Supplementary Materials

pH-Responsive Nanogels from Bioinspired Comb-like Polymers with Hydrophobic Grafts for Effective Oral Delivery

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Table S1. Grafting ratio of alkylamines with different chain length onto PLP. The specific quantities used for synthesis of comb-like polymer are provided.

Polymer abbreviation	Side Chain length	Grafting ratio (%)	PLP (g)	NDA (mg)	TDA (mg)	ODA (mg)
PLP-NDA 10%	C_{10}	10	1	56.98	/	/
PLP-NDA 20%	C_{10}	20	1	113.96	/	/
PLP-NDA 30%	C_{10}	30	1	170.90	/	/
PLP-TDA 10%	C_{14}	10	1	/	77.32	/
PLP-TDA 20%	C_{14}	20	1	/	154.65	/
PLP-TDA 30%	C_{14}	30	1	/	231.97	/
PLP-ODA 10%	C_{18}	10	1	/	/	97.66
PLP-ODA 20%	C_{18}	20	1	/	/	195.32
PLP-ODA 30%	C_{18}	30	1	/	/	292.98

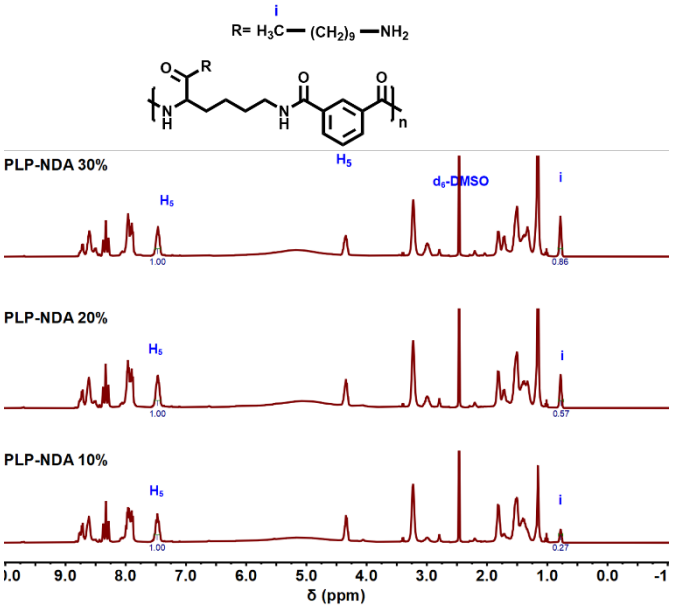

Figure S1. ^{1}H NMR spectra of PLP-NDA polymer samples with different grafting ratios.

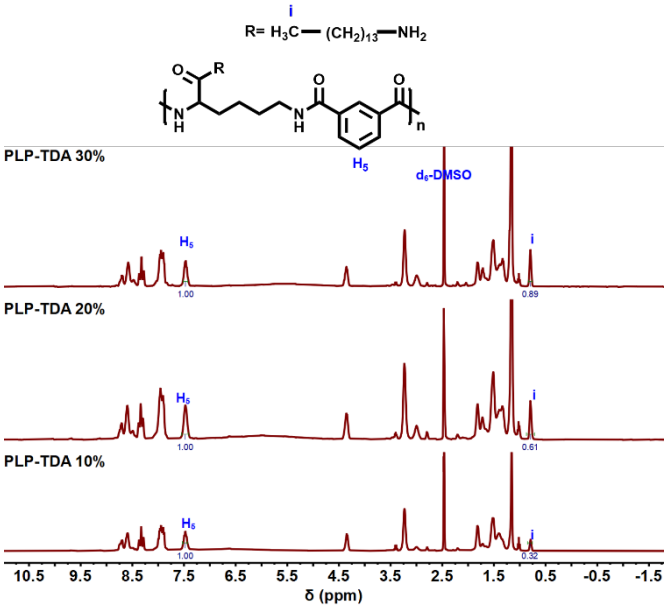

Figure S2. ^{1}H NMR spectra of PLP-TDA polymer samples with different grafting ratios.

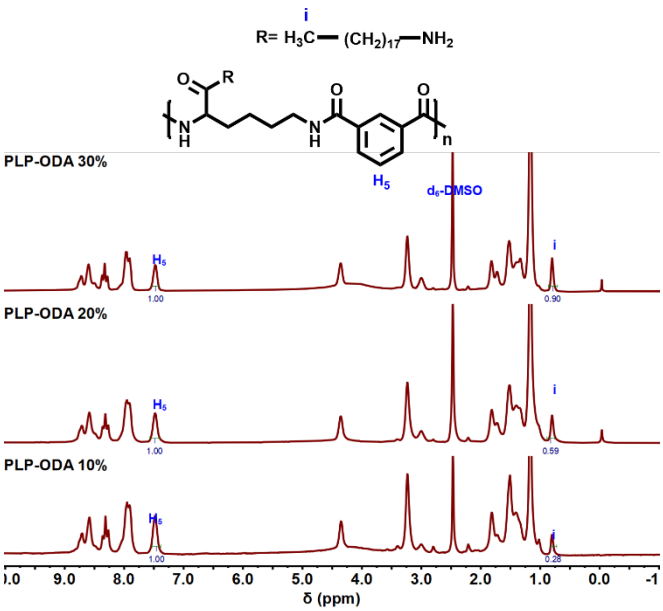

Figure S3. ^{1}H NMR spectra of PLP-ODA polymer samples with different grafting ratios.

Table S2. pH_P and CAC value of PLP and its comb-like derivatives.

	pH_P	**CAC (μg/mL)**
PLP	4.0	50.0
PLP-NDA 10%	4.0	40.0
PLP-NDA 20%	4.5	20.0
PLP-NDA 30%	5.0	10.0
PLP-TDA 10%	4.0	30.0
PLP-TDA 20%	4.5	10.0
PLP-TDA 30%	4.5	5.0
PLP-ODA 10%	5.5	5.0
PLP-ODA 20%	5.5	5.0
PLP-ODA 30%	7.4	4.0

Table S3. PDI of nanogels during 30 days storage at 4℃.

PDI \ Days	0 d	7 d	14 d	30 d
PLP-NDA 10% nanogel	0.13 ± 0.01	0.20 ± 0.01	0.18 ± 0.01	0.19 ± 0.00
PLP-NDA 20% nanogel	0.08 ± 0.00	0.10 ± 0.01	0.14 ± 0.02	0.12 ± 0.00
PLP-NDA 30% nanogel	0.10 ± 0.00	0.10 ± 0.02	0.09 ± 0.01	0.08 ± 0.02
PLP-TDA 10% nanogel	0.12 ± 0.01	0.20 ± 0.03	0.15 ± 0.03	0.19 ± 0.03
PLP-TDA 20% nanogel	0.10 ± 0.02	0.09 ± 0.00	0.12 ± 0.04	0.28 ± 0.01
PLP-TDA 30% nanogel	0.10 ± 0.01	0.11 ± 0.09	0.12 ± 0.05	0.18 ± 0.02
PLP-ODA 10% nanogel	0.22 ± 0.05	0.27 ± 0.09	0.31 ± 0.01	0.31 ± 0.03
PLP-ODA 20% nanogel	0.22 ± 0.09	0.24 ± 0.03	0.32 ± 0.06	0.21 ± 0.01
PLP-ODA 30% nanogel	0.37 ± 0.01	0.39 ± 0.03	0.49 ± 0.12	0.40 ± 0.21

Table S4. Encapsulation efficiency (EE) and drug loading capacity (DLC) of camptothecin in nanogels prepared by various polymers.

	EE (%)	DLC (%)
PLP-NDA 10% nanogel	18.81 ± 0.79	1.71 ± 0.07
PLP-NDA 20% nanogel	18.85 ± 0.60	1.71 ± 0.05
PLP-NDA 30% nanogel	34.57 ± 0.24	3.14 ± 0.02
PLP-TDA 10% nanogel	15.76 ± 0.44	1.43 ± 0.04
PLP-TDA 20% nanogel	39.85 ± 9.62	3.62 ± 0.87
PLP-TDA 30% nanogel	47.50 ± 3.12	4.31 ± 0.28
PLP-ODA 10% nanogel	29.11 ± 0.28	2.64 ± 0.02
PLP-ODA 20% nanogel	34.18 ± 3.18	3.10 ± 0.28
PLP-ODA 30% nanogel	38.03 ± 0.35	3.45 ± 0.03