Poly(ethylene oxide) Grafted with Short Polyethylenimine Gives DNA Polyplexes with Superior Colloidal Stability, Low Cytotoxicity and Potent *In Vitro* Gene Transfection Under Serum Conditions

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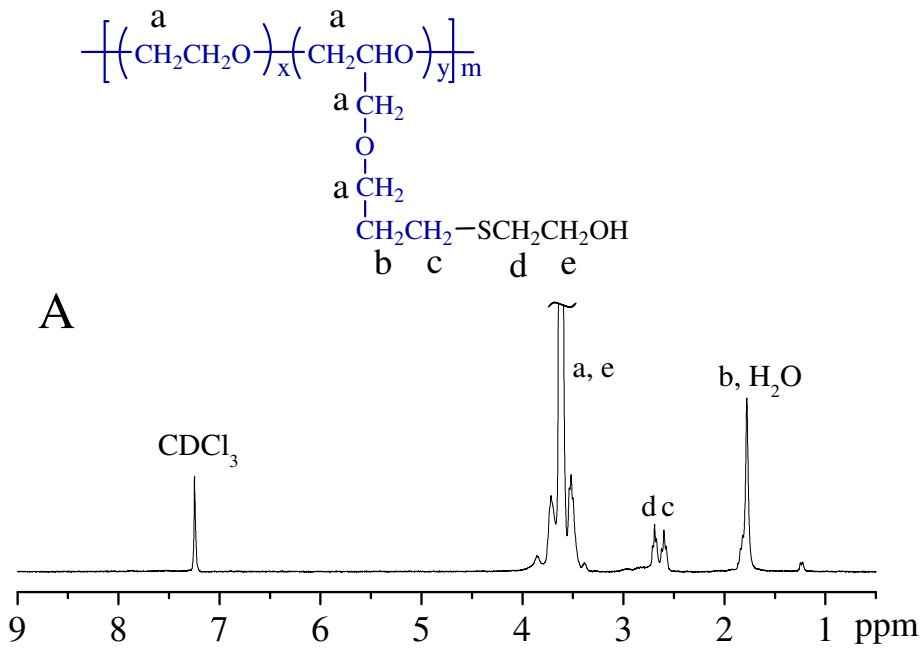
Table S1. Synthesis of functional PEO containing multiple pendant allyl groups (PEO-*g*-allyl) by anionic ring opening copolymerization of EO and AGE.

entry	polymer [a]	M_n (kg/mol)			PDI [b]	f_{AGE} [c]	F_{AGE} [d]	N_{allyl} [e]
		design	^{1}H NMR	GPC [b]		(%)	(%)	
1	PEO(13k)-*g*-14allyl	20.0	13.3	11.2	1.15	6.0	5.0	14
2	PEO(24k)-*g*-12allyl	35.0	24.0	19.5	1.20	3.0	2.3	12
3	PEO(13k)-*g*-28allyl	20.0	13.0	9.5	1.18	15.0	11.2	28

[a] PEO(x)-*g*-yPEI wherein x represents molecular weight of PEO and y the number of allyl in every PEO chain. [b] Determined by GPC measurements (eluent: THF, flow rate: 0.6 mL/min, PEO standards). [c] Mole percent of AGE in the feed. [d] Mole percent of AGE in the copolymer determined by ^{1}H NMR. [e] Number of allyl group per polymer chain determined by ^{1}H NMR.



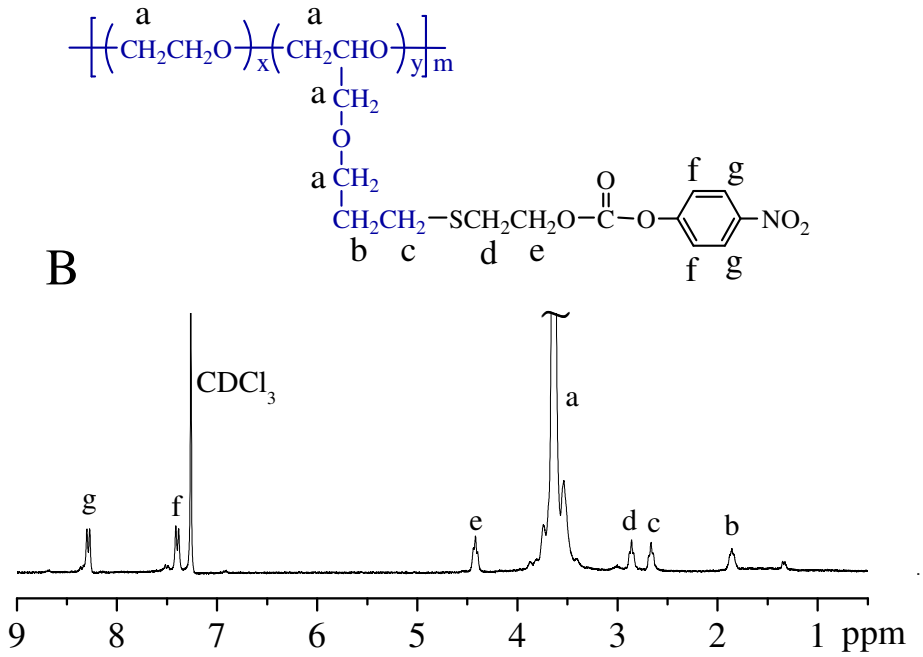


Figure S1. ^{1}H NMR spectra (400 MHz, $CDCl_3$) of (A) PEO(13k)-*g*-OH and (B) PEO(13k)-*g*-NC.

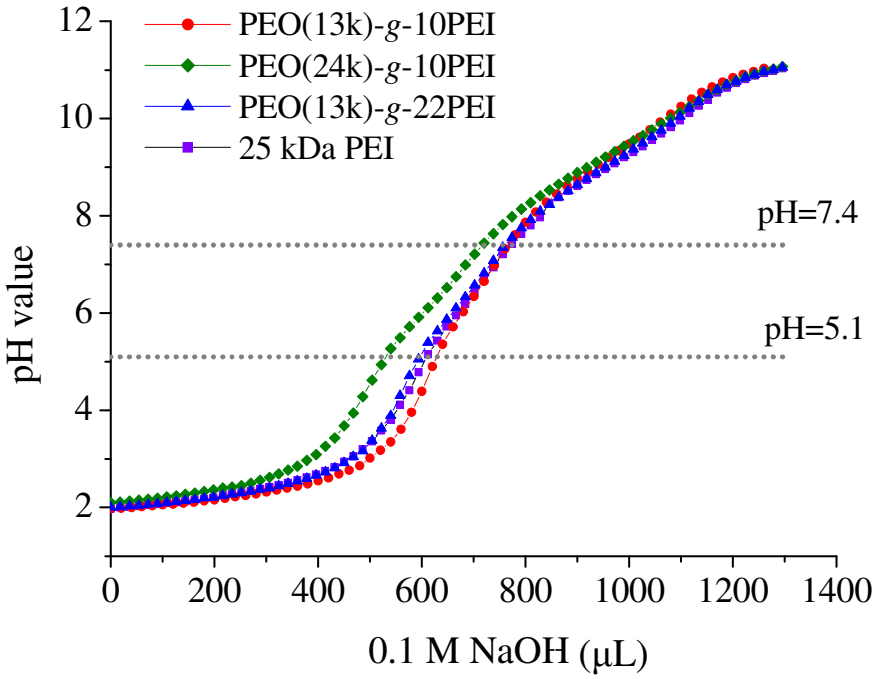


Figure S2. Acid-base titration curves of PEO-*g*-PEI in 150 mM aqueous NaCl (from pH 2 to ca. pH 11 with 0.1M NaOH). For comparison, the titration curve of 25 kDa PEI is also presented.

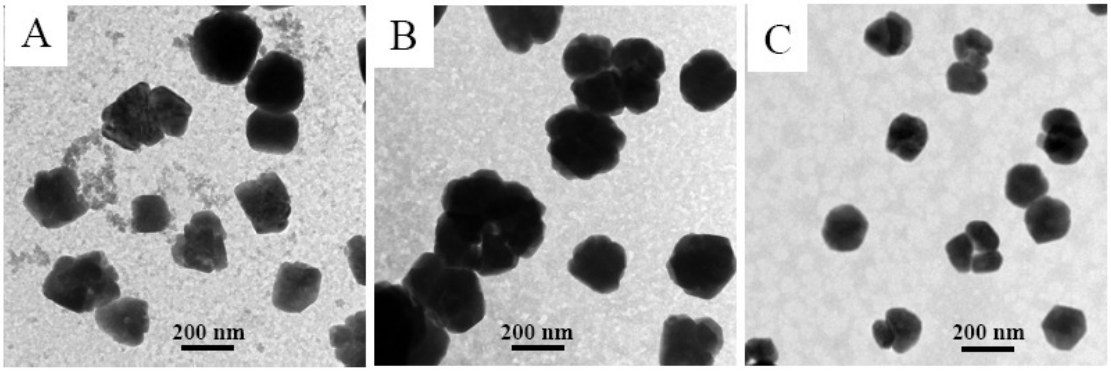


Figure S3. TEM images of PEO-*g*-PEI polyplexes at an N/P ratio of 20/1. (A) PEO(13k)-*g*-10PEI; (B) PEO(24k)-*g*-10PEI; (C) PEO(13k)-*g*-22PEI.