

Supporting Information

Bryson et al. 10.1073/pnas.0904860106

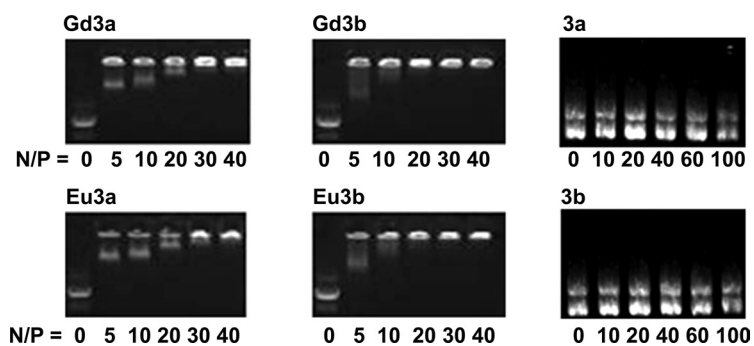


Fig. S1. Agarose gel electrophoresis shift assays that allow observation of **Gd3a**, **Gd3b**, **Eu3a**, and **Eu3b** binding with pDNA at increasing N/P ratios from 0 to 40. Hindrance of pDNA migration is noted with all polymers at N/P = 5; however, migration is not completely hindered until N/P = 30 for **Eu3a** and **Gd3a** and N/P = 20 for **Gd3b** and **Eu3b**. Nonchelated polymers **3a** and **3b** do not hinder to pDNA migration in agarose gel and, thus, do not bind pDNA.

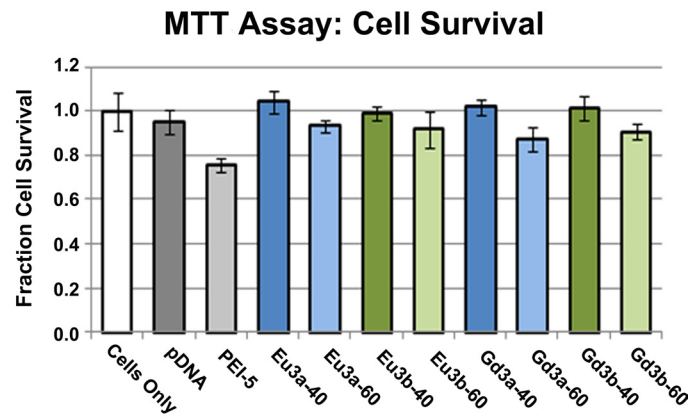


Fig. S3. Cell viability after exposure to polyplexes using unlabeled pDNA. Viability is reported as a measure of the MTT conversion normalized to untreated cells. The N/P ratio of the polyplex used is indicated after the polymer name on the x axis. Polyplexes were formed using the same methodology as the DLS studies.

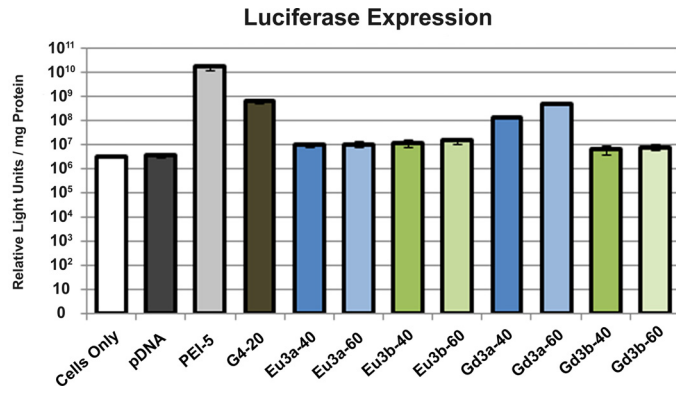


Fig. S4. Luciferase Expression in HeLa cells. Expression is reported as relative light units emitted by the catalyzed transformation of luciferin per milligram of protein. The N/P ratio of the polyplex used is indicated after the polymer name on the x axis. Polyplexes were formed using the same methodology as the DLS studies.

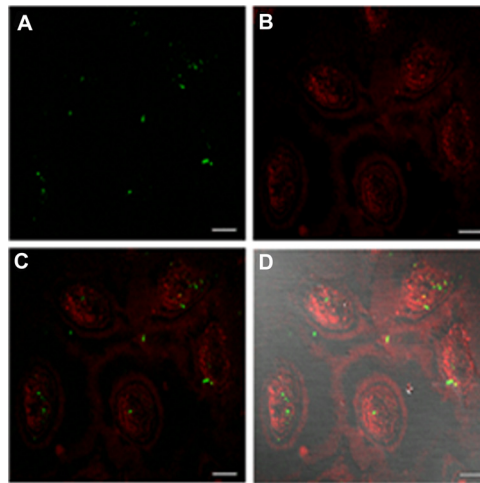
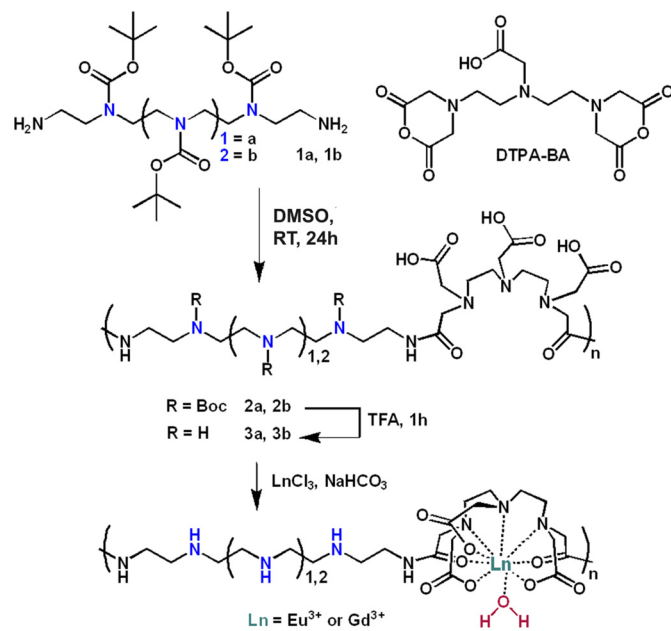


Fig. S5. Two-photon confocal image of FITC-labeled pDNA delivered with **Eu3a** at an N/P of 20. Infrared red laser was tuned to 780 nm to initiate Eu(III) excitation. Slice thickness 1.2 μm , 1.2 μm pinhole, 63 \times oil-immersion objective, numerical aperture 1.4. (Scale bar, 20 μm .) (A) FITC-pDNA fluorescence, (B) **Eu3a** luminescence, (C) FITC/**Eu3a** overlay, (D) FITC/Eu/DIC overlay. This image indicates that diffuse cytoplasm staining of **Eu3a** is similar at lower N/P ratios.



^aConditions: (i) DMSO, 25°C, 24h; (ii) TFA, CH_2Cl_2 ;
 (iii) $[\text{LnCl}_3] = 0.1 \text{ M}$, H_2O , NaHCO_3 pH = 6.

Scheme S1. Polymer synthetic scheme.

Table S1. FT-IR data for the polymers

Polymer	ν , cm^{-1}
2a	1,663.3; 1,712.3; 3,334.2
2b	1,666.3; 1,692.9; 3,346.3
3a	1,641.2; 1,692.9; 3,415.2
3b	1,650.8; 1,667.8; 3,419.2
Eu3a	1,585.4; 1,634.5; 3,419.4
Eu3b	1,585.2; 1,633.8; 3,419.9
Gd3a	1,587.2; 1,641.2; 3,433.7
Gd3a	1,586.1; 1,633.9; 3,419.6

Samples of each polymer (5 mg) were crushed by mortar and pestle with 20 mg of anhydrous KBr and compacted into a translucent pellet. Spectra were measured on a Perkin-Elmer Spectrum One Fourier transform infrared spectrometer.

Table S2. Ln quantification for the polymer series

Polymer	Calculated Ln content, %	Observed Ln content, %
Eu3a	21.8	21.8
Eu3b	20.5	20.4
Gd3a	22.5	22.8
Gd3a	21.1	21.9

The percentage of Ln by mass was determined by diluting polymer samples to the ppb range and analyzed by inductively coupled plasma MS. For each polymer, the signal integration was fitted to calibration curves generated from Ln standards.

Table S3. The weight averaged molecular weight (M_w), polydispersity (M_w/M_n), and degree of polymerization (n_w) for the polymers

Polymer	M_w , kDa	M_w/M_n	n_w
3a	43	1.7	78
3b	54	1.9	91
Eu3a	64	1.7	91
Eu3b	68	1.7	92
Gd3a	67	1.9	96
Gd3a	62	2.0	89

Other Supporting Information Files

[SI Appendix \(PDF\)](#)