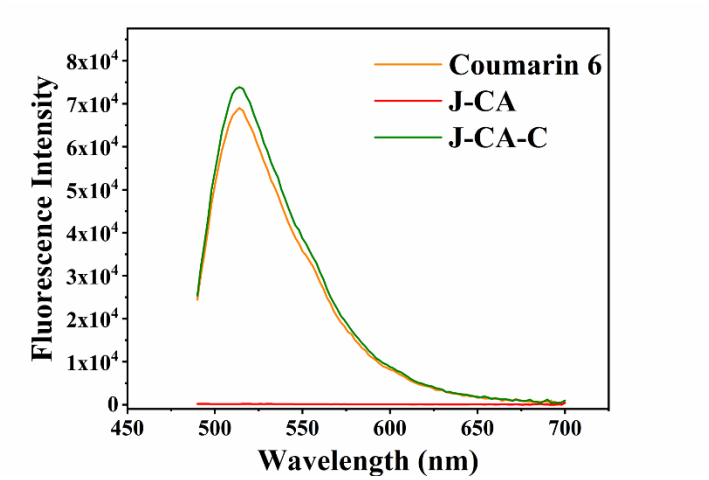

Figure S6. Fluorescence image of J-CA and J-CA-C in aqueous solution.

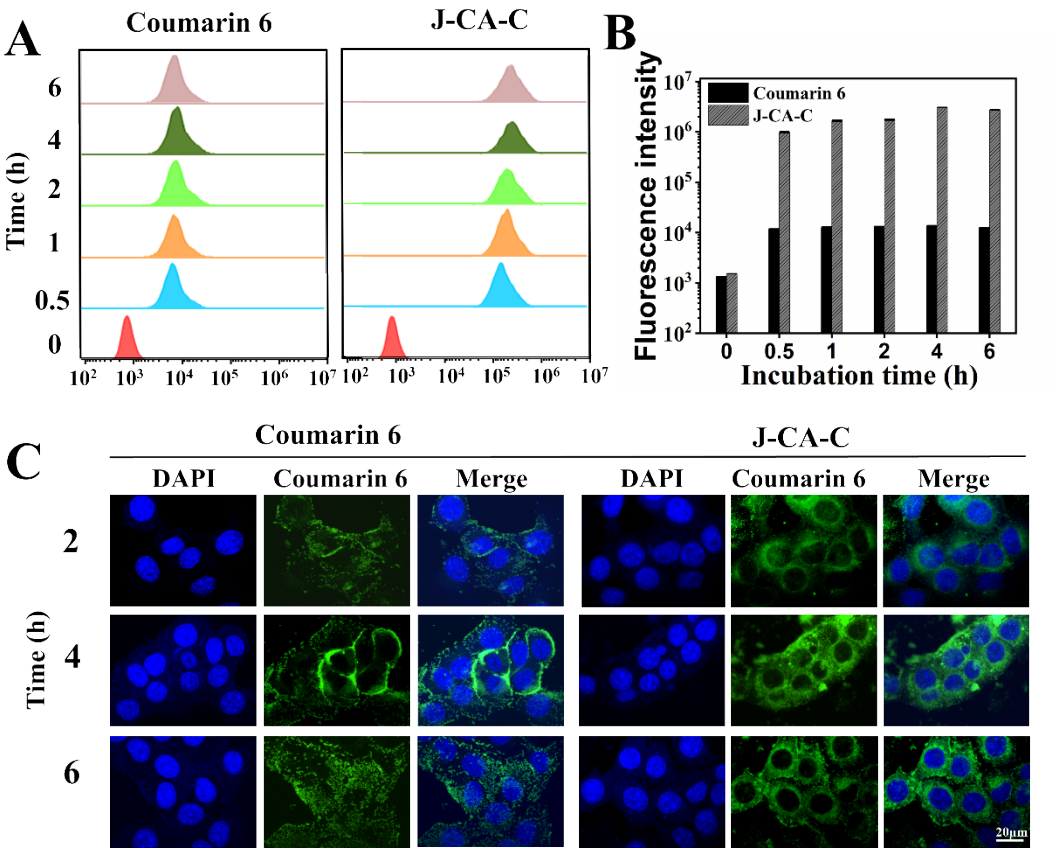

Figure S7. J-CA-C cell uptake behavior characterization. (A). Flow cytometry result at the time range of 0-6 h. (B) Mean fluorescence intensities of the 4T1 cell after incubation with J-CA-C at incubation time of 0-6 h. (C) CLSM images of uptake behavior of J-CA-C inside 4T1 cells at 2 h, 4 h, and 6 h post incubation.

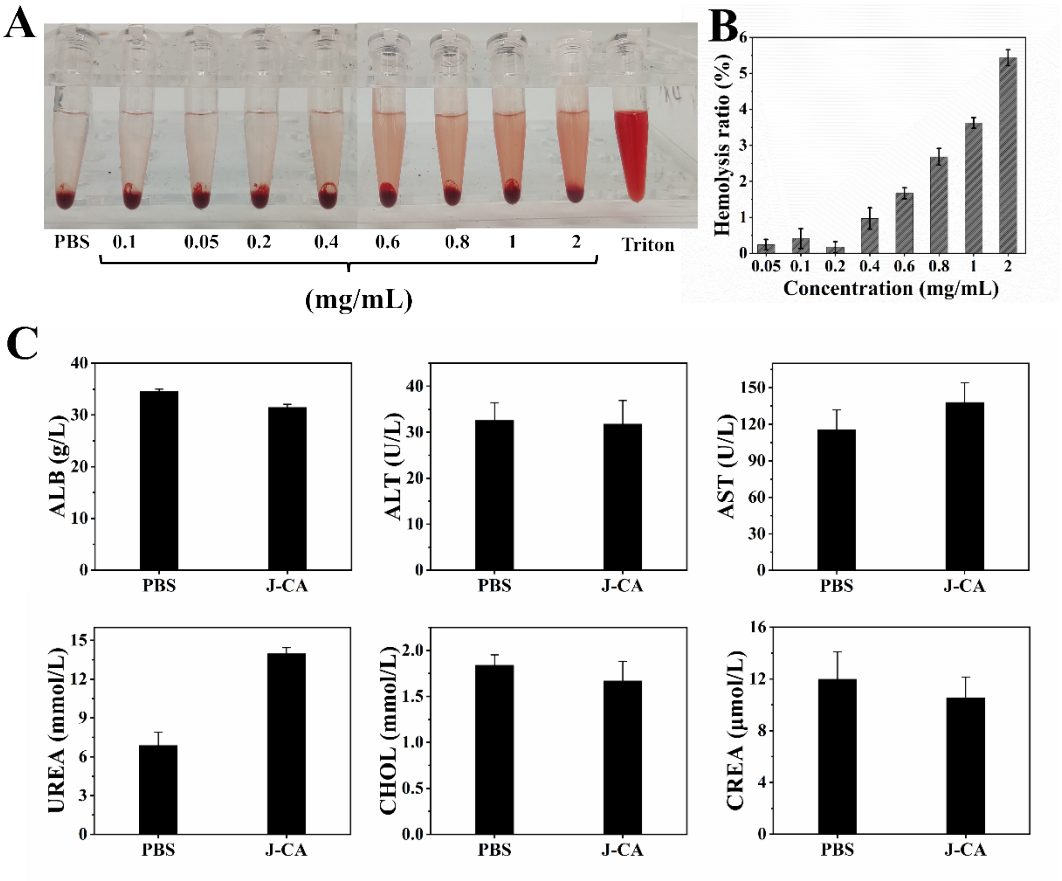

Figure S8. Biocompatibility characterization of J-CA. (A) Digital images of hemolysis behavior of J-CA at concentration of 0.05-2 mg/mL against HUVEC. (B) Statistic result of hemolysis ratio of J-CA at concentration of 0.05-2 mg/mL against HUVEC. (C) Physiology indices values of mice on 7 days post administrating of J-CA in mice intravenously.

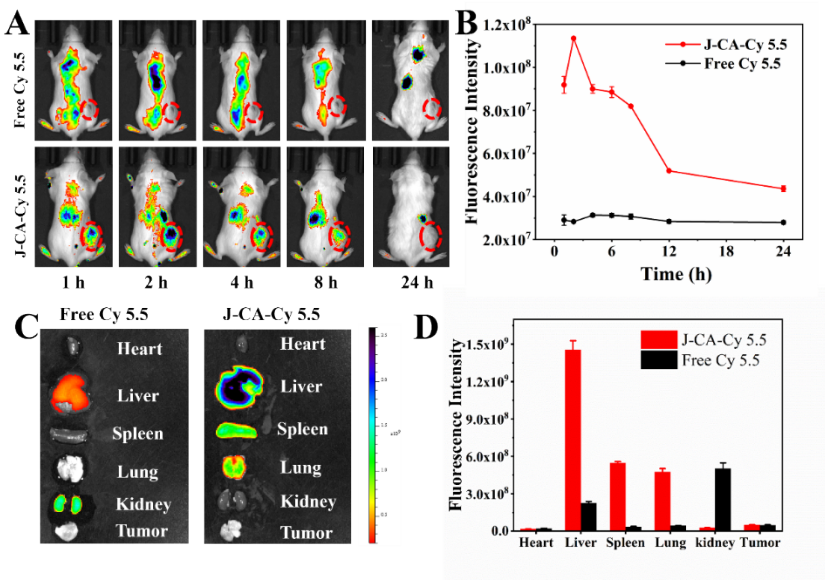

Figure S9. (A) *In vivo* fluorescence imaging and (B) quantification of average fluorescence intensity of tumor of 4T1 mice after vein injection of J-CA-Cy5.5 and free Cy5.5. (C) *Ex vivo* fluorescence images and (D) quantification of the fluorescent signals of 4T1 tumor and major organs of mice at 24 h post-injection.