Electronic Supplementary Material (ESI) for RSC Advances.

SUPPLEMENTAL INFORMATION

Enhancing Intracranial Delivery of Clinically Relevant Non-viral Gene Vectors

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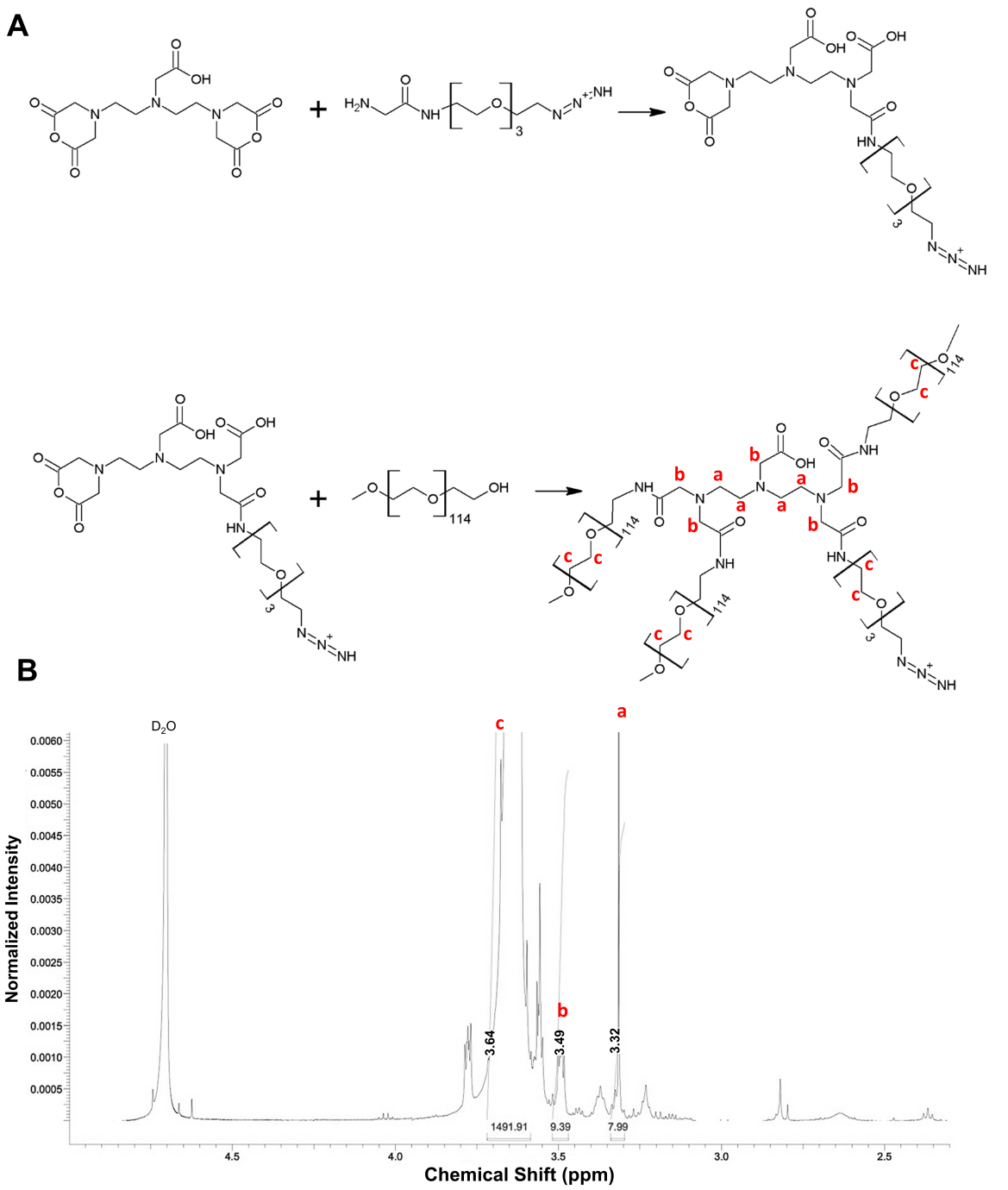

Figure S1: Synthesis of BrPEG. (A) Synthesis of azido-DTPA by reacting DTPA anhydride with 11-azido-3,6,9-trioxaundecanamine and subsequent PEGylation via amine-carboxyl coupling **(B)** ^{1}H-NMR spectra for BrPEG. Peaks a and b correspond to protons on DTPA and the peak c corresponds to PEG. Based on the NMR analysis, 3.27 5 kDa PEG chains on average are conjugated to each DTPA molecule.

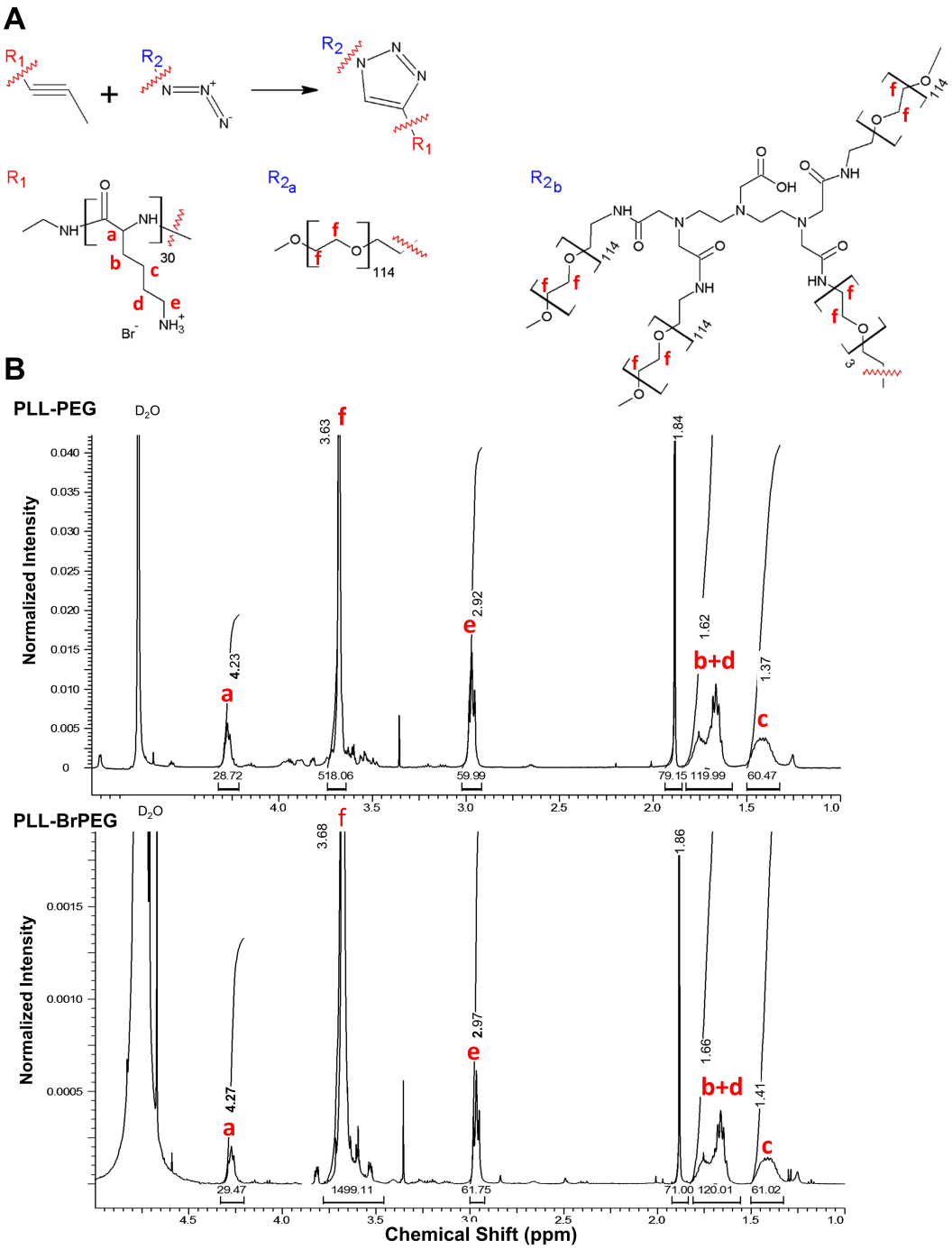

Figure S2: Synthesis of PLL-PEG and PLL-BrPEG. (A) Alkyene-azide cycloaddition click chemistry reaction for synthesis of PLL-PEG and PLL-BrPEG. R_1 represents PLL and R_2 represents linear 5 kDa PEG (R_{2a}) or branched 15 kDa PEG (R_{2b}) with chemical structures depicted below the reaction scheme. Red letters correspond to the NMR peaks of Fig. 1B **(B)** ^{1}H-NMR spectra for end products of the PEGylation reactions purified by chromatography and dialysis. Peaks a, b+d, c and e correspond to protons on lysine residues as noted in Fig. 1A, peak f corresponds to PEG and peak g corresponds to acetate counter-ions. The degrees of PEGylation were determined by quantitative analysis of NMR spectrograms. The area under curves of PEG peaks were normalized by those of PLL peaks, yielding approximately 3 times higher PEG to PLL ratio for PLL-BrPEG compared to PLL-PEG.

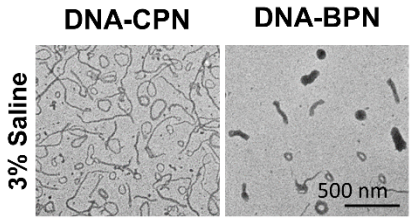

Figure S3: TEM images representative of DNA-CPN and DNA-BPN 1 hour post treatment with 3% saline; Scale bar: 500 nm.