Antibacterial Property of Synthesized Cyclic and Linear Cationic Copolymers

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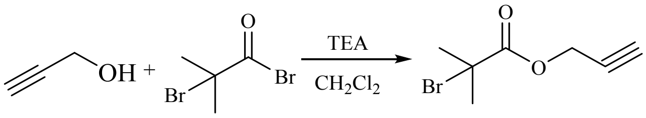

Scheme S1. Synthesis of ATRP initiator prop-2-yn-1-yl-2-bromo-2-methylpropanoate (PBiB).

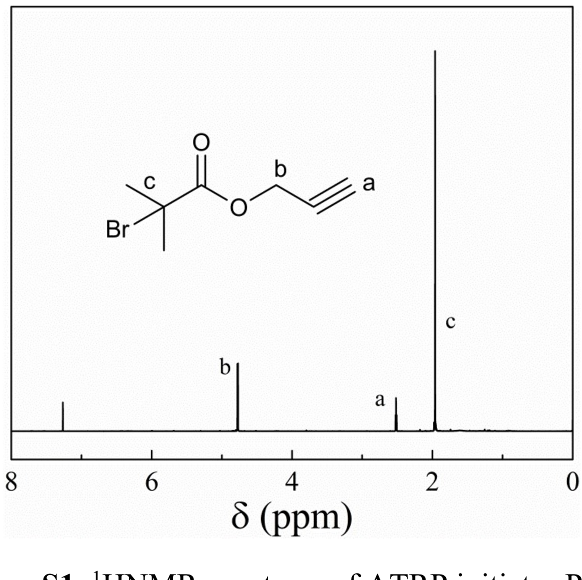

Figure S1. ^{1}HNMR spectrum of ATRP initiator PBiB.

Table S1. Characterization data of the synthesized linear and cyclic copolymers.

Samples	$M_{n,GPC}$×10^{-4}(g/mol) [a]	$Đ$ [a]
Linear P(DMAEMA70-*co*-MMA30)	0.72	1.38
Cyclic P(DMAEMA70-*co*-MMA30)	0.69	1.37
Linear P(DMAEMA55-*co*-MMA45)	0.69	1.32
Cyclic P(DMAEMA55-*co*-MMA45)	0.65	1.33
Linear P(DMAEMA40-*co*-MMA60)	0.58	1.34
Cyclic P(DMAEMA40-*co*-MMA60)	0.54	1.31
Linear P(DMAEMA50-*co*-BMA50)	0.67	1.40
Cyclic P(DMAEMA50-*co*-BMA50)	0.64	1.38
Linear P(DMAEMA40-*co*-BMA60)	0.60	1.37
Cyclic P(DMAEMA40-*co*-BMA60)	0.55	1.35
Linear P(DMAEMA30-*co*-BMA70)	0.57	1.36
Cyclic P(DMAEMA30-*co*-BMA70)	0.54	1.35
Linear P(DMAEMA70-*co*-*t*BMA30)	0.75	1.46
Cyclic P(DMAEMA70-*co*-*t*BMA30)	0.72	1.44
Linear P(DMAEMA60-*co*-*t*BMA40)	0.69	1.37
Cyclic P(DMAEMA60-*co*-*t*BMA40)	0.62	1.35
Linear P(DMAEMA50-*co*-*t*BMA50)	0.63	1.33
Cyclic P(DMAEMA50-*co*-*t*BMA50)	0.60	1.35

[a] DMF was used as the eluent at flow rate of 1 mL/min.

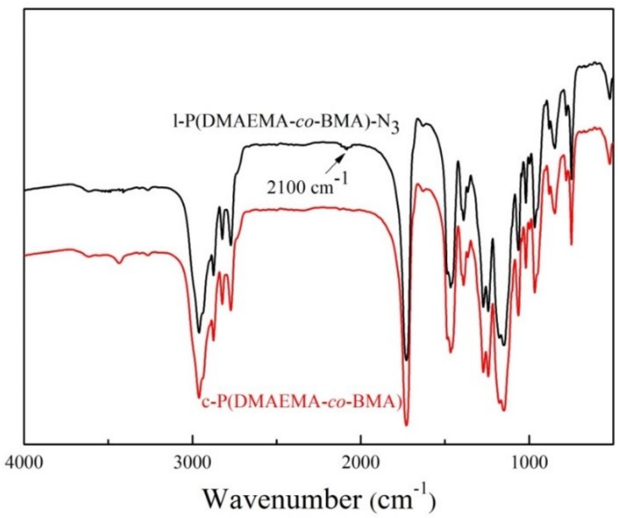

Figure S2. FT-IR spectra of linear and cyclic P(DMAEMA50-*co*-BMA50) copolymers.

Table S2. Characterization data of the linear and cyclic copolymers after quaternization.

Samples	$M_{n,GPC}$×10⁻⁴(g/mol) [a]	$Đ$ [a]	Zeta-potential (mv)	Diameter (nm)
Linear P(DMAEMA+70-*co*-MMA30)	1.40	1.30	55±2	60±2
Cyclic P(DMAEMA+70-*co*-MMA30)	1.37	1.28	56±3	55±3
Linear P(DMAEMA+55-*co*-MMA45)	1.18	1.30	22±5	169±4
Cyclic P(DMAEMA+55-*co*-MMA45)	1.14	1.31	20±4	150±5
Linear P(DMAEMA+40-*co*-MMA60)	0.96	1.29	18±2	190±2
Cyclic P(DMAEMA+40-*co*-MMA60)	0.93	1.28	17±2	178±4
Linear P(DMAEMA+50-*co*-BMA50)	1.28	1.34	20±3	190±3
Cyclic P(DMAEMA+50-*co*-BMA50)	1.26	1.33	19±4	174±2
Linear P(DMAEMA+40-*co*-BMA60)	0.99	1.31	16±3	210±2
Cyclic P(DMAEMA+40-*co*-BMA60)	0.98	1.30	15±2	200±2
Linear P(DMAEMA+30-*co*-BMA70)	0.79	1.34	16±2	236±6
Cyclic P(DMAEMA+30-*co*-BMA70)	0.77	1.31	15±2	200±9
Linear P(DMAEMA+70-*co*-*t*BMA30)	1.19	1.39	55±2	78±2
Cyclic P(DMAEMA+70-*co*-*t*BMA30)	1.18	1.38	53±4	65±1
Linear P(DMAEMA+60-*co*-*t*BMA40)	1.08	1.29	15±3	150±4
Cyclic P(DMAEMA+60-*co*-*t*BMA40)	1.06	1.28	17±1	137±6
Linear P(DMAEMA+50-*co*-*t*BMA50)	0.95	1.28	12±2	240±2
Cyclic P(DMAEMA+50-*co*-*t*BMA50)	0.92	1.26	11±3	231±3

[a] CH_3COONa/CH_3COOH buffer (pH = 4.6, 0.5 mol/L) was used as the eluent at a flow rate of 1 mL/min.

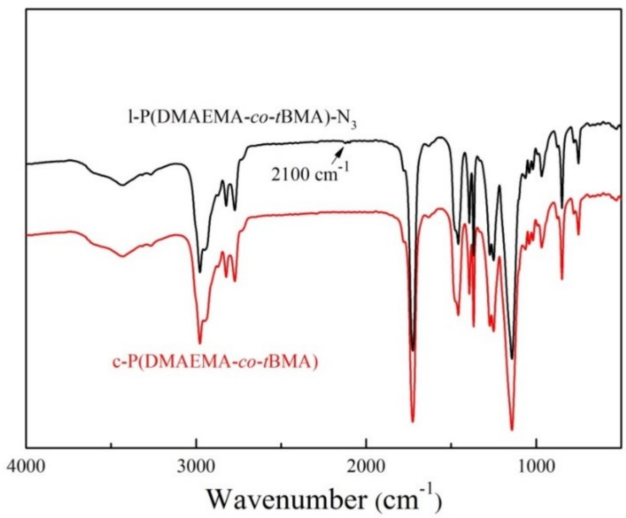

Figure S3. FT-IR spectra of linear and cyclic P(DMAEMA50-*co*-*t*BMA50) copolymers.

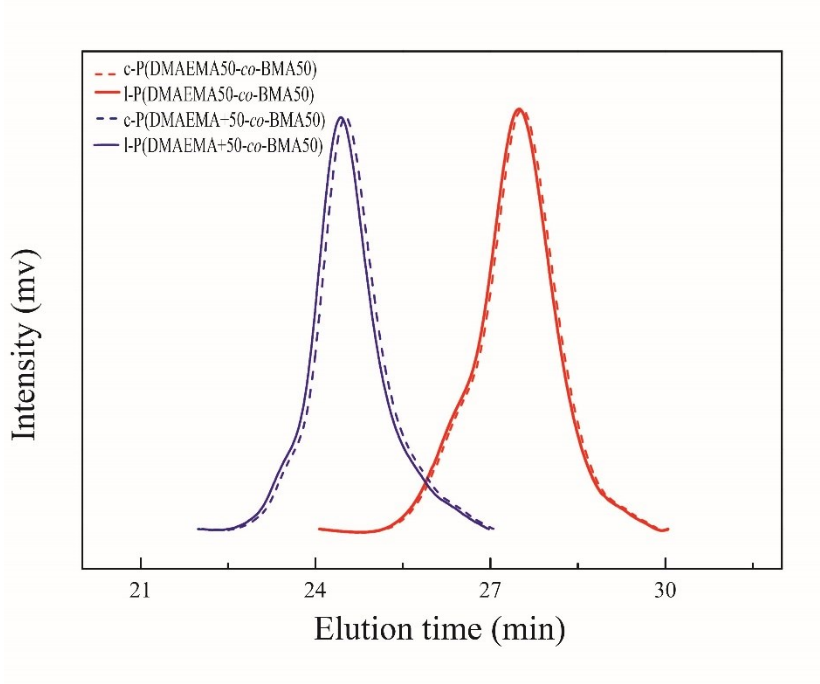

Figure S4. GPC curves of linear (solid curves) and cyclic (dashed curves) P(DMAEMA50-*co*-BMA50) (red curves) and P(DMAEMA+50-*co*-BMA50) (blue curves) copolymers.

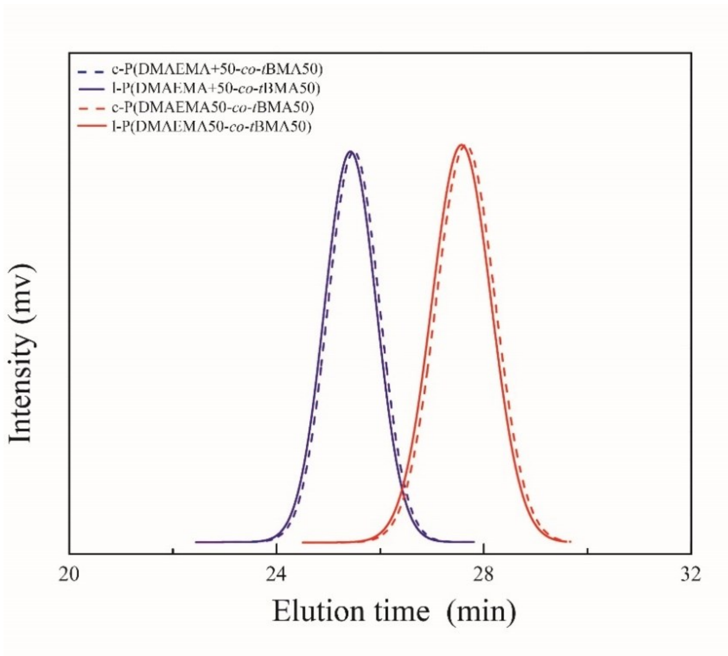

Figure S5. GPC curves of linear (solid curves) and cyclic (dashed curves) P(DMAEMA50-*co*-*t*BMA50) (red curves) and P(DMAEMA+50-*co*-*t*BMA50) (blue curves) copolymers.

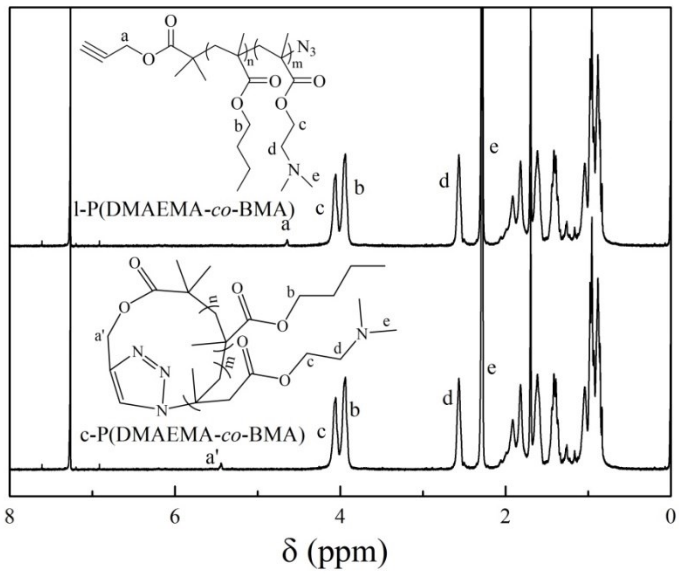

Figure S6. [1]H NMR spectra of linear and cyclic P(DMAEMA50-*co*-BMA50) copolymers.

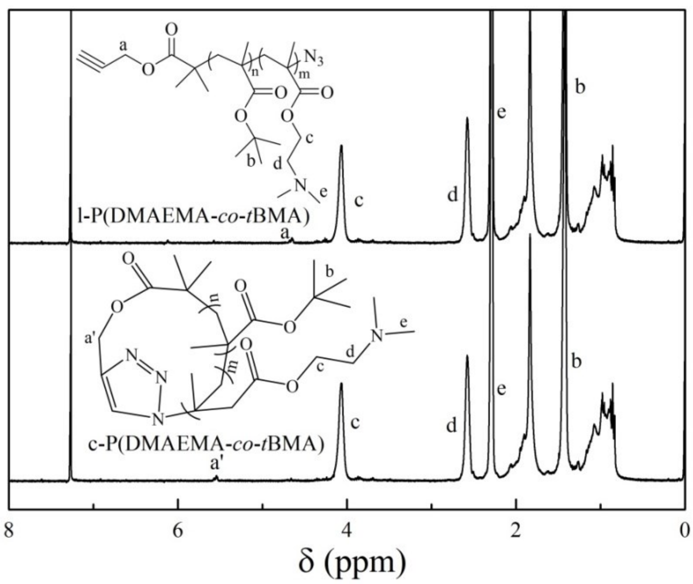

Figure S7. [1]H NMR spectra of linear and cyclic P(DMAEMA50-*co*-*t*BMA50) copolymers.

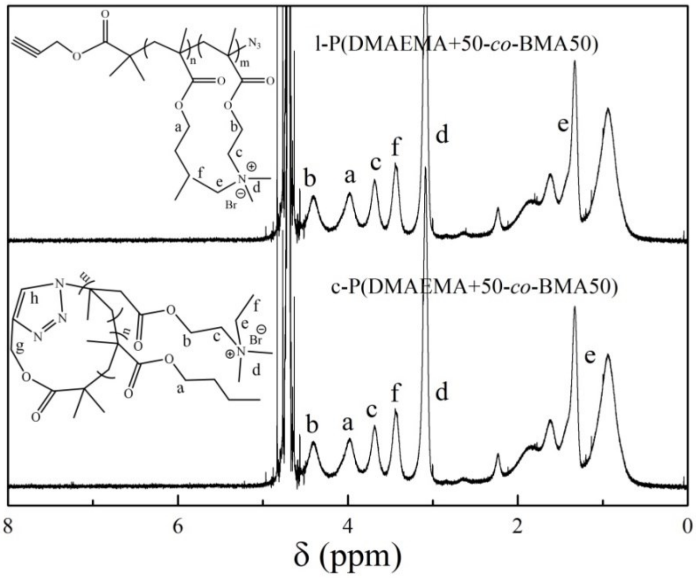

Figure S8. [1]H NMR spectra of linear and cyclic cationic P(DMAEMA+50-*co*-BMA50) copolymers.

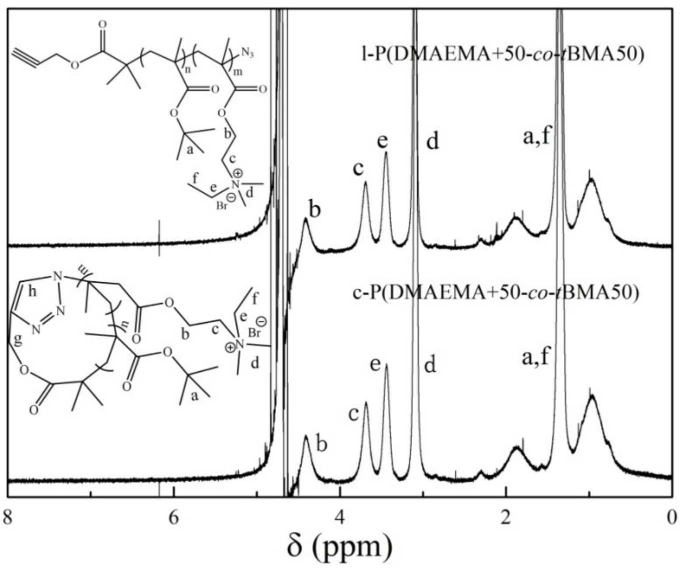

Figure S9. ^{1}H NMR spectra of linear and cyclic cationic P(DMAEMA+50-*co*-*t*BMA50) copolymers.