

SUPPORTING INFORMATION

Table SI 1. Polydispersity (PDI) values of oligospermines polyplexes at different N/P ratios

Polymer used in polyplex	N/P ratio	PDI
Linear bispermine	2	0.301
	5	0.293
	10	0.141
Linear tetraspermine	2	0.26
	5	0.29
	10	0.34
Dendritic tetraspermine	2	0.36
	5	0.35
	10	0.22

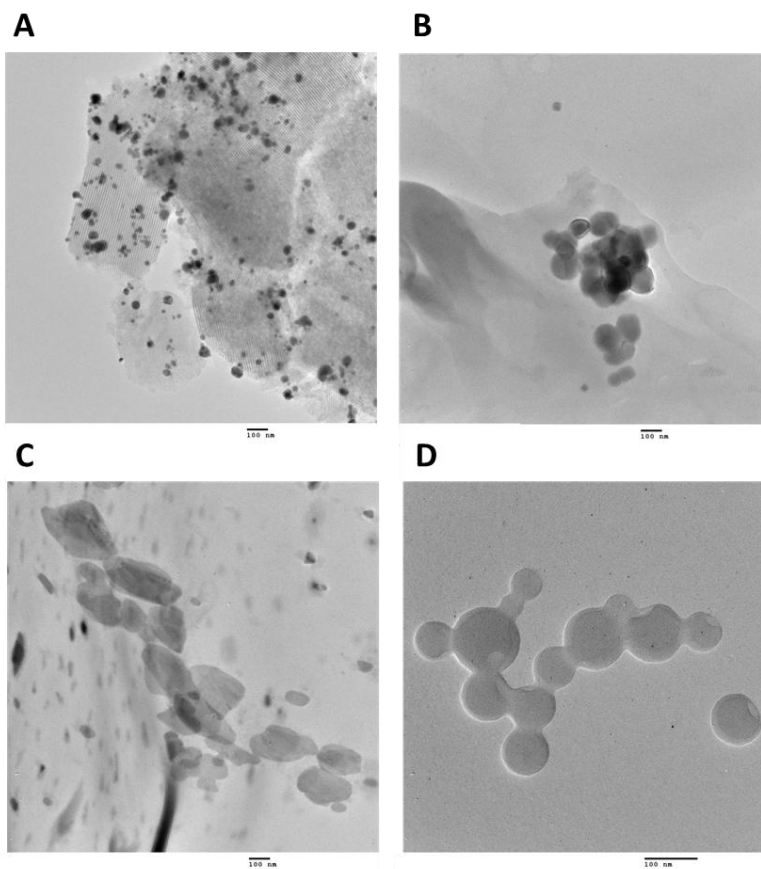


Figure SI 1. TEM images of polyplexes at N/P 2 with A) linear bispermine, B) linear tetraspermine, and C) dendritic tetraspermine showing different morphologies and average sizes

of 440 nm, 330 nm, and 189 nm respectively. D) Small spherical particles of size about 40 nm were confirmed by both TEM and AFM images in all oligospermine polyplexes.

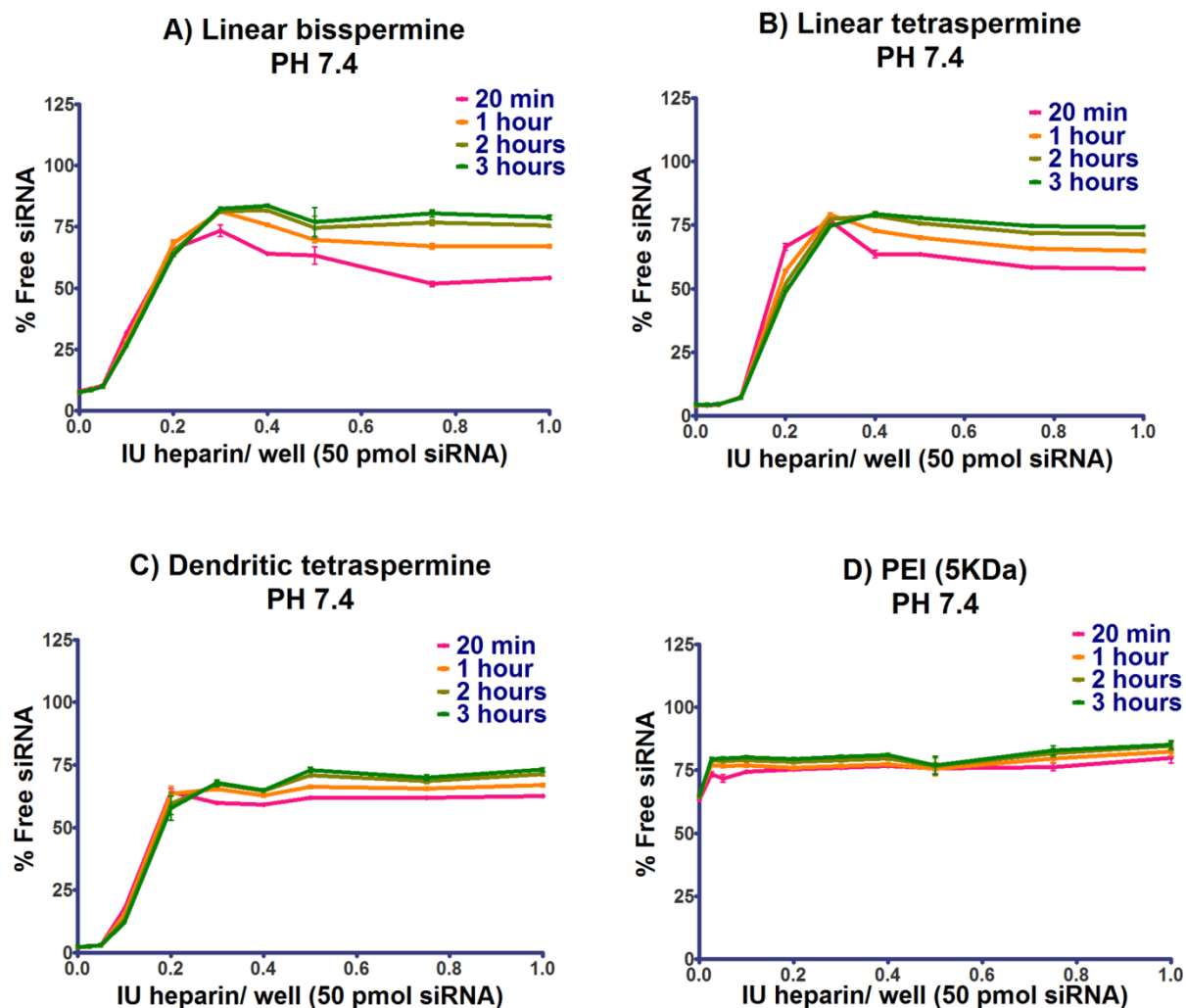


Figure SI 2. Development of the stability profiles against heparin polyanions for polyplexes with A) linear bispermine, B) linear tetraspermine, C) dendritic tetraspermine, and D) 5 kDa PEI at pH 7.4 after 20 minutes, 1 hour, 2 hours and 3 hours of incubation of the polyplexes with increasing concentrations of heparin. All oligospermine polyplexes showed a slight increase of released siRNA over time at pH 7.4.

At pH 7.4, linear bispermine polyplexes showed significant increase in siRNA release ($p < 0.0001$) over time compared to insignificant increases with other polymers (Figure SI 2). At pH 4.5, polyplexes made with the linear bispermine and linear tetraspermine showed significantly decreased siRNA release ($p < 0.0001$) over time which indicates a dynamic rearrangement of the polyplexes in presence of heparin. On the other hand, polyplexes made with the dendritic tetraspermine and PEI (5 kDa) showed significantly increased siRNA release ($p < 0.0001$) over time (Figure SI 3). These results showed higher stability of polyplexes in neutral medium than in acidic medium.

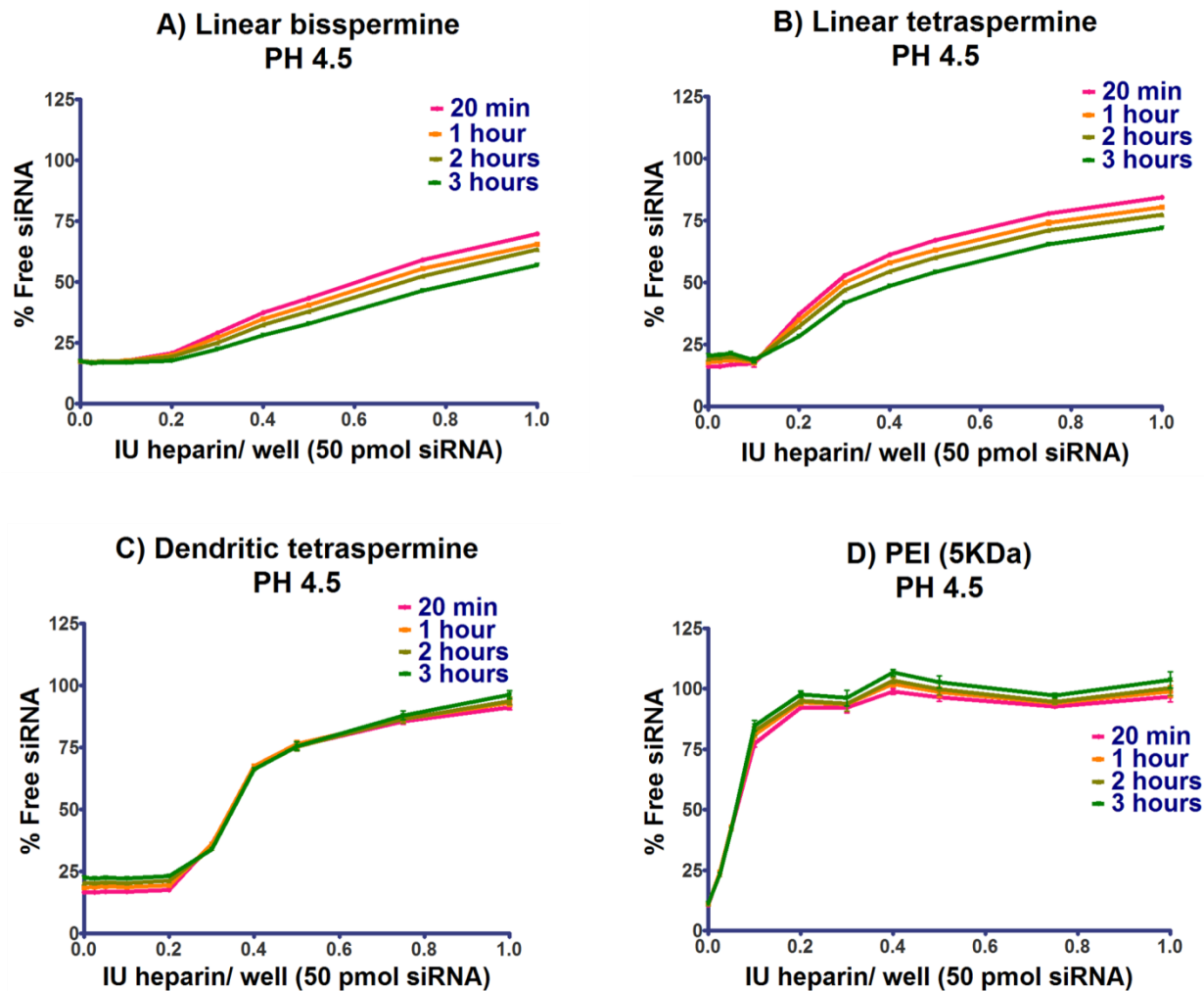


Figure SI 3. Development of the stability profiles against heparin polyanions for polyplexes with A) linear bispermine, B) linear tetraspermine, C) dendritic tetraspermine, and D) 5 kDa PEI at pH 4.5 after 20 minutes, 1 hour, 2 hours and 3 hours of incubation of the polyplexes with increasing concentrations of heparin. For polyplexes with linear bispermine and linear tetraspermine, the release of siRNA decreased over the time of incubation. In polyplexes with dendritic tetraspermine and PEI (5 kDa), the release of siRNA slightly increased over time at pH 4.5.