

Development of Poly (β -amino esters)-Based Biodegradable Nanoparticles for Non-Viral Delivery of Minicircle DNA

*Michael Keeney^{1 ‡}, Sang-Ging Ong^{2, 3 ‡}, Amanda Padilla¹, Zhenyu Yao¹, Stuart Goodman¹,
Joseph C Wu^{2, 3, 4, *}, Fan Yang^{1, 5 *}*

¹Department of Orthopedic Surgery, Stanford University, Stanford, CA 94305, USA

²Department of Medicine, Division of Cardiology, Stanford University, Stanford, CA 94305,
USA

³Stanford Cardiovascular Institute, Stanford University, Stanford, CA 94305, USA

⁴Institute for Stem Cell Biology and Regenerative Medicine, Stanford University, Stanford, CA
94305, USA

⁵Department of Bioengineering, Stanford University, Stanford, CA 94305, USA

Supporting Information

Human embryonic kidney (HEK) cells were transfected with minicircle or parental plasmid expressing green fluorescent protein (GFP). The mean fluorescent intensity of cells was determined by FACS analysis. The results are shown in Fig. S1.

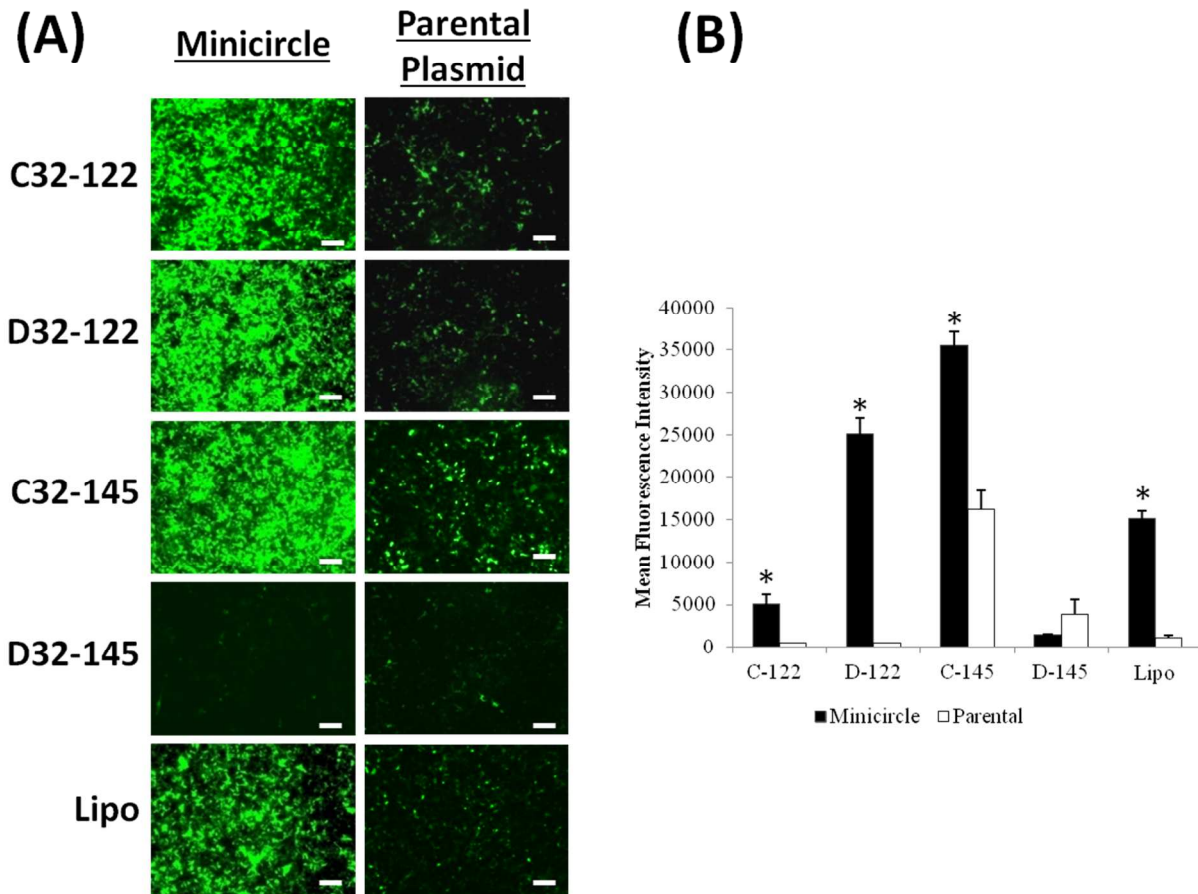


Figure S1. (A) Fluorescent images of HEK cells transfected with MC or parental plasmid encoding for GFP. (B) Mean fluorescent protein expression from transfected HEK cells as determined by FACS analysis. * indicates statistical difference within each group ($p < 0.05$).

The effect of polymer:MC weight ratio on transfection efficiency was also examined by fluorescence microscopy (Fig S2). A ratio of 10:1 was found suitable for all lead polymers. Although increasing polymer:MC weight ratio for some polymers resulted in a slight increase in efficiency, the level was far below that observed for the lead polymers. Given that cationic polymers may elicit a mild inflammatory response, a ratio of 10:1 was used for all polymers.

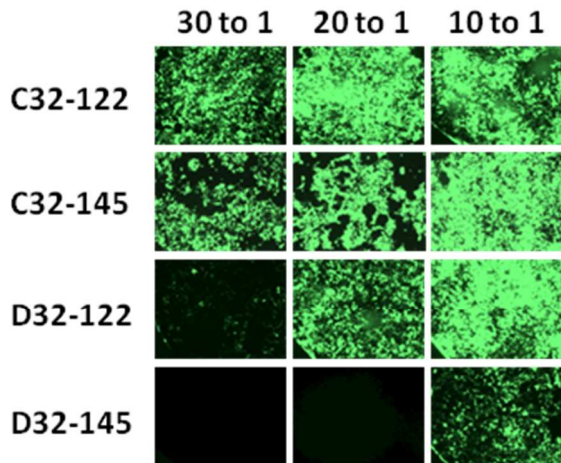


Figure S2. Fluorescent images of HEK cells transfected with MC encoding for GFP. Transfection was performed using lead polymer formulations at polymer:MC weight ratios of 10:1, 20:1 and 30:1.

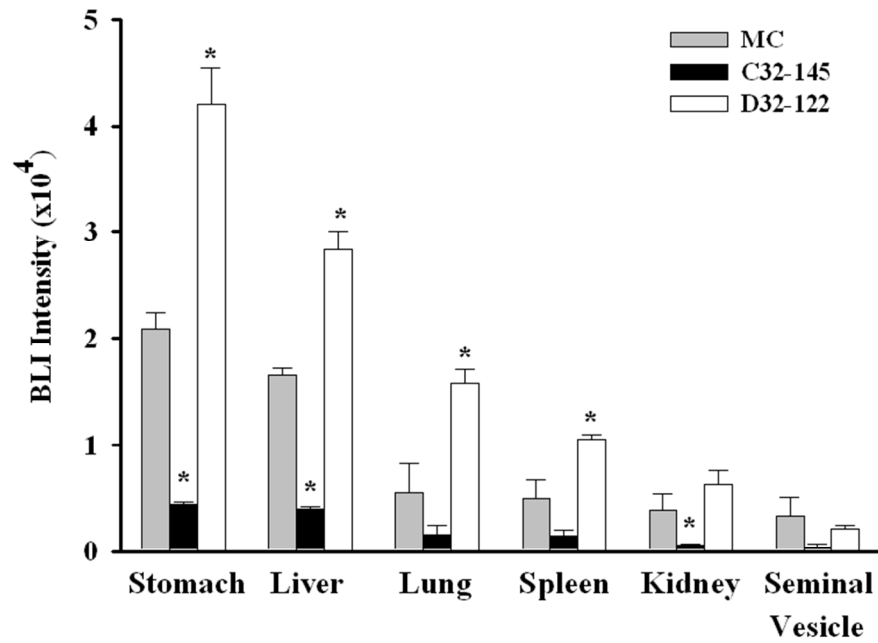


Figure S3. Quantification of luciferase expression in individual organs 24 hours after intraperitoneal injection. Data was presented as mean \pm standard error. * indicates statistical significance ($p < 0.05$).