

Supporting Information

A novel “mosaic-type” nanoparticle for selective drug-release targeting hypoxia cancer cells

Table S1. Effect of Surfactin, Compound 1 (Cy7), GA and Cy7-GA on cell viability in PC-3 cells. The IC₅₀ values in μM are presented in the table.

Compound	IC₅₀ values (μM)
Surfactin	104.97 ± 0.77
Compound 1 (Cy7)	47.38 ± 1.69
GA	0.48 ± 0.035
Cy7-GA	1.12 ± 0.097

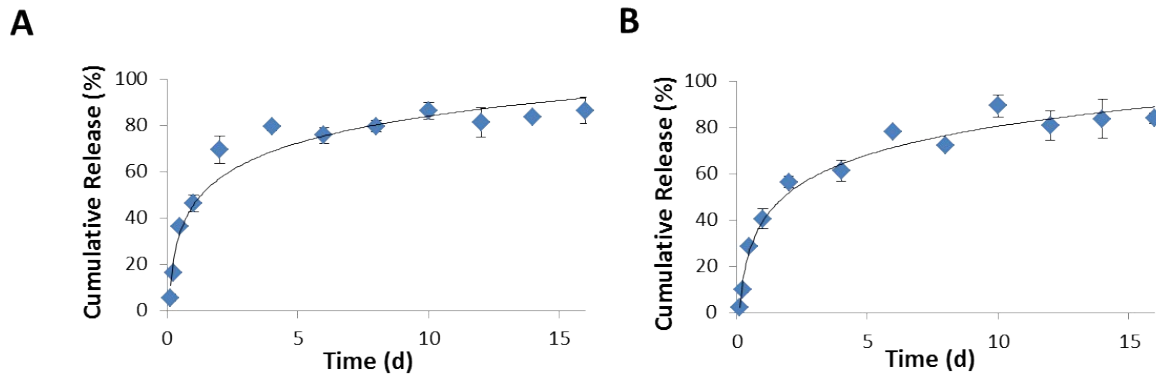


Figure. S1. In vitro release of (A) GA-Cy7/Cy5.5-NP and (B) GA-Cy7/Rho 110-NP in PBS solution. Each point represents mean \pm SEM (n = 3).

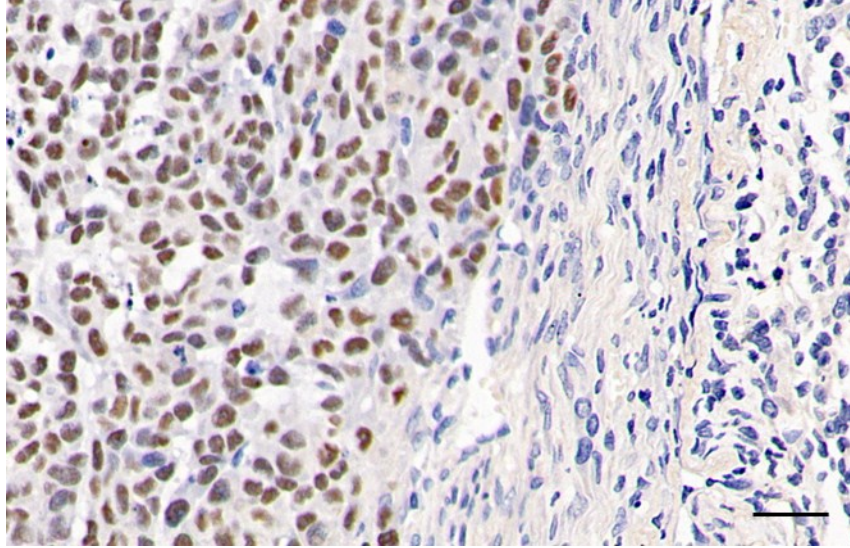


Figure. S2. Representative images obtained from PC-3 tumor-bearing mice showing HIF1 α expression in tumor specimens. Original magnification, $\times 400$; scale bars, 20 μm .

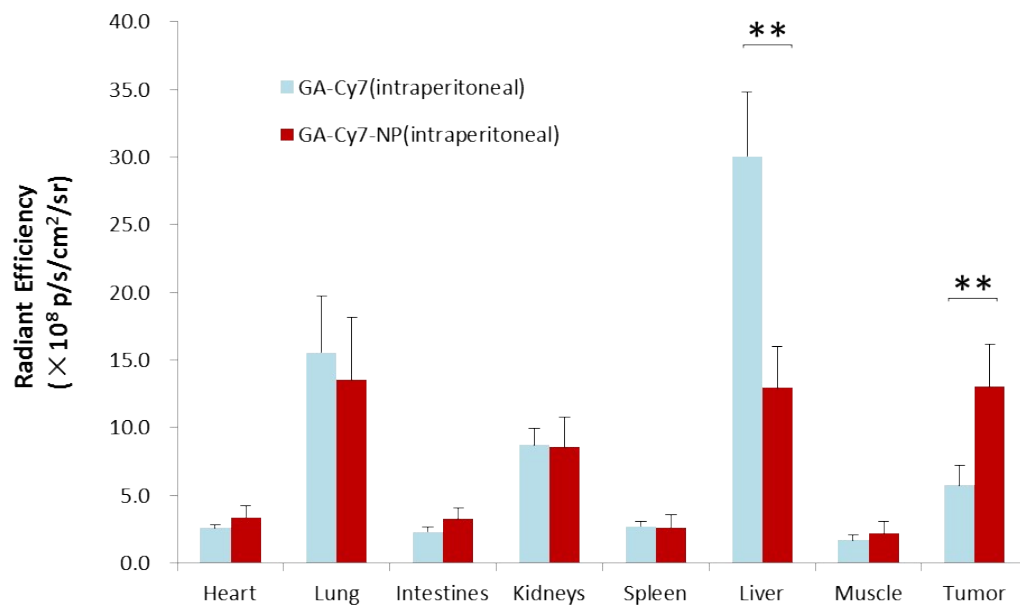


Figure S3. Biodistribution of GA-Cy7 and GA-Cy7-NP at 48 h post-injection averaged from 5 subjects was quantified. ****** $p < 0.01$.

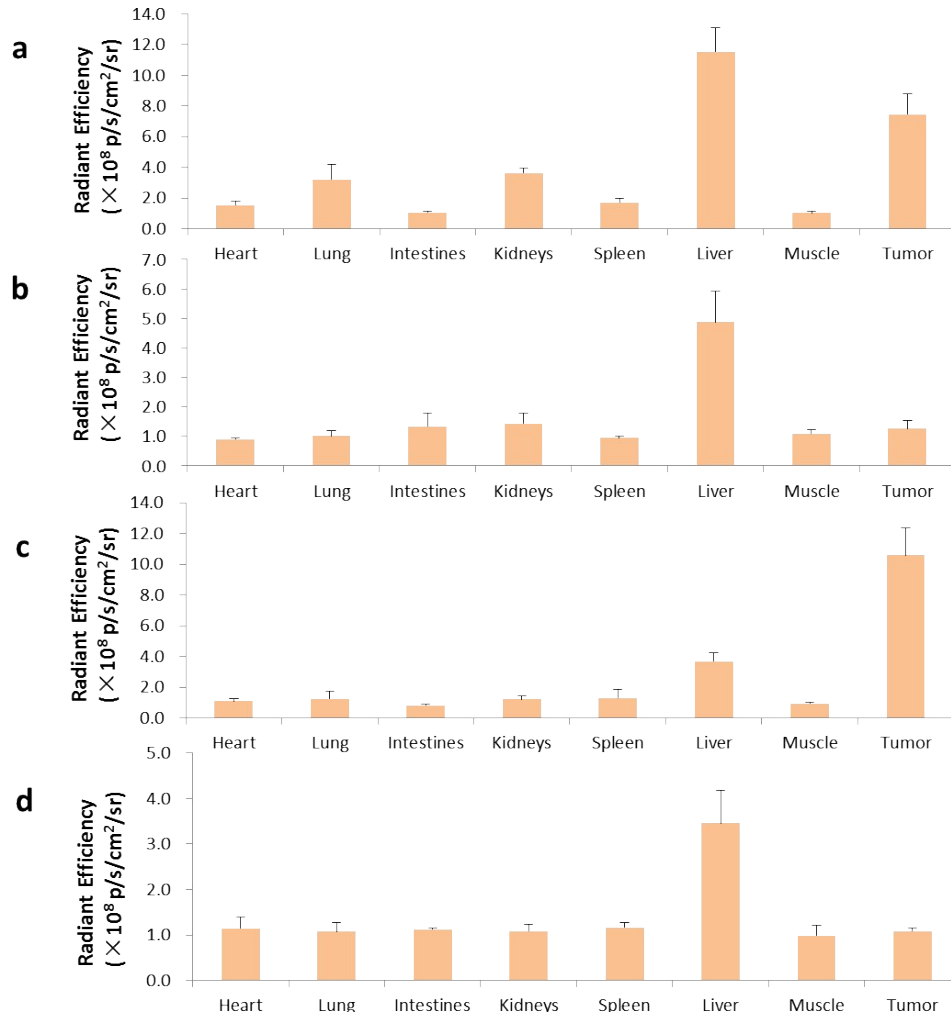


Figure S4. Biodistribution of GA-Cy7/Cy5.5-NP at 48 h post-injection averaged from 5 subjects was quantified. Intraperitoneal group (A) for GA-Cy7 (excitation/emission, 745/820 nm) (B) for Cy5.5 (excitation/emission, 675/720 nm); Intratumorally group (C) for GA-Cy7(excitation/emission, 745/820 nm) (D) for Cy5.5 (excitation/emission, 675/720 nm).

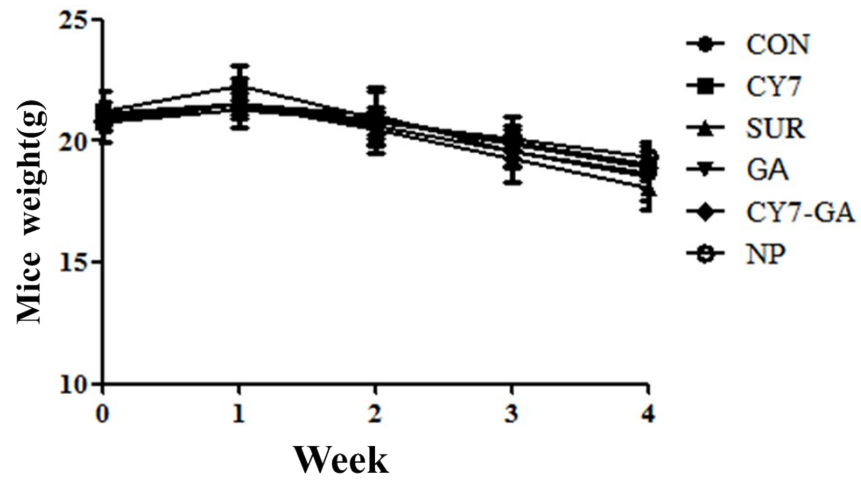


Figure S5. Mice body weights monitored every week after tumor implantation.

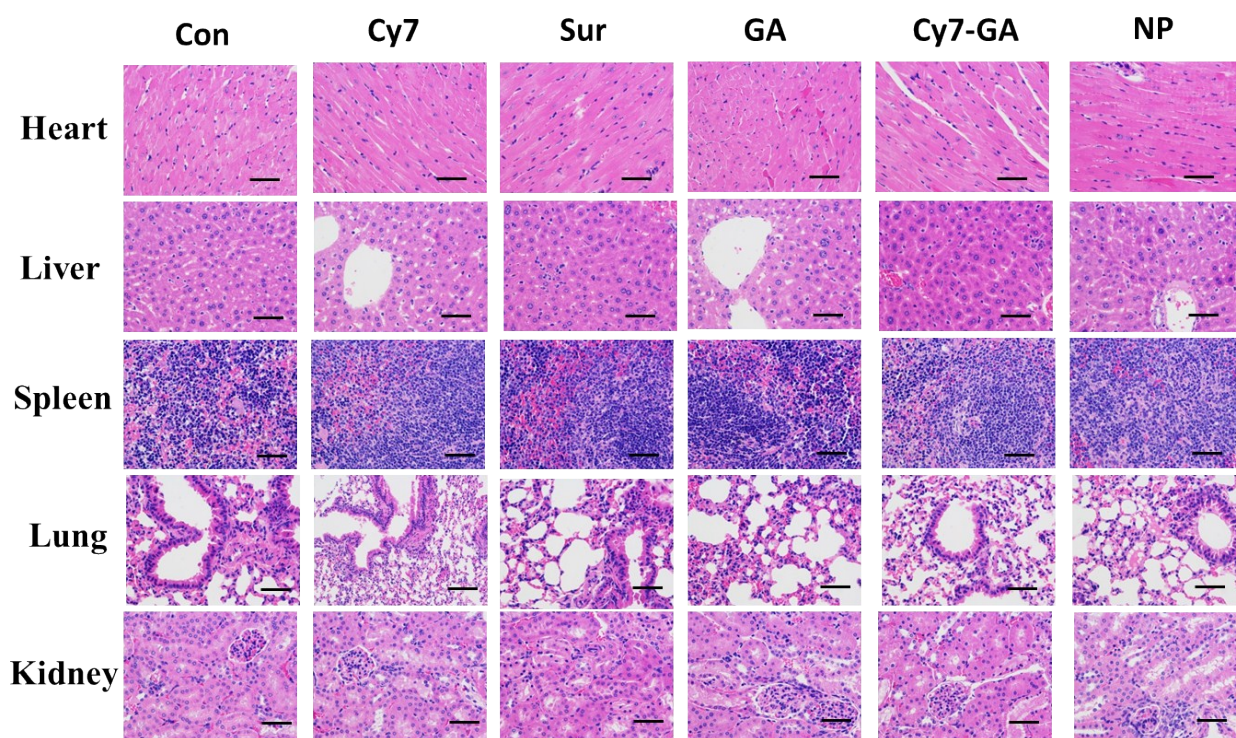


Figure S6. Representative images obtained from treated and control mice showing H&E staining in heart, liver, spleen, lung and kidneys. Original magnification, $\times 400$; scale bars, 20 μm .

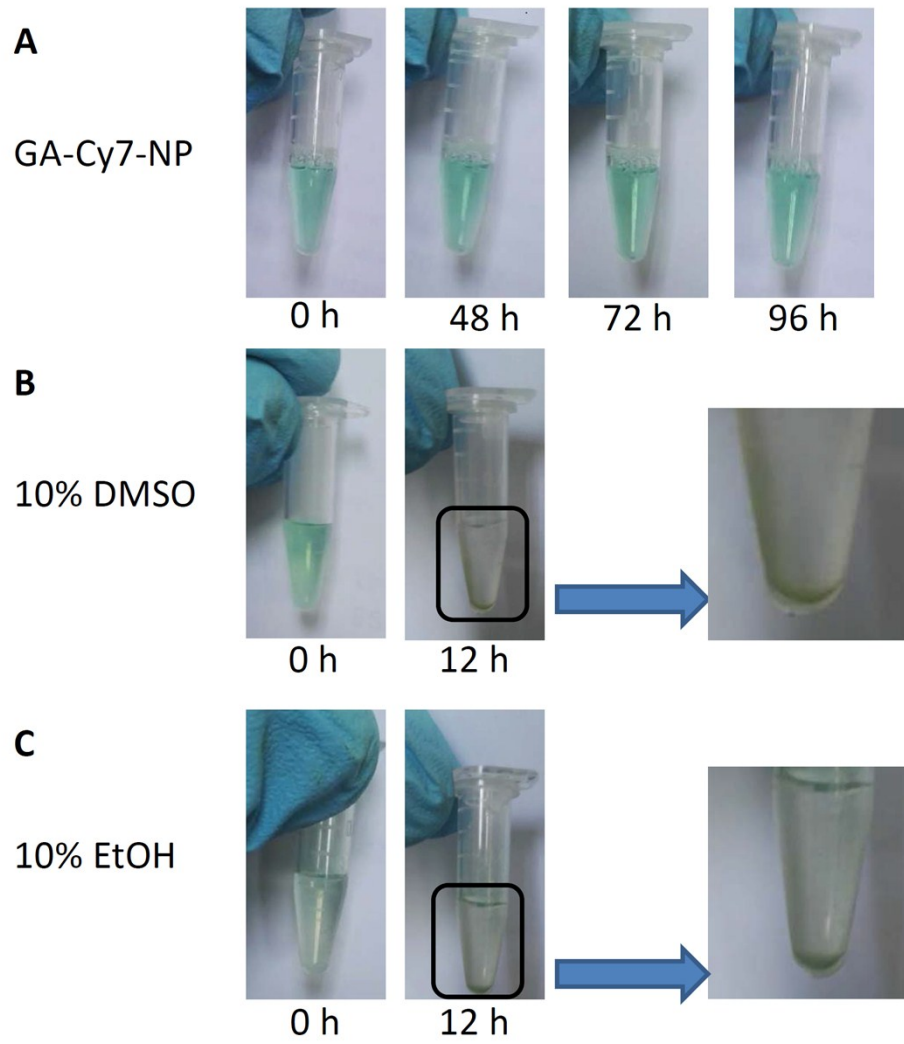


Figure S7. Stability test of GA-Cy7-NP and GA-Cy7 in 10% FBS solution. (A) GA-Cy7-NP in the 1:20 molar ratio (GA-Cy7: surfactin, the concentration of GA-Cy7 was 50 μM). (B-C) free GA-Cy7 (the concentration was 50 μM) with DMSO and ethyl alcohol as hydrotrophy agent.

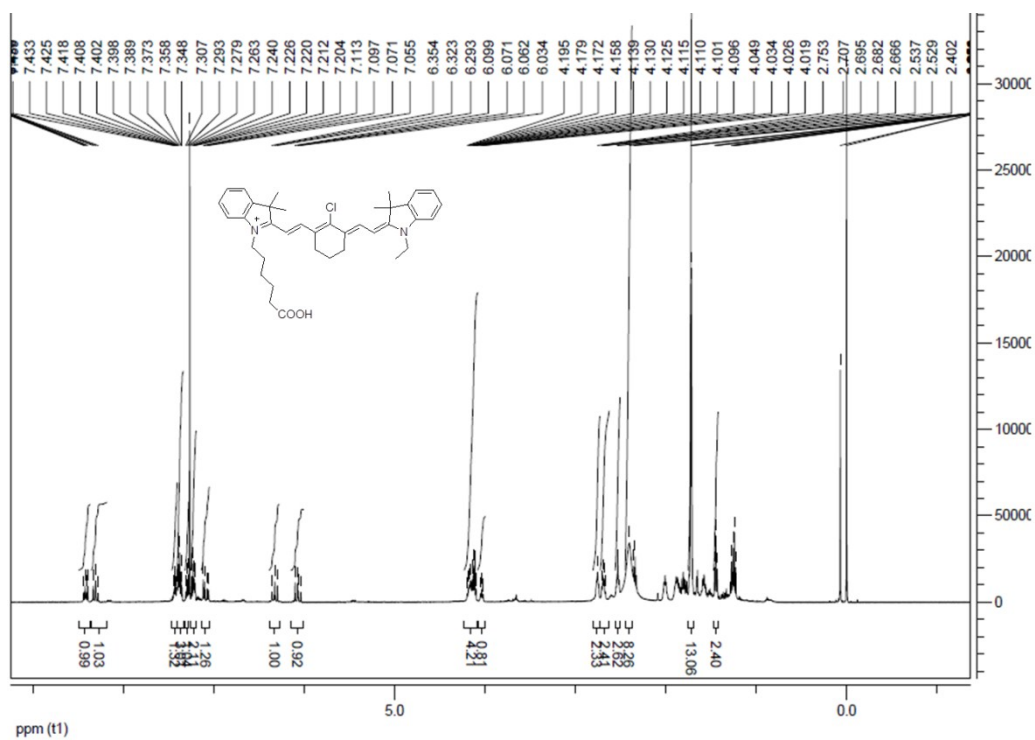


Figure S8. The ^1H NMR spectra of compound **1**.

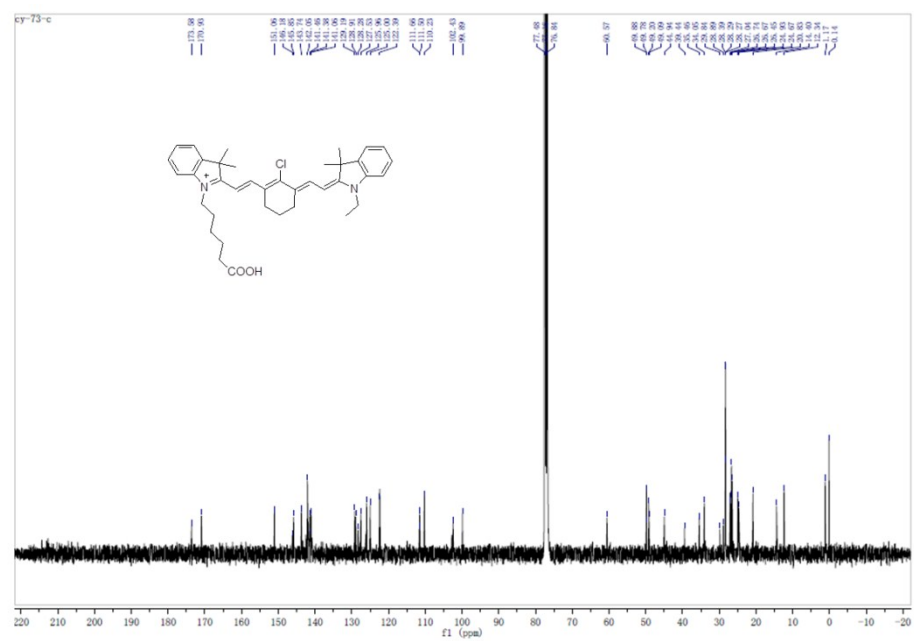


Figure S9. The ^{13}C NMR spectra of compound **1**.

National Center for Organic Mass Spectrometry in Shanghai
Shanghai Institute of Organic Chemistry
Chinese Academic of Sciences
High Resolution MS DATA REPORT



Instrument: Thermo Fisher Scientific LTQ FTICR-MS

Card Serial Number: M171340

Sample Serial Number: CY-73

Operator: HUAQIN Date: 2017/06/08

Operation Mode: DART Positive Ion Mode

Elemental composition search on mass 597.32

m/z= 592.32-602.32

m/z	Theo. Mass	Delta (ppm)	RDB equiv.	Composition
597.3237	597.3242	-0.91	16.5	C ₃₈ H ₄₆ O ₂ N ₂ Cl
	597.3229	1.34	17.0	C ₃₆ H ₄₄ ON ₅ Cl
	597.3224	2.15	21.5	C ₃₉ H ₄₁ O ₂ N ₄
	597.3216	3.58	12.0	C ₃₅ H ₄₈ O ₅ NCl

M171339 #340 RT: 5.09 AV: 1 NL: 6.67E5
T: FTMS + p NSI Full ms [150.00-1500.00]

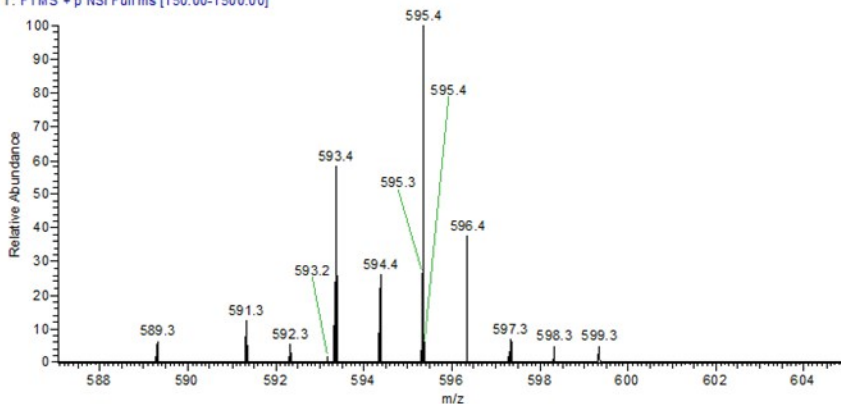
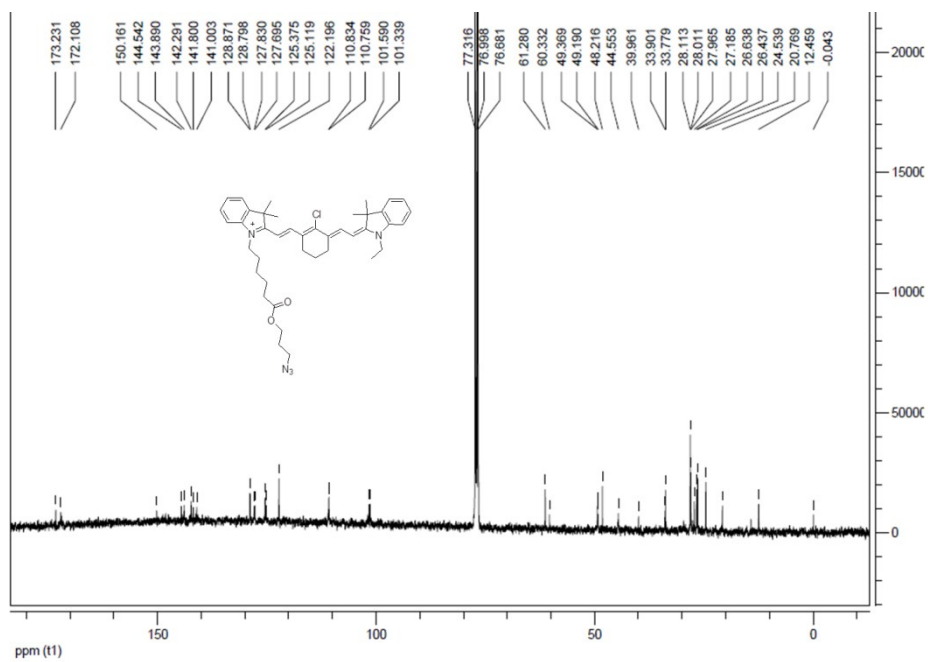
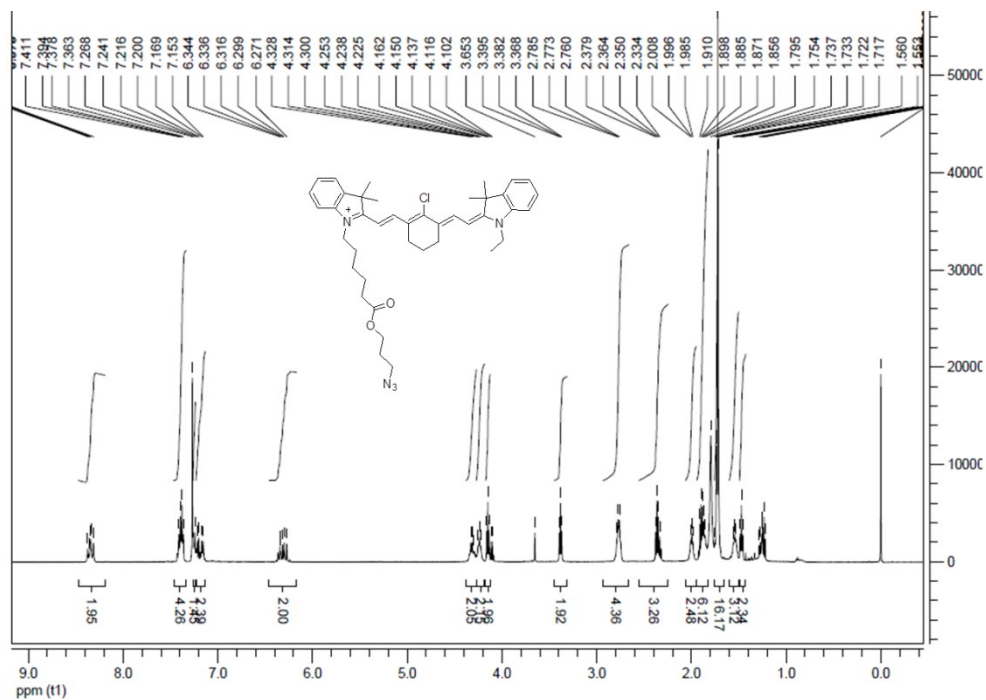


Figure S10. The MS spectra of compound 1.



[National Center for Organic Mass Spectrometry in Shanghai
Shanghai Institute of Organic Chemistry
Chinese Academic of Sciences
High Resolution MS DATA REPORT



Instrument: Thermo Fisher Scientific LTQ FTICR-MS

Card Serial Number: M171344

Sample Serial Number: CY-78

Operator: HUAQIN Date: 2017/06/08

Operation Mode: DART Positive Ion Mode

Elemental composition search on mass 680.37

m/z= 675.37-685.37

m/z	Theo. Mass	Delta (ppm)	RDB equiv.	Composition
680.3710	680.3721	-1.58	23.0	C ₄₄ H ₄₈ O ₃ N ₄
	680.3699	1.65	14.0	C ₃₈ H ₅₃ O ₅ N ₄ Cl
	680.3726	-2.29	18.5	C ₄₁ H ₅₁ O ₂ N ₅ Cl
	680.3739	-4.27	18.0	C ₄₃ H ₅₃ O ₃ N ₂ Cl

M171343 #11 RT: 0.15 AV: 1 NL: 3.04E6
T: FTMS + p NSI Full ms [150.00-1500.00]

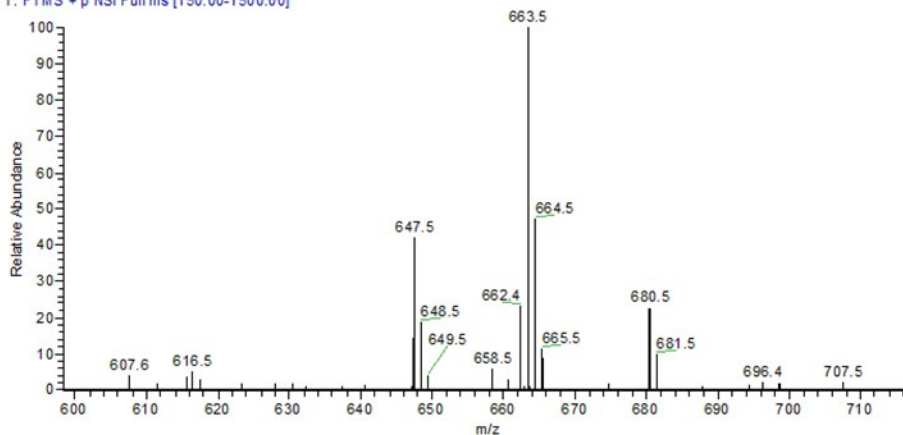


Figure S13. The MS spectra of compound 2.

National Center for Organic Mass Spectrometry in Shanghai
Shanghai Institute of Organic Chemistry
Chinese Academic of Sciences
High Resolution MS DATA REPORT



Instrument: Thermo Fisher Scientific LTQ FTICR-MS

Card Serial Number: M171338

Sample Serial Number: CY-71

Operator: HUAQIN Date: 2017/06/08

Operation Mode: DART Positive Ion Mode

Elemental composition search on mass 709.37

m/z= 704.37-714.37

m/z	Theo. Mass	Delta (ppm)	RDB equiv.	Composition
709.3722	709.3735	-1.81	18.5	C ₄₄ H ₅₃ O ₈

M171337 #69 RT: 1.03 AV: 1 NL: 1.36E8
T: FTMS + p NSI Full ms [150.00-1500.00]

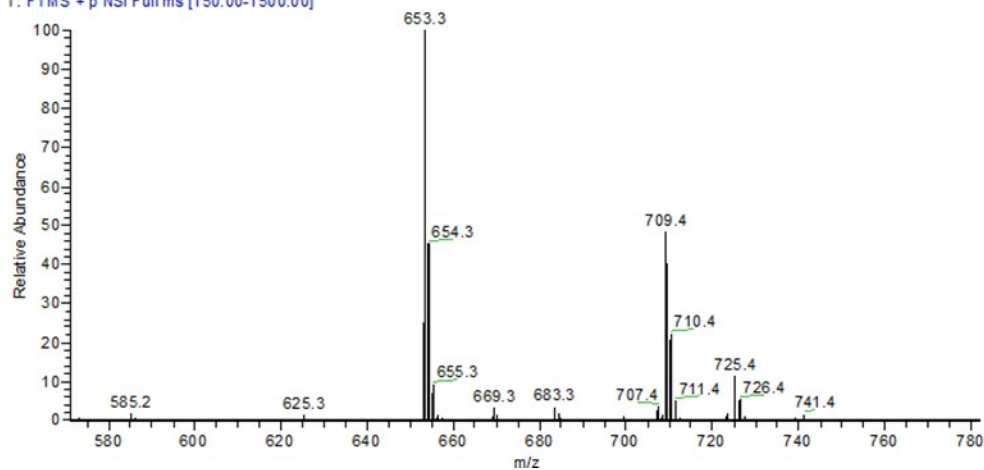


Figure S16. The MS spectra of compound 3.

National Center for Organic Mass Spectrometry in Shanghai
Shanghai Institute of Organic Chemistry
Chinese Academic of Sciences
High Resolution MS DATA REPORT



Instrument: Thermo Fisher Scientific LTQ FTICR-MS

Card Serial Number: M171490

Sample Serial Number: CY-76

Operator: HUAQIN Date: 2017/06/19

Operation Mode: MALDI_DHB Positive Ion Mode

Elemental composition search on mass 1388.74

m/z= 1383.74-1393.74

m/z	Theo. Mass	Delta (ppm)	RDB equiv.	Composition
1388.7395	1388.7388	0.47	36.5	C ₈₅ H ₁₀₃ O ₁₀ N ₅ Cl
	1388.7428	-2.43	40.5	C ₉₀ H ₁₀₃ O ₈ N ₃ Cl

M171489 #208 RT: 14.37 AV: 1 NL: 2.07E4
T: FTMS + p MALDI Full ms [150.00-1500.00]

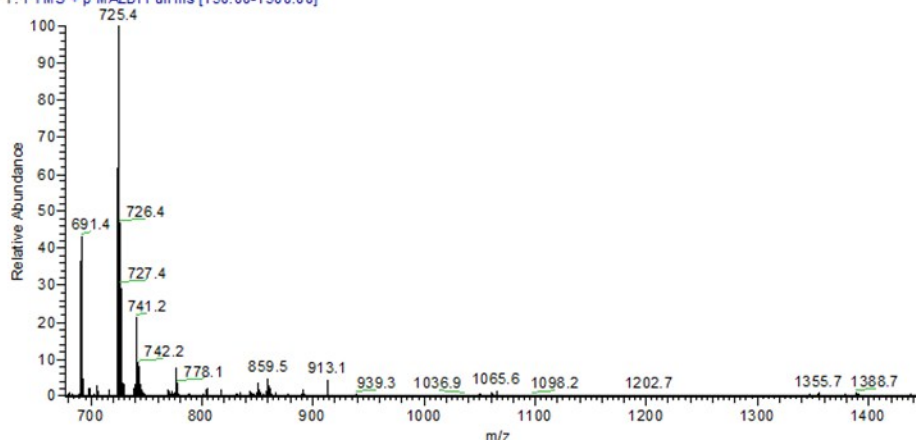


Figure S19. The MS spectra of compound GA-Cy7.

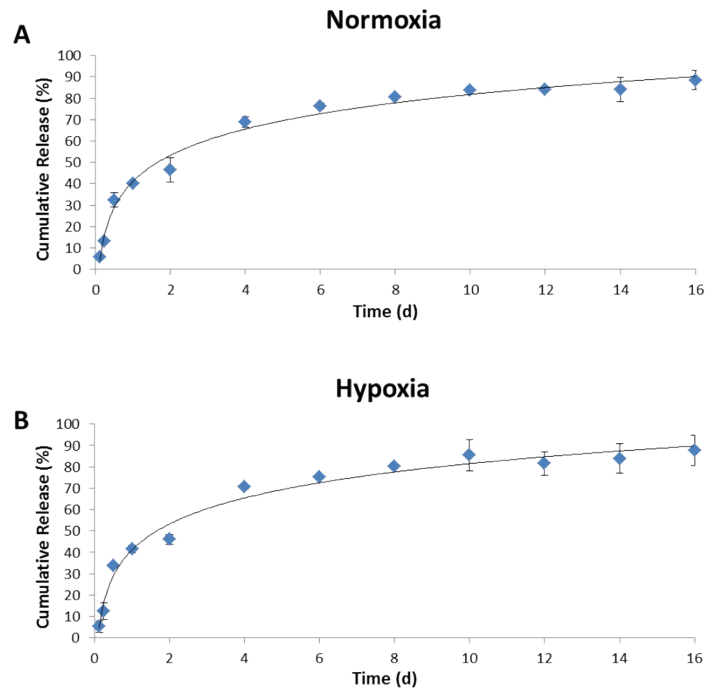


Figure S20. In vitro release of GA-Cy7-NP in water under normoxic environment (B) and under hypoxic environment (C). Each point represents mean \pm SEM ($n = 3$).