Supporting Information

of

Optimization of Brush-like Cationic Copolymers for Non-viral Gene Delivery

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1. Table S1 & S2

2. Figure S1-S5

Table S1. Summary of $P(GMA)_{50}$-*b*-P(HPMA) prepared at different polymerization time using $P(GMA)_{50}$ as a macro-CTA.

Condition	No.	Time (min)	Conv. (%)	Real structure determined by NMR
[M]:[Macro-CTA]:[I] = 300:1:0.33 [M] = 1.0 M, T = 70 °C	1	40	5.8	$P(GMA)_{50}$-*b*-$P(HPMA)_{18}$
	2	90	9.9	$P(GMA)_{50}$-*b*-$P(HPMA)_{33}$
	3	280	16.8	$P(GMA)_{50}$-*b*-$P(HPMA)_{49}$
	4	480	27.2	$P(GMA)_{50}$-*b*-$P(HPMA)_{83}$

Table S2. Summary of $P(GMA)_{50}$-*b*-P(OEGMA) prepared at different polymerization time using $P(GMA)_{50}$ as a macro-CTA.

Condition	No.	Time (min)	Conv. (%)	Real structure determined by NMR
[M]:[Macro-CTA]:[I] = 200:1:0.33, [M] = 1.0 M, T = 70 °C	1	10	3.0	$P(GMA)_{50}$-*b*-$P(OEGMA300)_{6}$
	2	20	5.5	$P(GMA)_{50}$-*b*-$P(OEGMA300)_{11}$
	3	30	7.5	$P(GMA)_{50}$-*b*-$P(OEGMA300)_{15}$
	4	40	11.5	$P(GMA)_{50}$-*b*-$P(OEGMA300)_{23}$

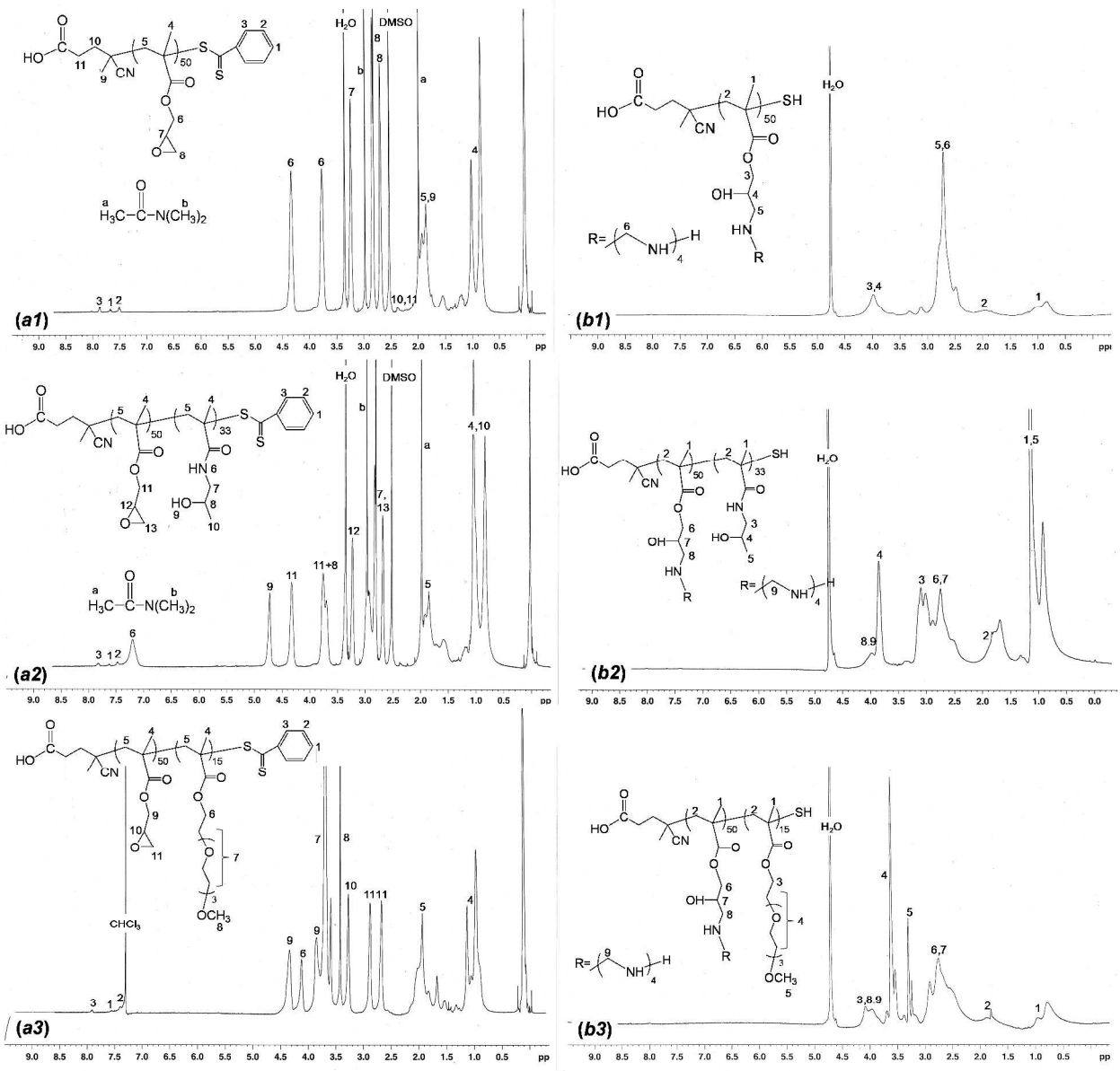

Figure S1.[1]H NMR spectra of (a1) $P(GMA)_{50}$ in DMSO; (a2) $P(HPMA)_{33}$-*b*-$P(GMA)_{50}$ in DMSO; (a3) $P(OEGMA)_{15}$-*b*-$P(GMA)_{50}$ in $CDCl_3$; (b1) $P(GMA\text{-}TEPA)_{50}$ in D_2O; (b2) $P(HPMA)_{33}$-*b*-$P(GMA\text{-}TEPA)_{50}$ in D_2O; (b3) $P(OEGMA)_{15}$-*b*-$P(GMA\text{-}TEPA)_{50}$ in D_2O.

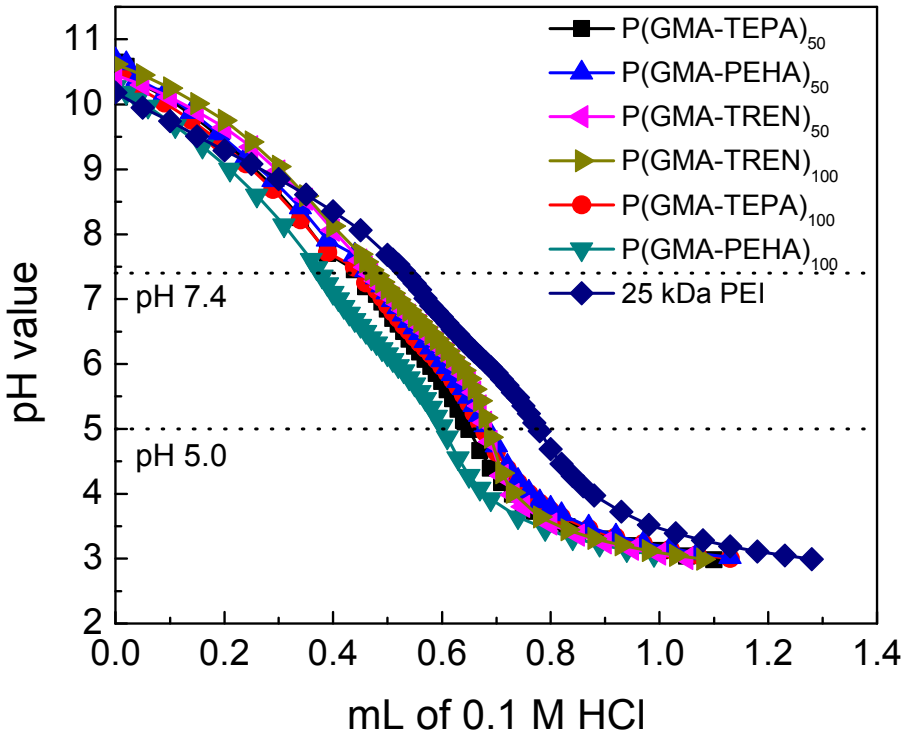

Figure S2. Buffering capacity of various P(GMA-oligoamine)$_{50/100}$ obtained by titrating polymer aqueous solution (0.2 mg/mL) in 0.15 M aqueous NaCl (pH 10, adjusted with NaOH) with 0.1 M HCl. As a reference, the titration curve of 25 kDa bPEI is also presented.

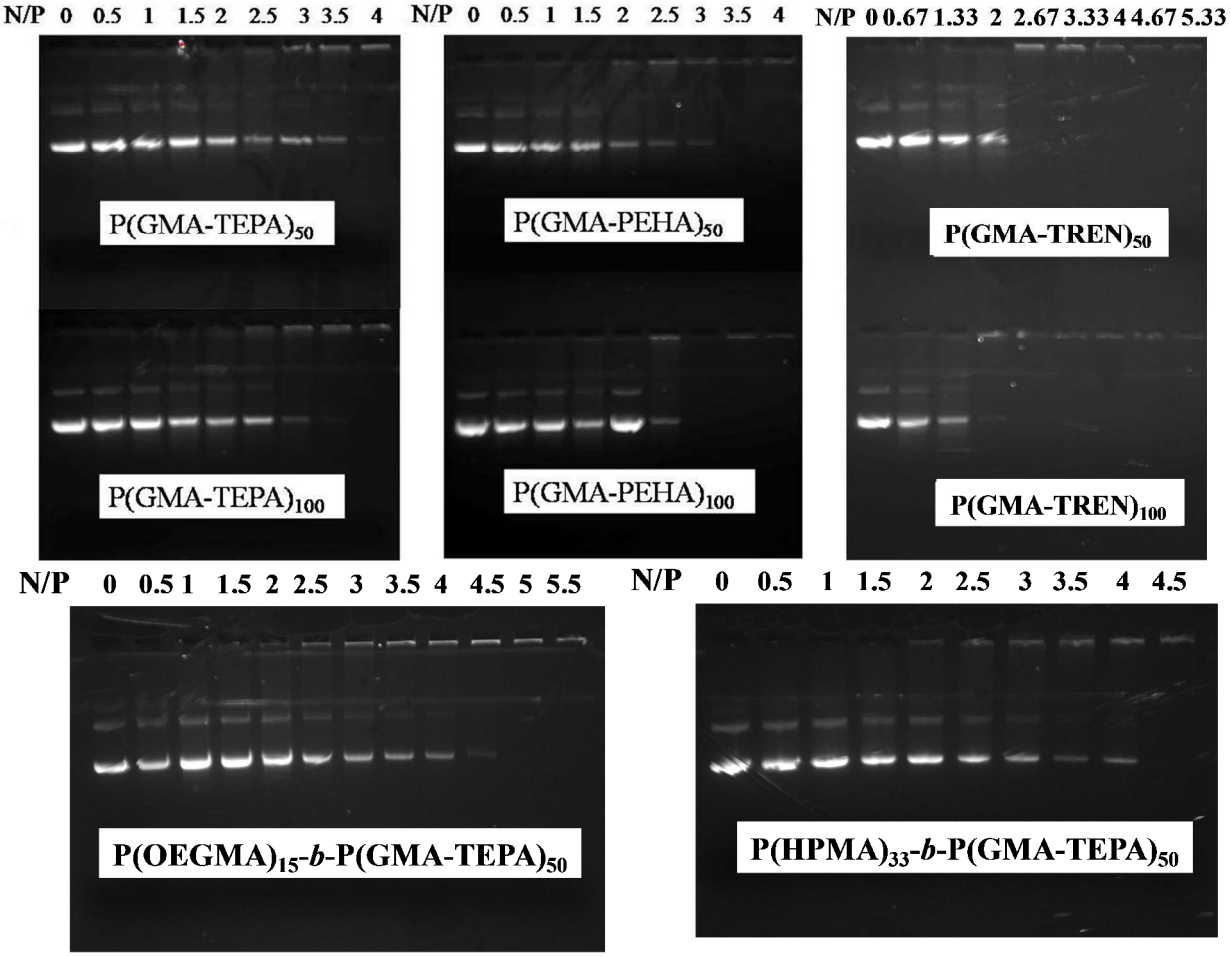

Figure S3. Agarose gel electrophoresis of various P(GMA-oligoamine) polyplexes formed by complexation with plasmid DNA at N/P ratios ranging from 0/1 to 5.5/1.

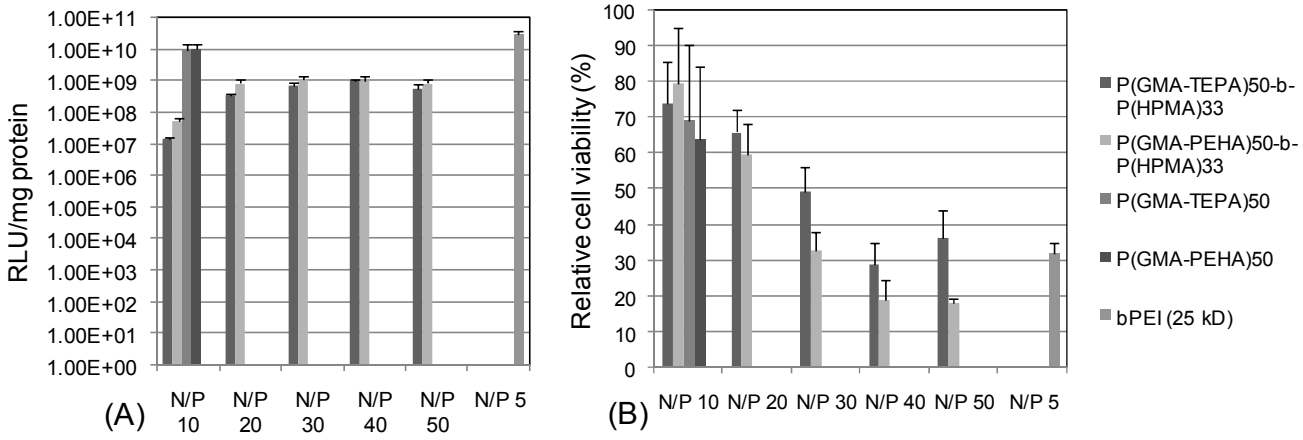

Figure S4. Transfection efficiency (A) and relative cell viability (B) of polyplexes formed by $P(HPMA)_{33}$-*b*-$P(GMA\text{-}TEPA/PEHA)_{50}$. Data are shownas mean ± SD (n = 3).

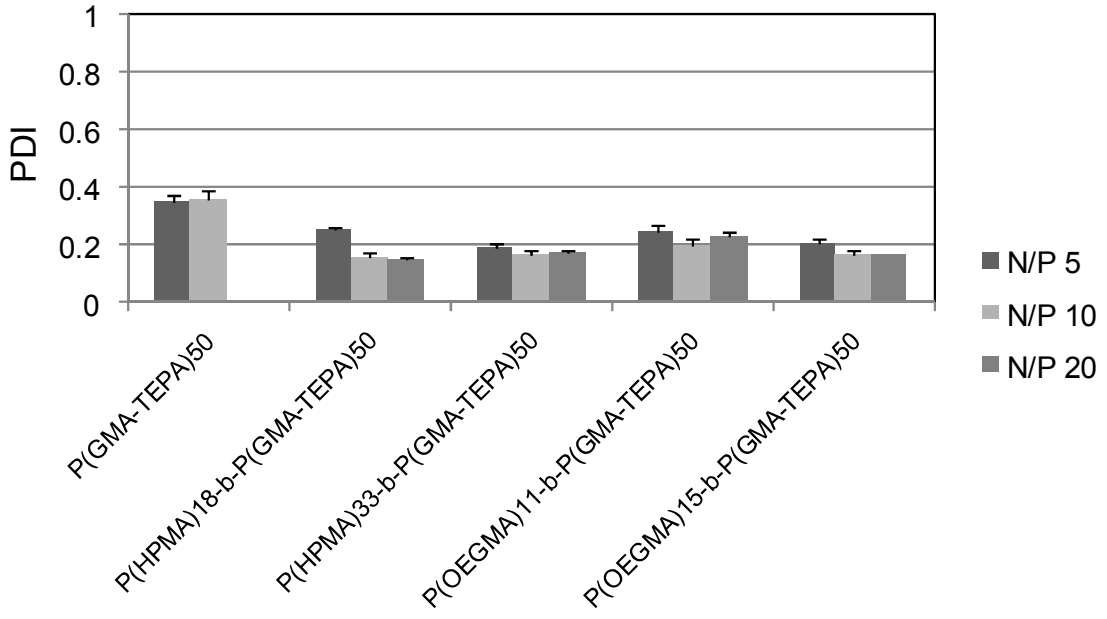

Figure S5. Average size distributions (PDIs) of various polyplexes formed at different N/P ratios in 150 mM PBS.