Supporting Information

Polymeric Nanoparticles for Non-Viral Gene Therapy Extend Brain Tumor Survival *In Vivo*

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Polymer	B:S ratio	M_N	M_W	PDI
446	1.1:1	3342	6398	1.91
447	1.1:1	11345	36814	3.25
453	1.2:1	13719	110715	8.07
456	1.2:1	4208	7411	1.76
457	1.1:1	16005	62522	3.91
536	1.1:1	4876	8468	1.74
537	1.05:1	14899	35287	2.37

Table S1. Gel permeation chromatography (GPC) results of all polymers indicating the number average (M_N) and weight average (M_W) molecular weight and polydispersity (PDI) of each polymer.

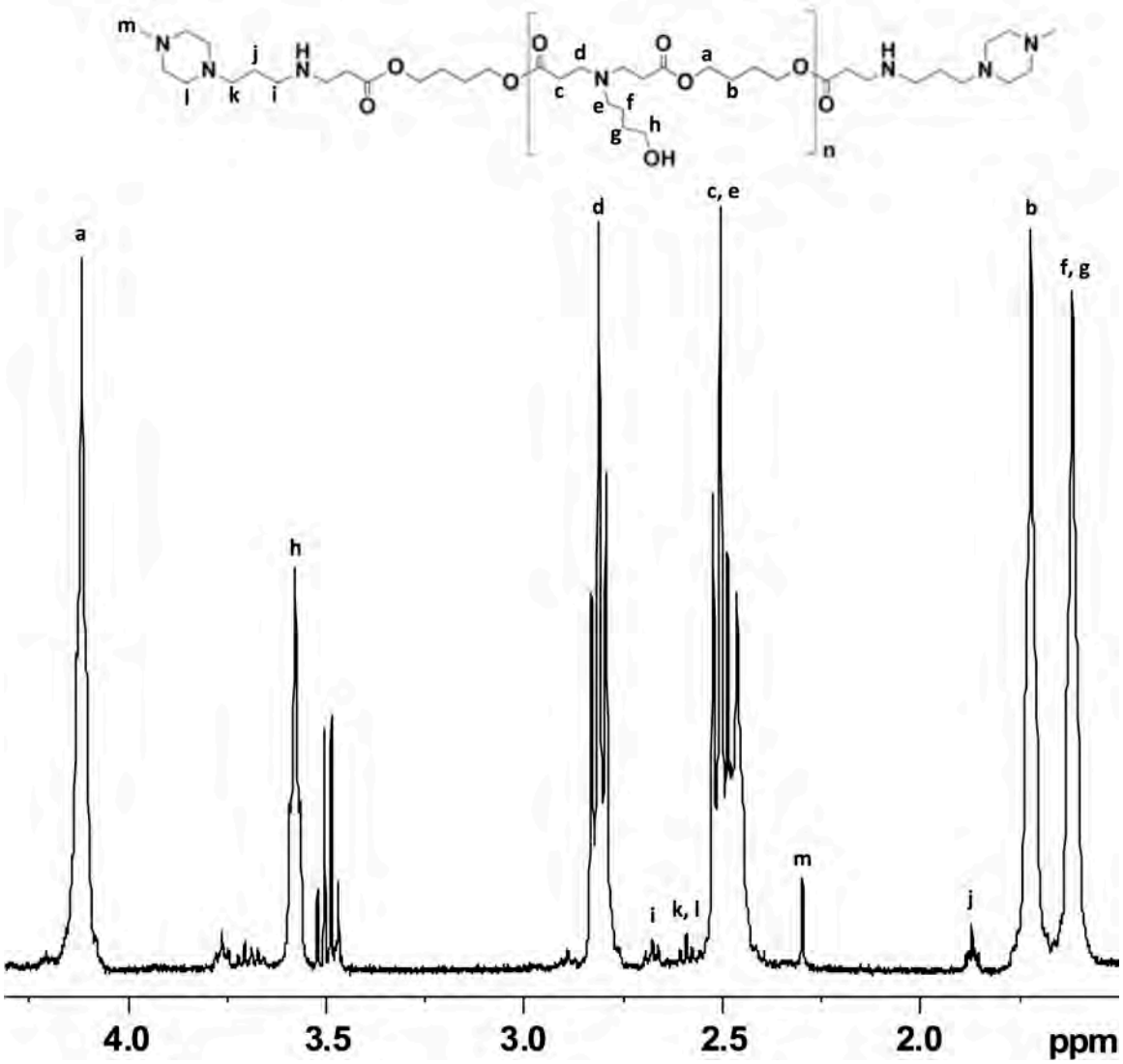

Figure S1. H^1-NMR spectrum of polymer 447 ($CDCl_3$, 400 Hz). Protons peaks are labeled with letters corresponding to protons along the structure of 447.

	9L Gliosarcoma		F98 Glioma	
	Lipo 0.6 μg	Lipo 0.3 μg	Lipo 0.6 μg	Lipo 0.3 μg
446 30 w/w	***	***	***	***
446 60 w/w	***	***	**	ns
446 90 w/w	***	***	ns	ns
447 30 w/w	***	***	***	***
447 60 w/w	ns	ns	***	***
447 90 w/w	**	ns	***	***
453 30 w/w	***	***	***	***
453 60 w/w	*	***	***	***
453 90 w/w	ns	***	ns	*
456 30 w/w	***	***	ns	ns
456 60 w/w	ns	*	***	***
456 90 w/w	ns	ns	***	***
457 30 w/w	***	***	***	***
457 60 w/w	ns	ns	***	***
457 90 w/w	ns	ns	***	***
536 30 w/w	***	***	ns	ns
536 60 w/w	ns	ns	***	***
536 90 w/w	*	ns	***	***
537 30 w/w	***	***	***	***
537 60 w/w	ns	ns	***	***
537 90 w/w	ns	ns	*	**

Table S2. Results of one-way ANOVA with Dunnett's post-test in 9L and F98 cells versus Lipofectamine® 2000 delivering either 0.6 or 0.3 μg GFP DNA per well. (ns = not significant, * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$)

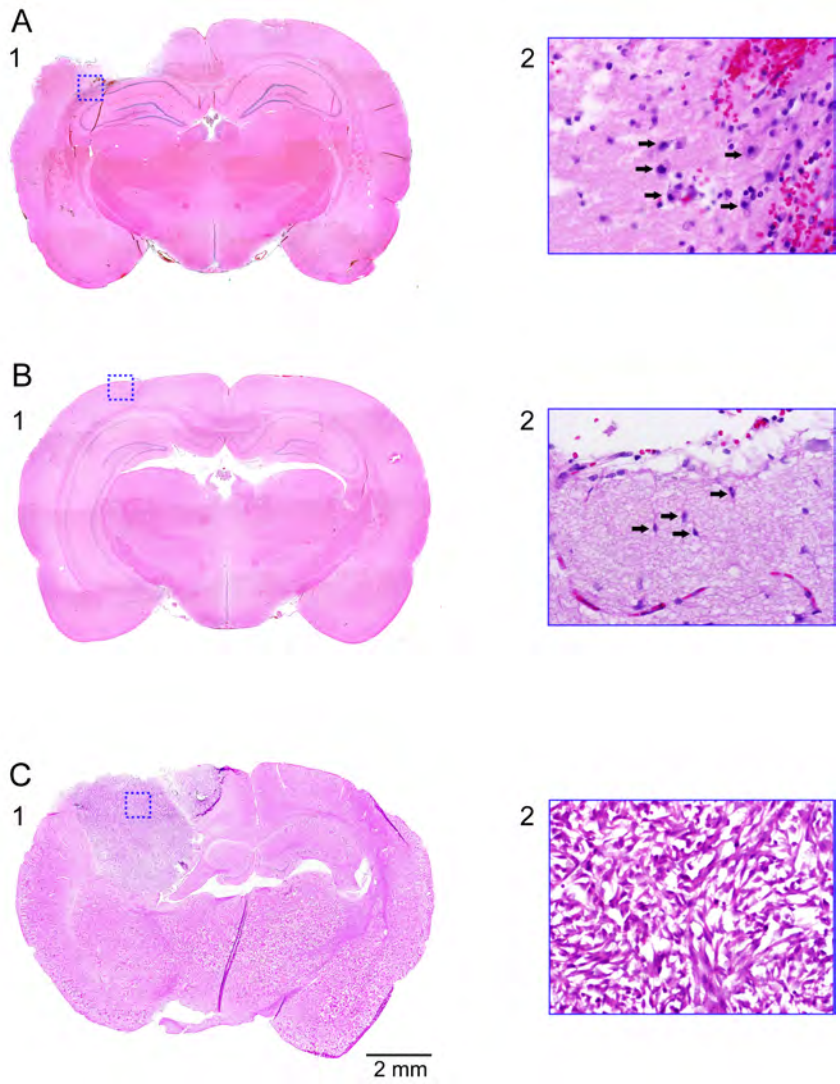

Figure S2. Safety of local brain delivery of PBAE nanoparticles.
Representative coronal sections of rat brains from wild type and 9L tumor-bearing animals infused with PBAE/GFP nanoparticles. The H&E images taken within 1 mm around the site of the infusion show no sign of neuropathological damage.
(**A1**) Wild type animal euthanized 3 days post-nanoparticle infusion. The image shows indentation into the cortex with inflammation, consistent with acute injury at the injection site. No sign of neurotoxicity. Under microscopic view: presence of neutrophils with a few macrophages within the injection site (black arrows) **(A2**).
(**B**) Wild type animal euthanized 60 days post-nanoparticle infusion. The figure shows a very small indentation with tissue shrinkage. Under microscopic view: astrocytes are present (black arrows), and the tissue shows no sign of inflammation **(B2).**
(**C**) 9L tumor-bearing animal euthanized 3 days post-PBAE/GFP nanoparticle infusion. The image shows a tumor mass causing contralateral brain midline shift and robust mass effect on the surrounding structures. There is a distinguishable sign of needle entrance within the tumor mass. Under microscopic view: characteristic cellular density of tumor tissue and no inflammation or tissue damage referable to any cause of damage other than tumor **(C2).**
(**A2,B2,C2,** X 600 magnification)

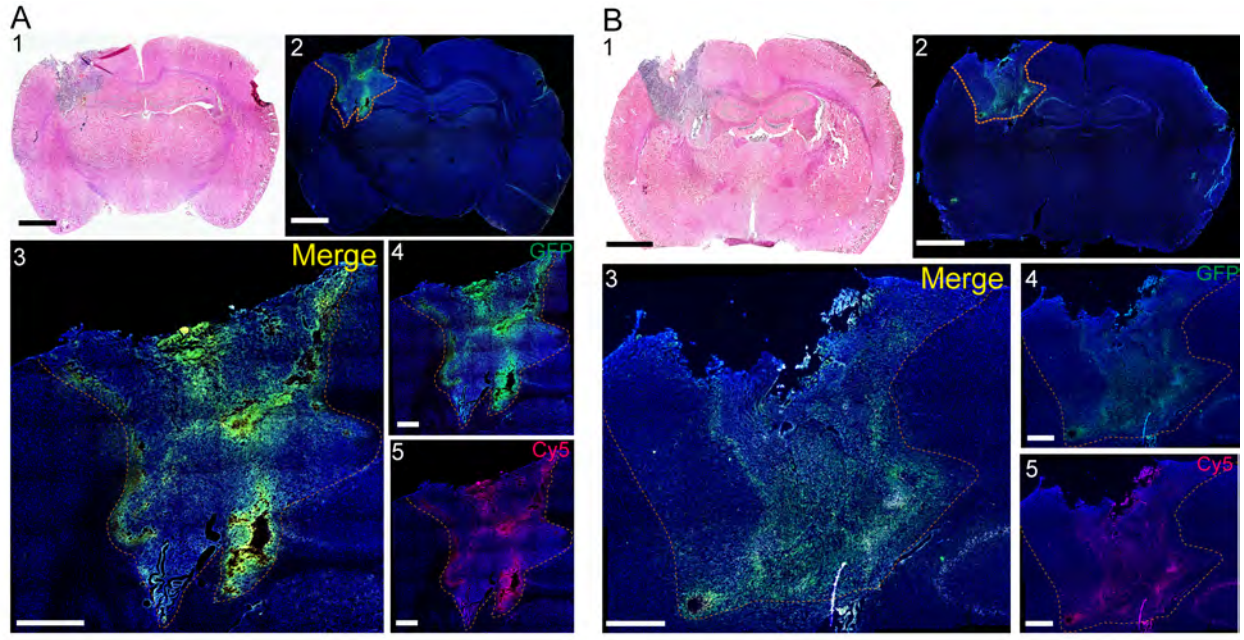

Figure S3. Convection-enhanced delivery of PBAE/GFP nanoparticles improves the level of intratumoral transfection. Coronal section of 9L-bearing rats infused via CED (**A**) and injected with bolus administration (**B**). Fluorescence microscopy of both brains show higher intratumoral transfection efficacy after CED infusion (**A2, B2**, scale bar=2mm). The images focused on the tumor area show a distribution of Cy5 and GFP signal that is favorable in CED compared to bolus (**A3-5**, **B3-5** scale bar=1 mm). Red: Cy5, green: GFP, blue: DAPI.