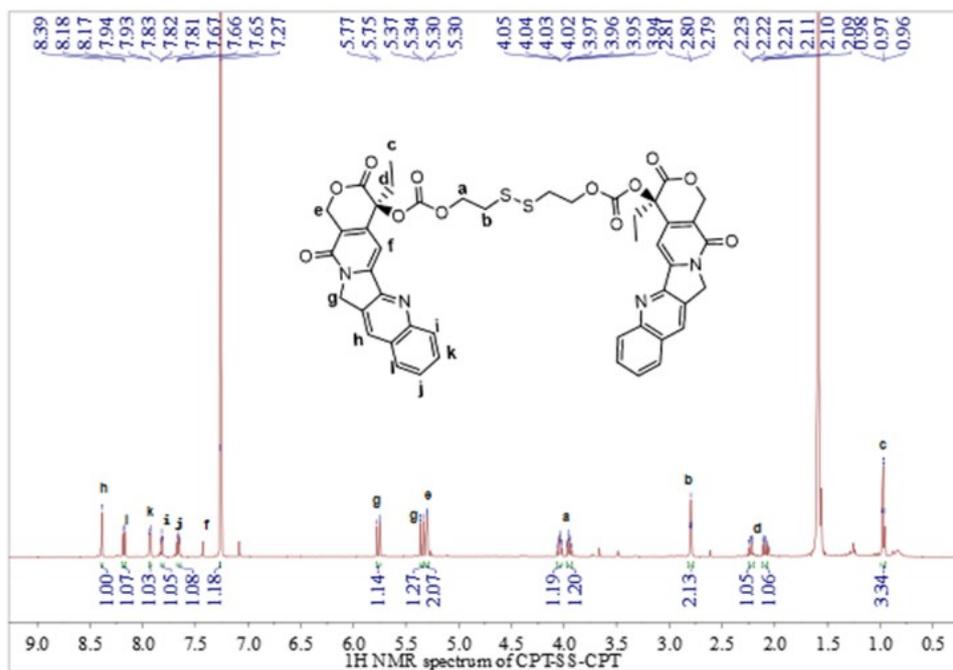
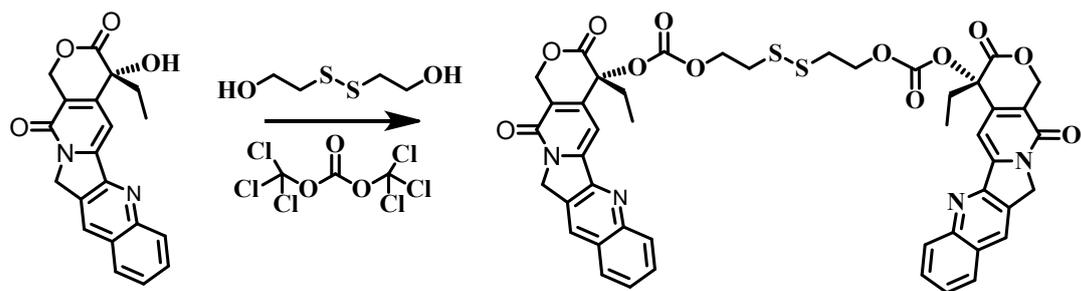


Supplementary Information

Dimeric camptothecin loaded RGD-targeting cationic polypeptide-based micelles with high drug loading and redox-responsive drug release

Zhaopei Guo, Xingzhi Zhou, Mengze Xu, Huayu Tian, Xuesi Chen, Meiwan Chen*



20170217 CPT-SS-CPT #292 RT: 11.27 AV: 1 NL: 8.20E5
T: FTMS + c ESI Full ms [100.00-1200.00]

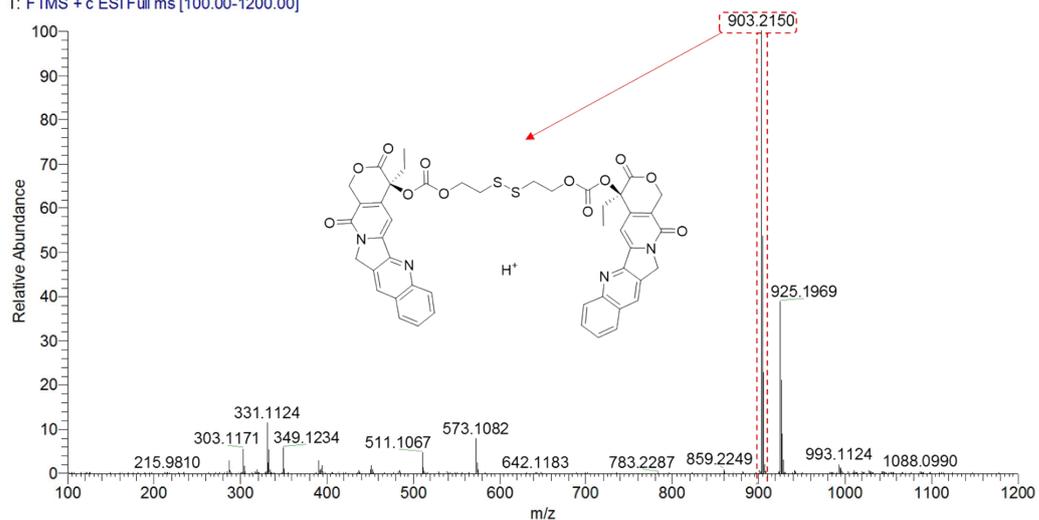


Figure S1 Preparation of DCPT and its characterization.

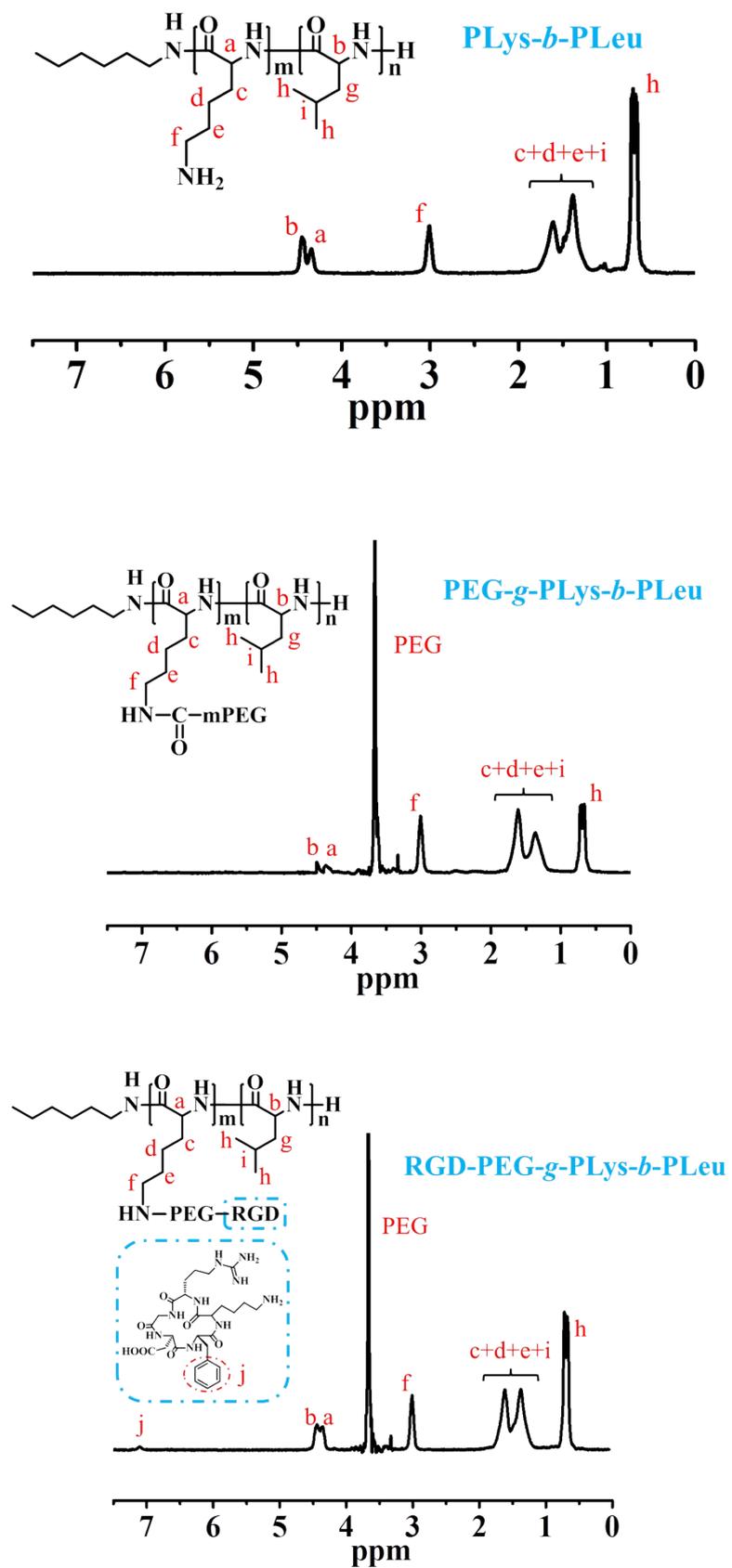


Figure S2 ¹H NMR spectra of PLys-*b*-PLeu, PEG-*g*-PLys-*b*-PLeu, and RGD-PEG-*g*-PLys-*b*-PLeu in *d*-TFA.

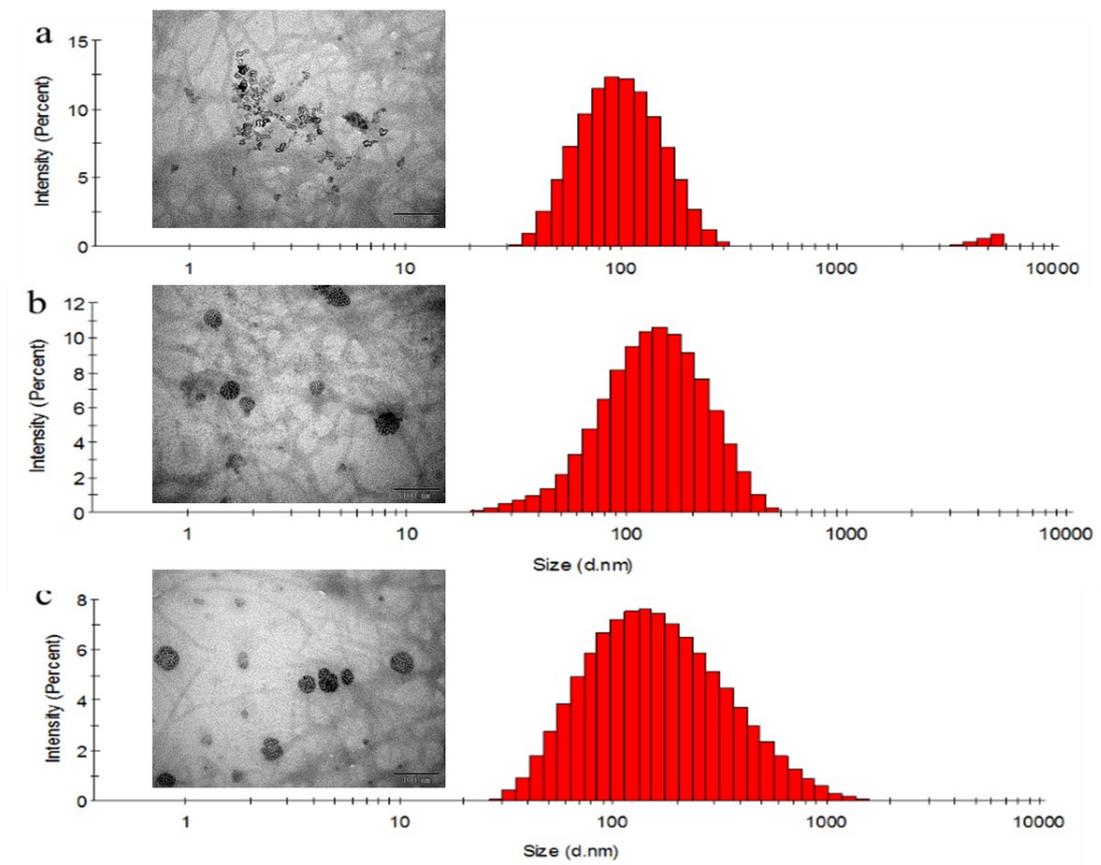


Figure S3 Size distribution of DPP (a), DPPP (b) and DRPPP (c), scale bar is 100 nm.

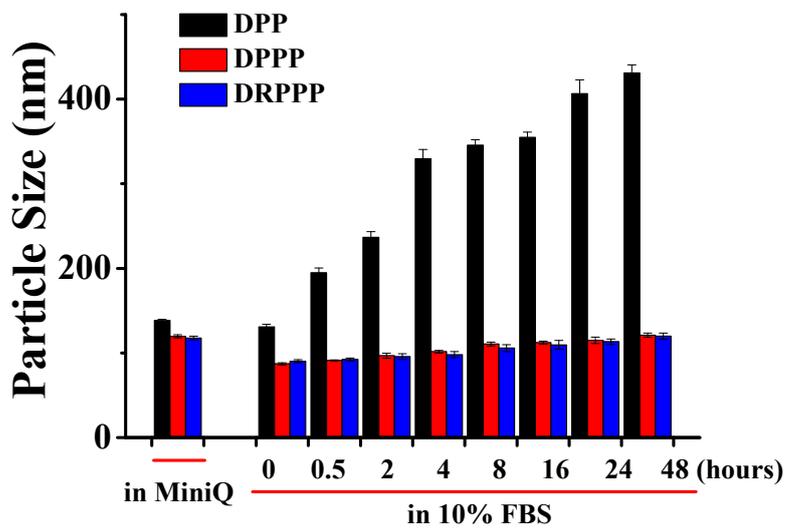


Figure S4 Stability of DCPT loaded micelles in 10% FBS within 48 h.

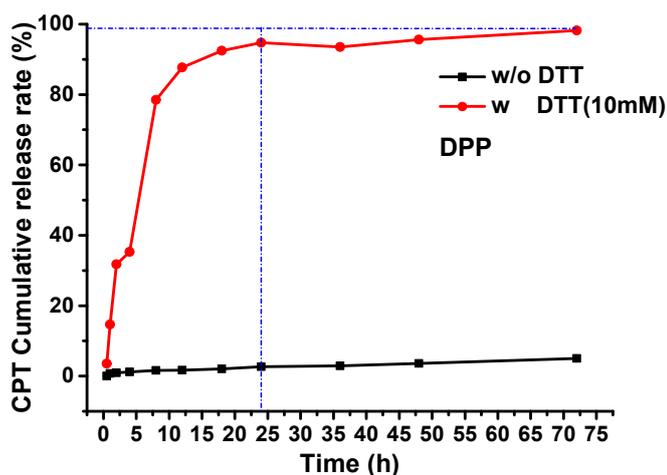


Figure S5 In vitro release profile of CPT from DPP in PBS with or without DTT.

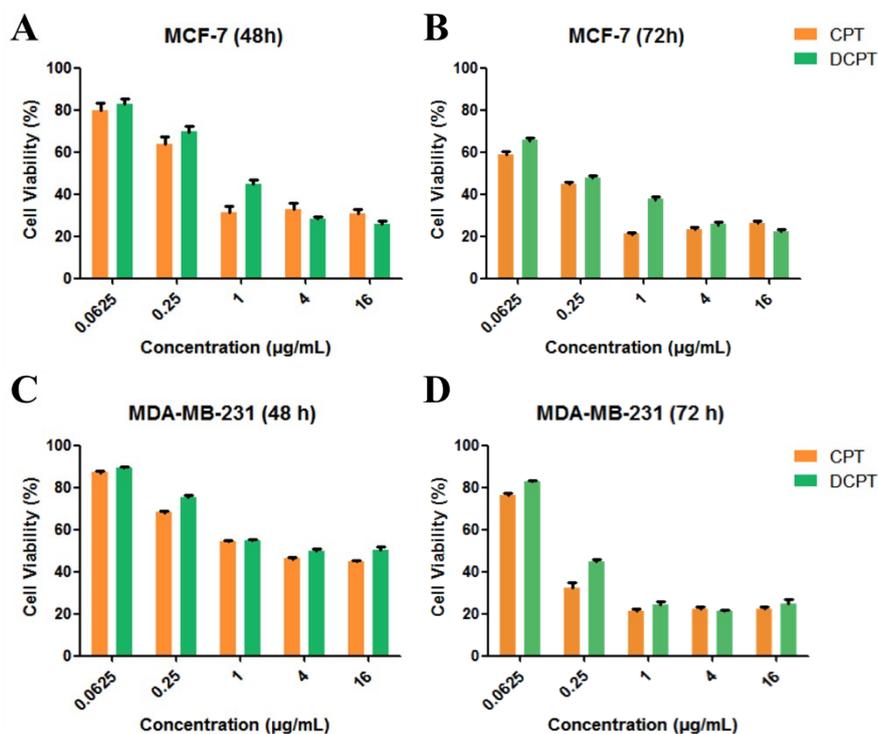


Figure S6 Cytotoxicity of MCF-7 (A and B) and MDA-MB-231 (C and D) cells treated with CPT and DCPT for 48 h and 72 h.

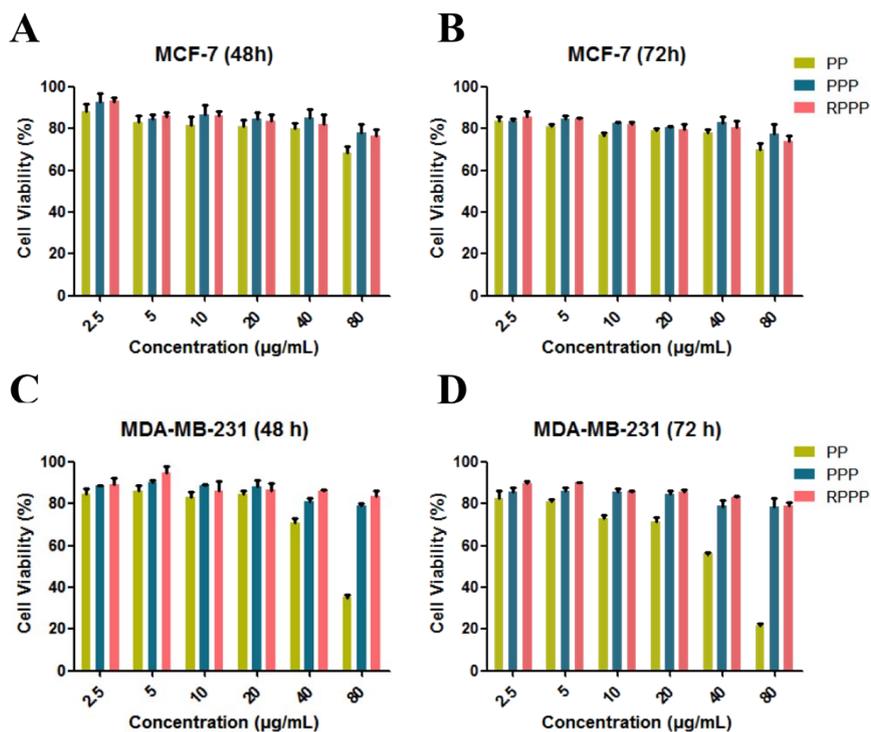


Figure S7 Cytotoxicity of MCF-7 (A and B) and MDA-MB-231 (C and D) cells treated with PP, PPP and RPPP for 48 h and 72 h.

Table S1 Degree of polymerization of PLys-*b*-PLeu calculated by ¹H NMR.

Polymers	Feed mol ratio of Lys (Z)-	Resultant mol ratio of
	NCA/Leu-NCA	Lys/Leu by ¹ H NMR
PLys ₃₀ - <i>b</i> -PLeu ₂₀	30/20	30/19
PLys ₃₀ - <i>b</i> -PLeu ₄₀	30/40	30/41
PLys ₃₀ - <i>b</i> -PLeu ₆₀	30/60	30/62

Table S2 EE%, DL%, particle size and zeta potential of DCPT loaded micelles.

PLys-<i>b</i>-PLeu	PLys-<i>b</i>-PLeu /DCPT	EE (%)	DL (%)	Zeta potential (mV)	Particle sizes (nm)	PDI
30-20	-	-	-	24.6	208.6	0.279
	2/1	46.8	15.6	51.1	81.7	0.255
	1/1	32.0	16.0	55.5	135.2	0.221
30-20	1/1.5	9.1	5.5	49.8	186.5	0.256
	1/2	5.5	3.7	47.8	199.6	0.256
	1/2.5	2.7	2.0	44.1	210.2	0.216
30-40	-	-	-	36.0	117.5	0.299
	2/1	50.4	16.8	48.7	117.3	0.252
	1/1	37.5	18.8	51.1	154.3	0.392
30-40	1/1.5	33.0	18.0	50.3	117.4	0.335
	1/2	77.6	39.9	41.7	129.9	0.251
	1/2.5	26.1	17.4	48.8	149.1	0.321
30-60	-	-	-	37.1	128.4	0.286
	2/1	45.8	15.3	52.3	133.1	0.285
	1/1	23.6	11.8	50.7	127.3	0.171
30-60	1/1.5	25.2	13.1	51.6	91.5	0.182
	1/2	38.5	25.7	48.0	153.1	0.151
	1/2.5	2.2	1.6	49.1	101.1	0.199

Table S3. EE%, DL%, particle size and zeta potential of the CPT loaded micelles.

PLys- <i>b</i> -PLeu	PLys- <i>b</i> -PLeu /CPT	EE (%)	DL (%)	Zeta potential (mV)	Particle size (nm)	PDI
30-20	10/1	6.0	0.55	32.1	682.4	0.610
	5/1	4.9	0.32	35.3	272.6	0.347
30-40	10/1	5.2	0.5	30.3	588.9	0.691
	5/1	10.4	0.9	33.2	346.1	0.600
30-60	10/1	5.0	0.49	35.1	219.5	0.398
	5/1	7.8	0.6	36.7	199.6	0.467

Table S4. IC₅₀ values in MDA-MB-231 cells

Treatment samples	IC ₅₀ (µg/mL)(48 h)	IC ₅₀ (µg/mL)(72 h)
Free CPT	4.02±1.14	0.43±0.19
DPP	1.95±0.82	0.46±0.23
DPPP	2.75±1.05	0.47±0.12
DRPPP	1.60±0.62	0.41±0.11

Table S5. IC₅₀ values in MCF-7 cells

Treatment samples	IC ₅₀ (µg/mL)(48 h)	IC ₅₀ (µg/mL)(72 h)
Free CPT	0.38±0.22	0.35±0.16
DPP	0.40±0.29	0.75±0.37
DPPP	0.64±0.36	0.95±0.53
DRPPP	0.65±0.43	0.82±0.52