

Supplementary Information Available

Folate modified dual pH/reduction-responsive mixed micelles assembled by FA-PEG-PDEAEMA and PEG-SS-PCL for doxorubicin delivery

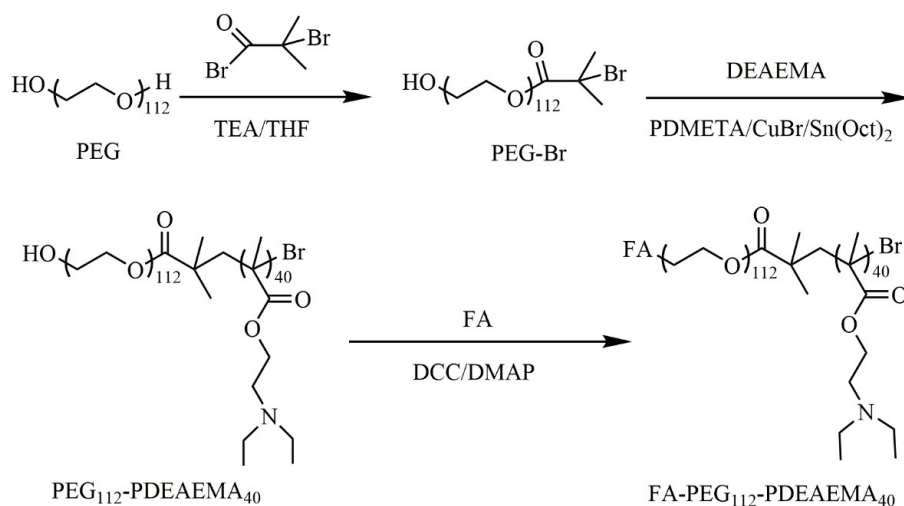
Chufen Yang^{1,2}, Delin Wang¹, Wenyao Liu¹, Zexiong Yang¹, Teng He¹, Fang Chen¹, Wenjing Lin^{1,2}

¹*School of Chemical Engineering and Light Industry, Guangdong University of Technology, Guangzhou*

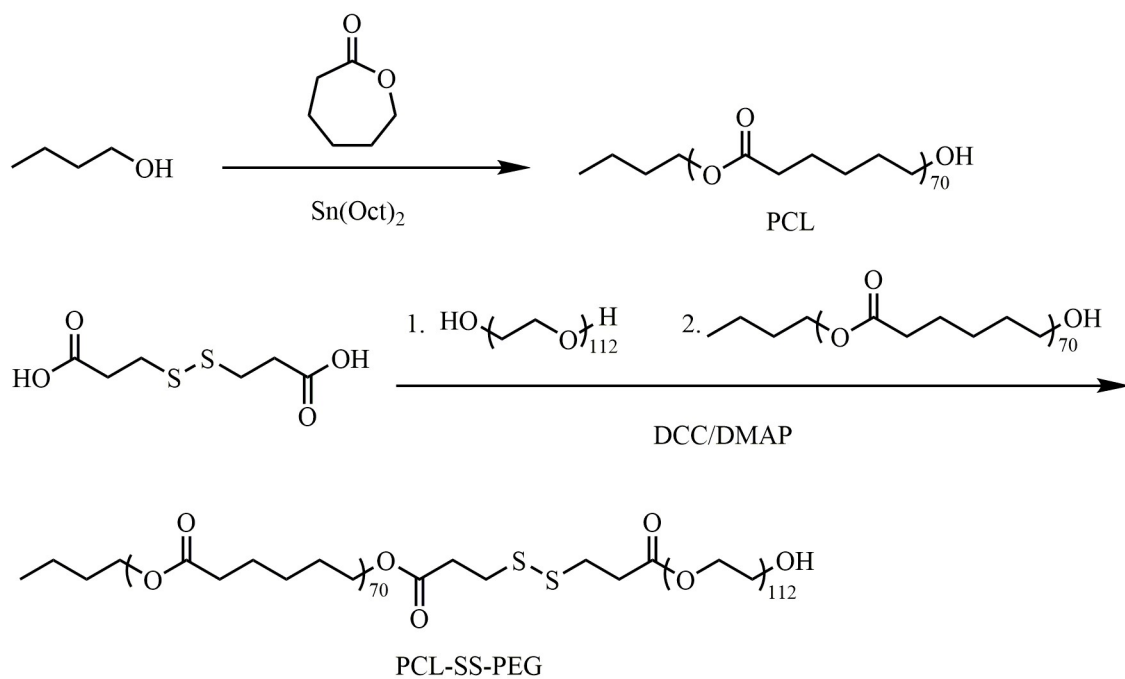
510006, PR China

²*Jieyang Branch of Chemistry and Chemical Engineering Guangdong Laboratory (Rongjiang Laboratory),*

Jieyang 515200, China



Scheme S1 Synthetic route of PEG₁₁₂-PDEAEMA₄₀ and FA-PEG₁₁₂-PDEAEMA₄₀.



Scheme S2 Synthetic route of PEG₁₁₂-SS-PCL₇₀.

Table S1 The interaction parameter a_{ij} between each beads in neutral environment.

a_{ij}	DEA	D1	D2	D3	FA1	FA2	FA3	FA4	MAA	PCL	PEG	S1	S2	W
DEA	25													
D1	27.6	25												
D2	26.7	27.2	25											
D3	25.6	25.4	25.7	25										
FA1	67.0	49.8	25.7	24.8	25									
FA2	42.8	32.2	27.3	35.0	30.3	25								
FA3	44.8	33.1	27.8	35.9	29.6	25	25							
FA4	56.5	40.8	26.3	32.8	26.1	26.6	26.3	25						
MAA	30.4	26.1	25.3	25.2	42.1	28.5	29.2	35.3	25					
PCL	25.9	25.1	26.3	25.1	40.2	27.6	28.1	33.3	25.5	25				
PEG	30.6	28.9	27.2	26.8	31.1	25	25.1	27.1	25.9	27.6	25			
S1	25.7	25.2	28.7	26.2	36.8	26.3	26.7	30.9	27.2	25.7	30.9	25		
S2	25.7	25.2	28.7	26.2	36.8	26.3	26.7	30.9	27.2	25.7	30.9	25	25	
W	68.3	42.9	26.9	23.7	23.8	31.6	32.7	24.3	34.2	73.2	26.1	74.1	74.1	25

Table S2 The interaction parameter a_{ij} between each beads in acidity and high reducibility.

a_{ij}	DEAH	D1	D2	D3H	FA1H	FA2	FA3	FA4	MAA	PCL	PEG	S1H	S2H	W
DEAH	25													
D1	31.7	25												
D2	24.8	27.2	25											
D3H	24.3	21.4	23.2	25										
FA1H	23.7	89.8	25.7	24.8	25									
FA2	42.8	32.2	27.3	35	36.5	25								
FA3	44.8	33.1	27.8	45.9	46.6	25	25							
FA4	25.5	40.8	26.3	22.8	20.7	26.6	26.3	25						
MAA	31.4	26.1	25.2	41.2	52.1	28.5	29.2	35.3	25					
PCL	96.8	25.1	26.3	92.5	47.2	27.6	28.1	33.3	25.5	25				
PEG	22.8	28.9	27.2	21.2	23.8	25	25.1	27.1	25.9	27.6	25			
S1H	22.4	35.4	26.4	20.3	24.6	76.4	43.3	22.5	30.8	54.7	22.3	25		
S2H	22.4	35.4	26.4	20.3	24.6	76.4	43.3	22.5	30.8	54.7	22.3	25	25	
W	10.8	42.9	26.9	8.7	10.6	31.6	32.7	24.3	34.2	73.2	26.1	10.2	10.2	25

Table S3 GPC and ¹H NMR results of polymeric products.

Sample	$M_{n,Theory}^a$	$M_{n,GPC}^b$	$M_{n,NMR}^c$	PDI ^b
PEG ₁₁₂ -Br	5093	4736	4892	1.20
PEG ₁₁₂ -PDEAEMA ₄₀	12069	12746	12227	1.40
FA-PEG ₁₁₂ -PDEAEMA ₄₀	12492	13264	12786	1.52
PEG ₁₁₂ -SS-COOH	5138	4597	4688	1.21
PCL ₇₀	8054	7953	7989	1.44
PCL ₇₀ -SS-PEG ₁₁₂	13174	12809	12180	1.27

^a Calculation from the feed ratio of monomers to initiator; ^b Measured by GPC. ^c Calculation by ¹H NMR spectra.

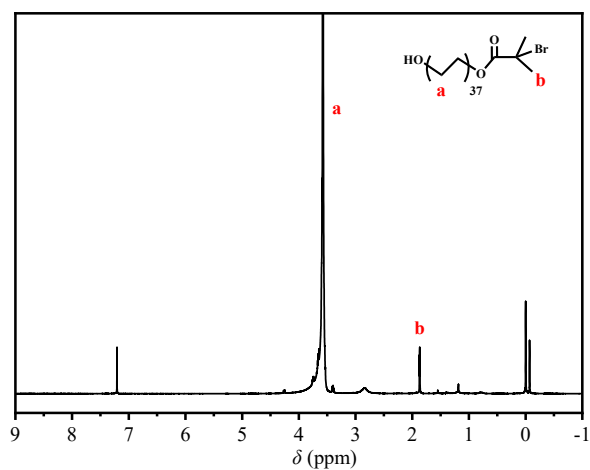


Fig. S1. ^1H NMR spectrum of the macroinitiator PEG₃₇-Br.

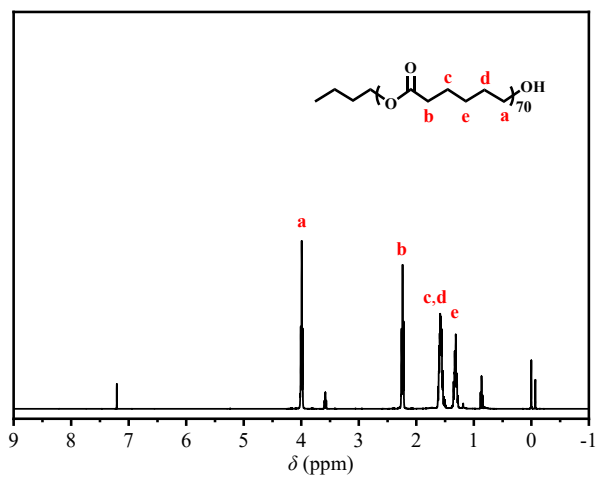


Fig. S2. ^1H NMR spectrum of polymer PCL-OH.

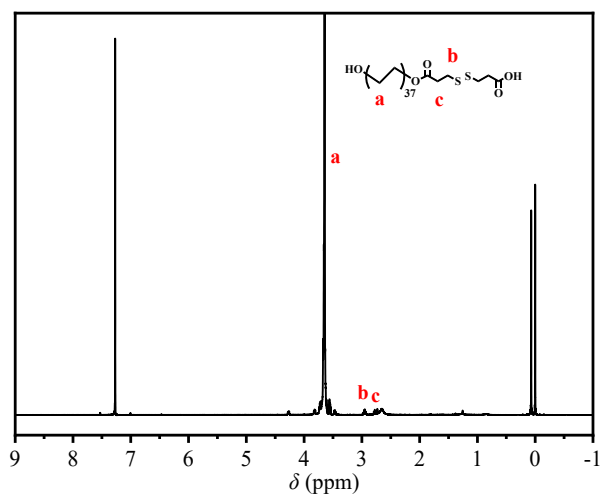


Fig. S3. ^1H NMR spectrum of polymer PEG-SS-COOH.

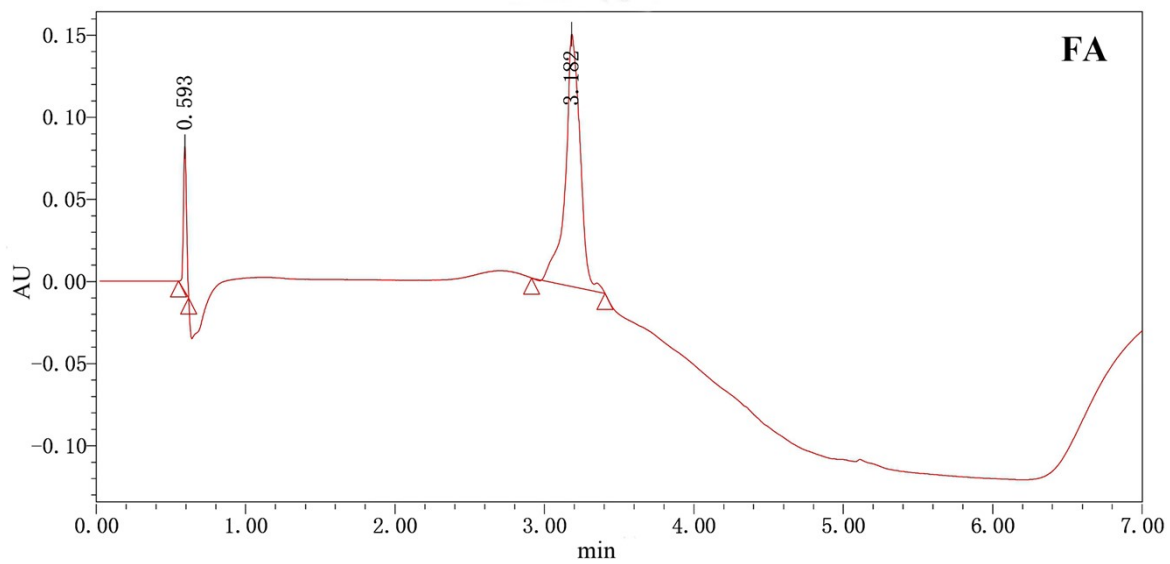


Fig. S4. UPLC of FA.

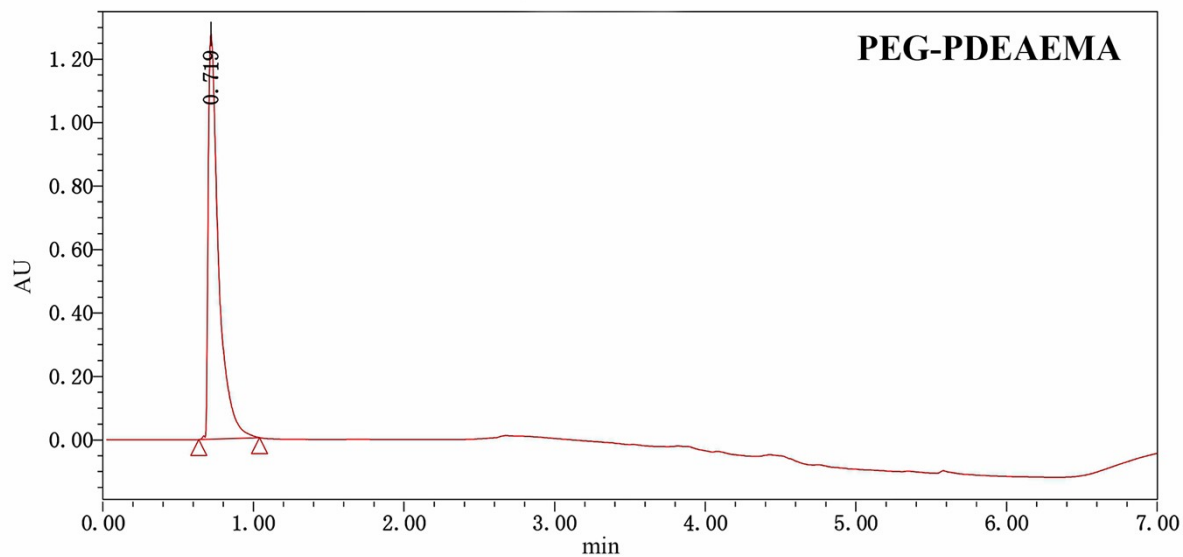


Fig. S5. UPLC of PEG₁₁₂-PDEAEMA₄₀.

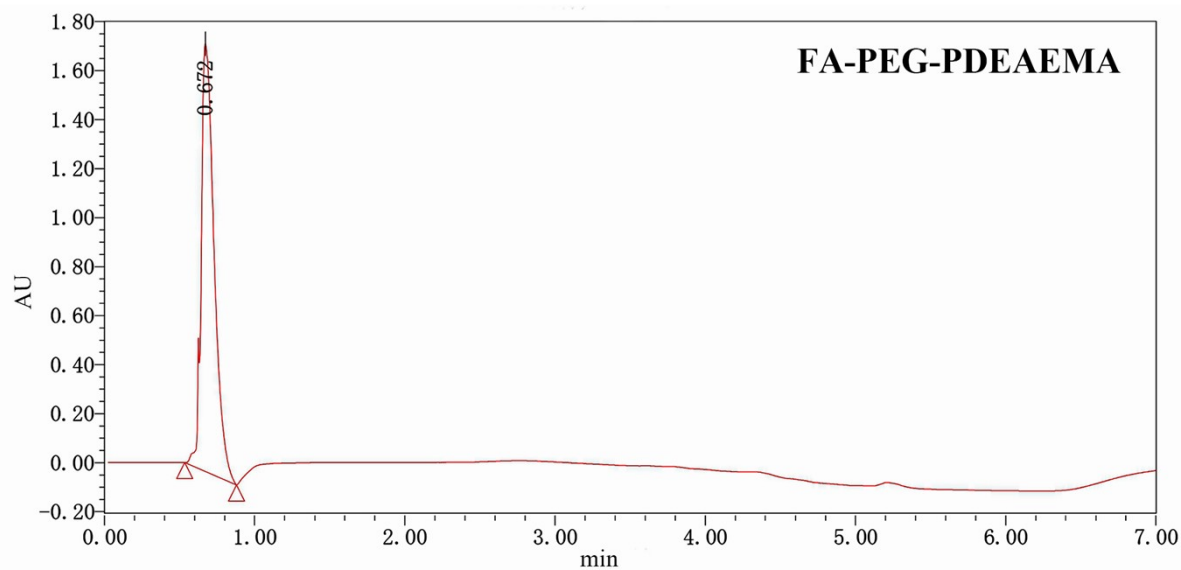


Fig. S6. UPLC of FA-PEG₁₁₂-PDEAEMA₄₀.

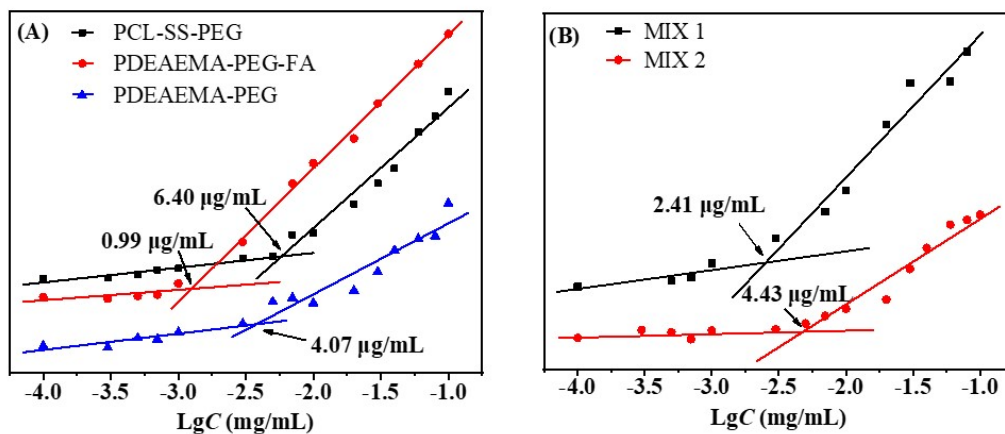


Fig. S7. Different ratios of pyrene in neutral aqueous solution for (A) PDEAEMA₄₀-PEG₁₁₂, PDEAEMA₄₀-PEG₁₁₂-FA, PEG₁₁₂-SS-PCL₇₀ and (B) mixed polymers MIX1 and MIX2 at various concentrations.

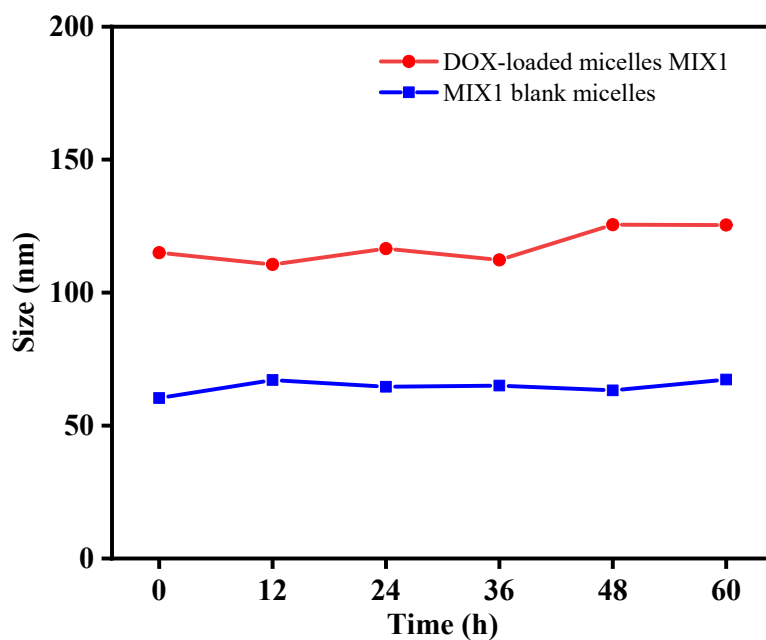


Fig. S8. serum stability of DOX-loaded micelles and blank micelles.