Supporting Information

Synthesis of SN38 Prodrug with Amphiphilic Phosphorylcholine Polymers and Prodrug Micelle Properties

Fan Chen[1], Yuanyuan Cai[1], Lei Huang[1], Yuanwei Chen[*1], Xianglin Luo [1,2 *]

[1] *College of Polymer Science and Engineering, Sichuan University, Chengdu 610065; P. R. China;*

[2] *State Key Lab of Polymer Materials Engineering, Sichuan University, Chengdu 610065; P.R. China;*

Corresponding authors:
Xianglin Luo (Email: luoxl_scu@126.com)

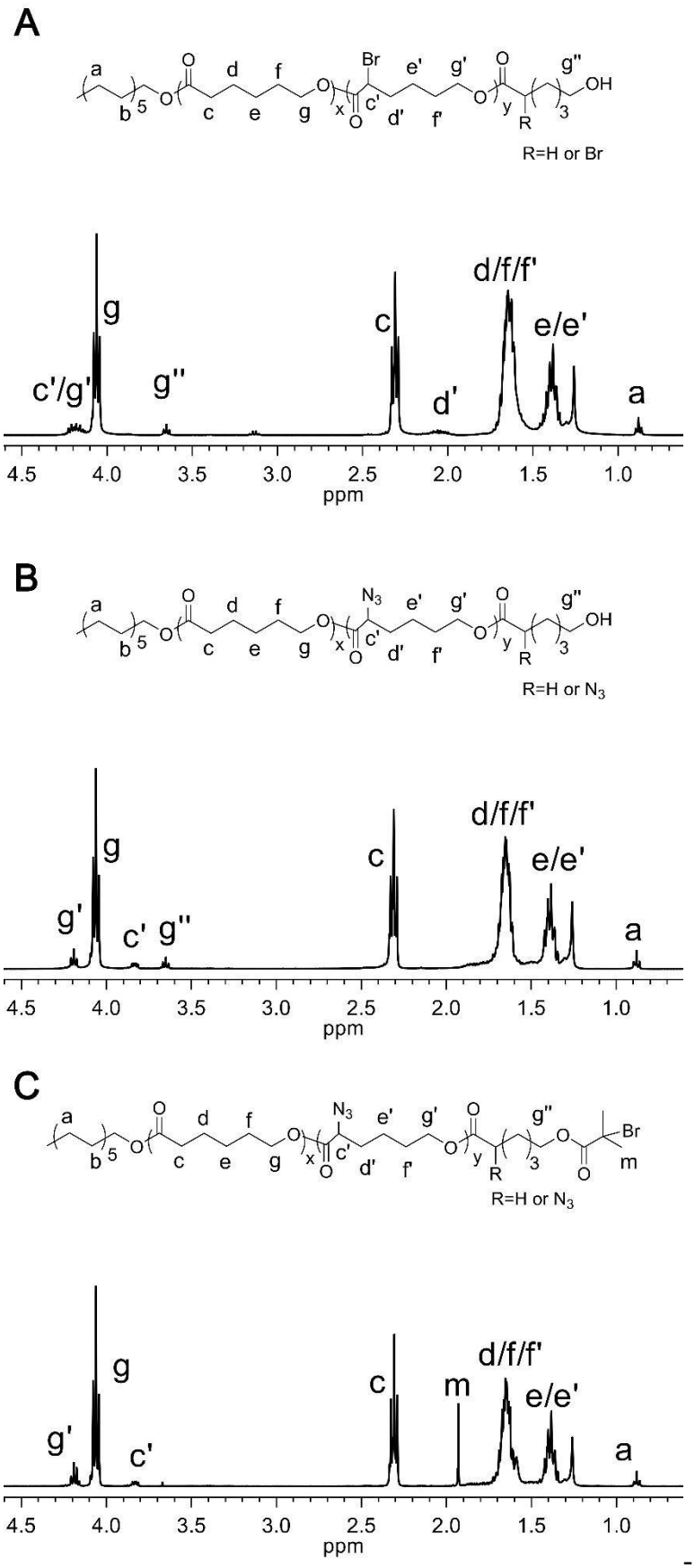

Figure S1 ^{1}H NMR of P(CL-co-BCL)-OH(A), P(CL-co-ACL)-OH(B),

P(CL-co-ACL)-Br(C) in $CDCl_3$.

The total DP of polycaprolactone was determined by ^1H NMR in Figure S1(A) from the integral ratio of peak g'' at 3.65 ppm (methylene protons neighbouring OH in end CL) to peak c at 2.3 ppm (methylene protons neighbouring carbanyl group in CL). The calculated DP of PCL in the copolymers was respectively 29 and 48. The peak g at 4.2 ppm was attributed to the methenyl proton of α-BrCL moieties. Thus, α-BrCL molar fractions were determined by the integral ratio of peak g at 4.2 ppm to peak c at 2.3 ppm, around 10% of sum units. The calculation formula was as follows.

$$n=\frac{\frac{1}{2}\times Ig-\frac{(Ic'g'g-Ic)}{3}}{\frac{1}{2}\times Ig} \qquad (1)$$

$$\omega\%=\frac{\frac{(Ic'g'g-Ic)}{3}}{\frac{1}{2}Ic-(Ic'g'g-Ic)/3} \qquad (2)$$

Where the n represents degree of polymerization of the sum of α-BrCL and ε-caprolactone; Ic represents integral area of peak c; Ic'g'g represents sum of the integral areas of peak c'/g' and g; ω represent percentage α-BrCL.

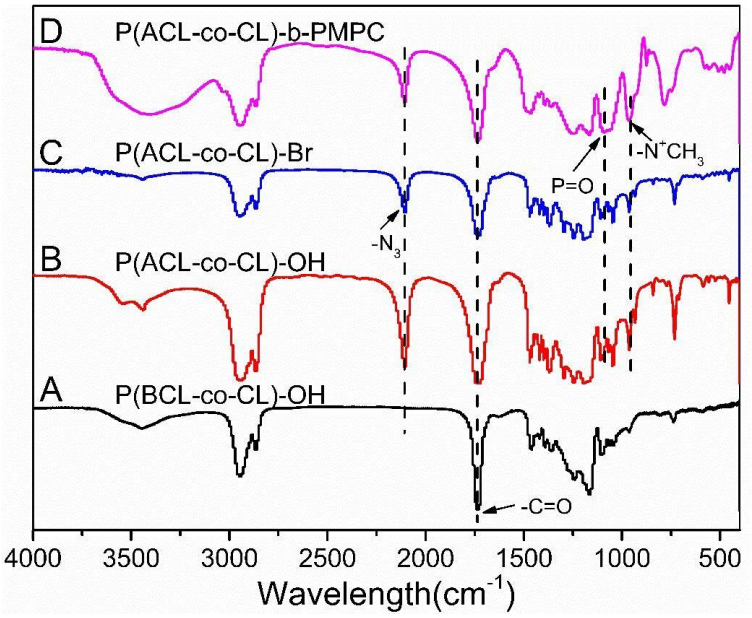

Figure S2 FT-IR spectrum of P(BCL-co-CL)-OH (A), P(ACL-co-CL)-OH (B), P(ACL-co-CL)-Br (C), P(ACL-co-CL)-b-PMPC (D).

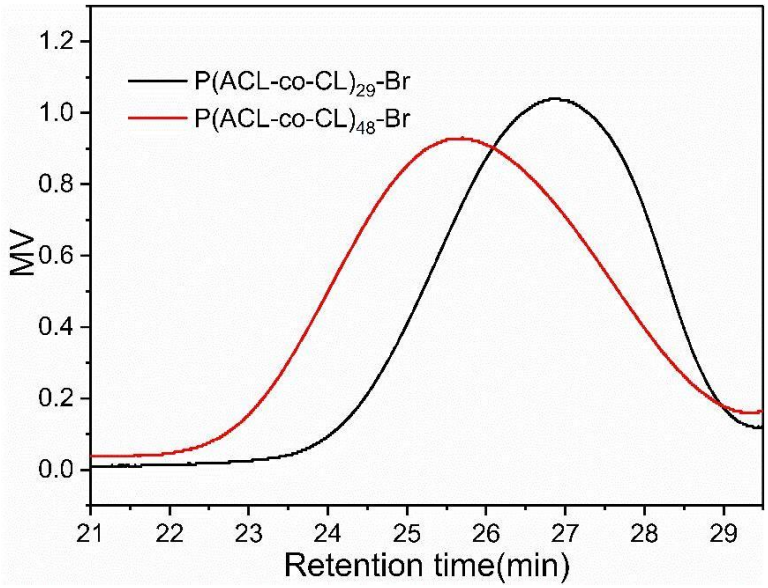

Figure S3 GPC curves of different polymers

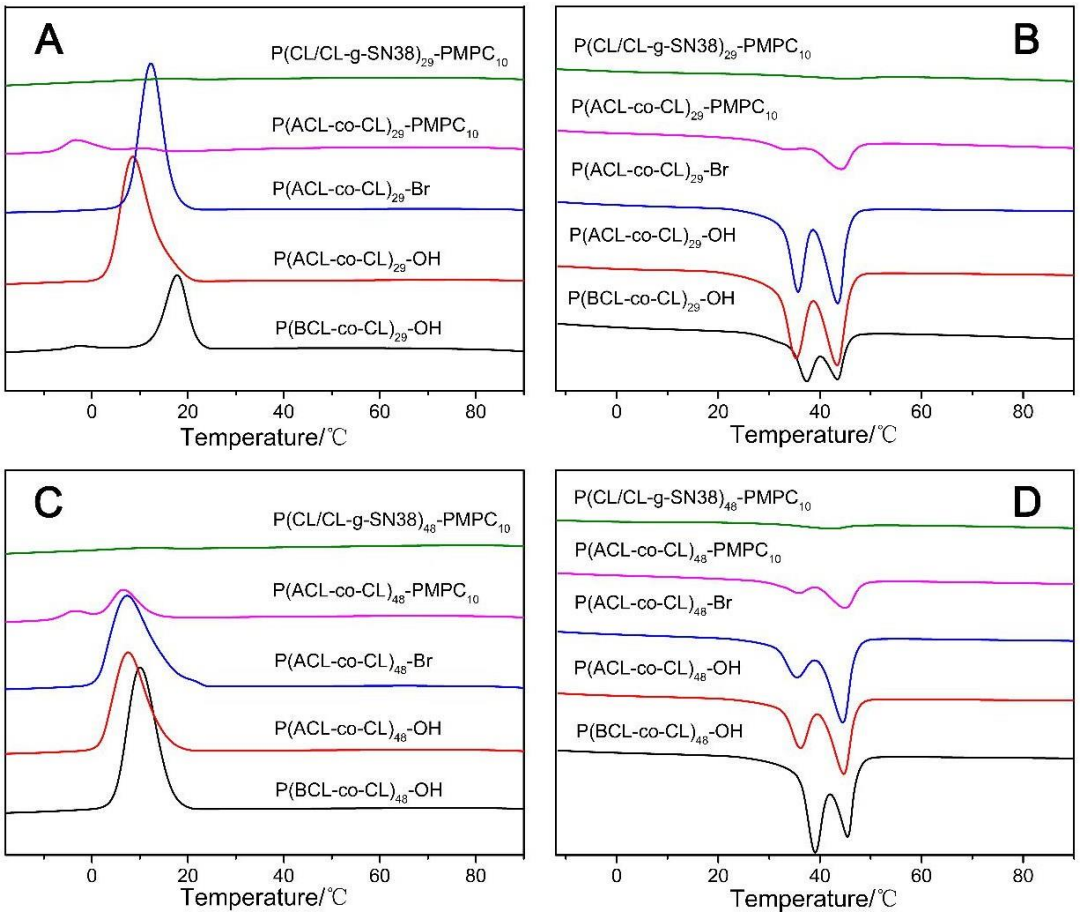

Figure S4 DSC curves of different polymers for heating (A,C) and cooling (B,D)

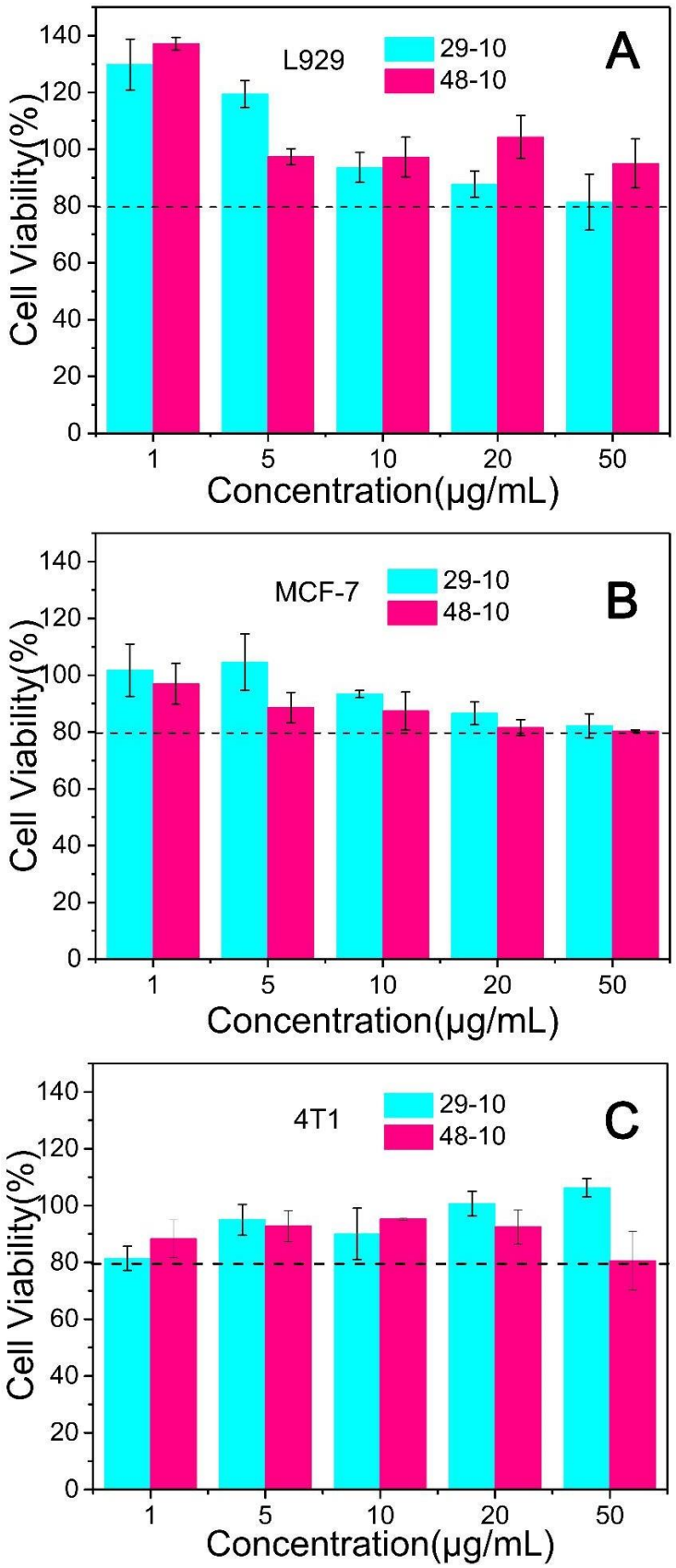

Figure S5 Cytotoxicity of blank micelles of P(ACL-co-CL)$_{29}$-PMPC$_{10}$ and P(ACL-co-CL)$_{48}$-PMPC$_{10}$ against L929 cells (A), MCF-7 cells (B) and 4T1 cells(C).

Table S1. In vitro growth inhibitory activity of SN38 and $P(CL/CL\text{-}g\text{-}SN38)_{48}\text{-}PMPC_{10}$ to MCF-7 and 4T1(MTT assay) (48 h treatment).

Cell	$IC_{50}(\mu g\ mL^{-1})$	
	SN38	$P(CL/CL\text{-}g\text{-}SN38)_{48}\text{-}PMPC_{10}$
MCF-7	0.16	0.27
4T1	8.04	24.06

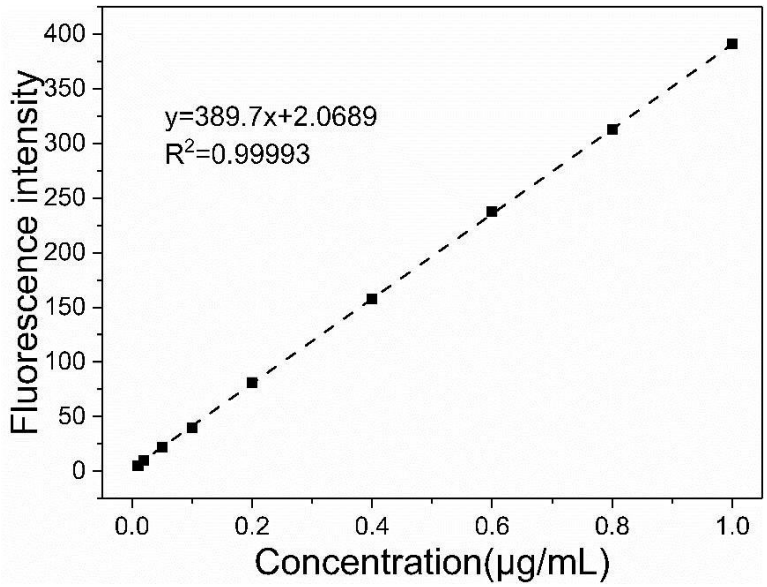

Figure S6 The standard curve of SN38 in DMSO by Flourescence spectrophotometer.