Electronic Supplementary Material (ESI) for Polymer Chemistry

Biocompatible Polyethylenimine-graft-Dextran Catiomer for Highly Efficient Gene Delivery Assisted with Nuclear Targeting Ligand

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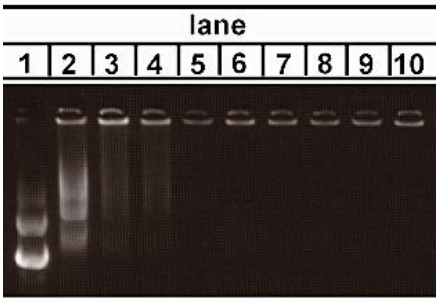

Fig. S1 Agarose gel electrophoresis retardation assay of the stability of PV7 in the simulative pH of cellular lysosomes. Lane 1: naked DNA; Lane 2-4: Dex-g-PEI_{1800}/pDNA complexes with weight ratios of 0.25:1, 0.5:1 and 0.75:1 without PV7 (PH=7); lane 5-7: Dex-g-PEI_{1800}/pDNA complexes with weight ratios of 0.25:1, 0.5:1 and 0.75:1 with PV7 (PH=7); lane 8-10: Dex-g-PEI_{1800}/pDNA complexes with weight ratios of 0.25:1, 0.5:1 and 0.75:1 with PV7 (PH=5).

Method: According to the agarose gel retardation assay of the DNA binding ability of Dextran-g-PEIs conjugates, Dextran-g-PEI_{1800} was not capable of completely condensing pDNA at vector/pDNA weight ratio < 1:1. Ternary complexes PV7/Dextran-g-PEI_{1800}/pDNA were prepared in the presence of PV7 amount applied during the gene transfection experiment at the weight ratio of Dextran-g-PEI_{1800}/pDNA from 0.25:1, 0.5:1 to 0.75:1. These ternary complexes were subject to incubation with pH 5.0 buffer for 30 min, with the group incubation with pH 7.0 buffer as the control experiment. The protocol was evaluated according to the agarose gel electrophoresis retardation assay shown in the experimental part.

Result: The successful incorporation of PV7 into the ternary complex has been shown by agarose gel retardation assay, where PV7 can successful assist the DNA binding at the ratio of Dextran-graft-PEI that could not efficiently condense DNA with the incomplete retardation of pDNA. And the result also show no obvious alterations on the fluorescence bands of Dextran-g-PEIs/pDNA complexes at pH 5.0 (lane 8-10) compared with the control experiment (lane 5-7), indicating the stable complex in such a harsh condition.

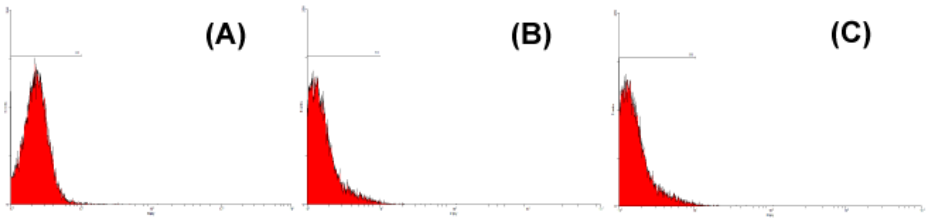

Fig. S2 Flow cytometry data of blank control for 293T (A), HeLa (B) and HepG2 (C)

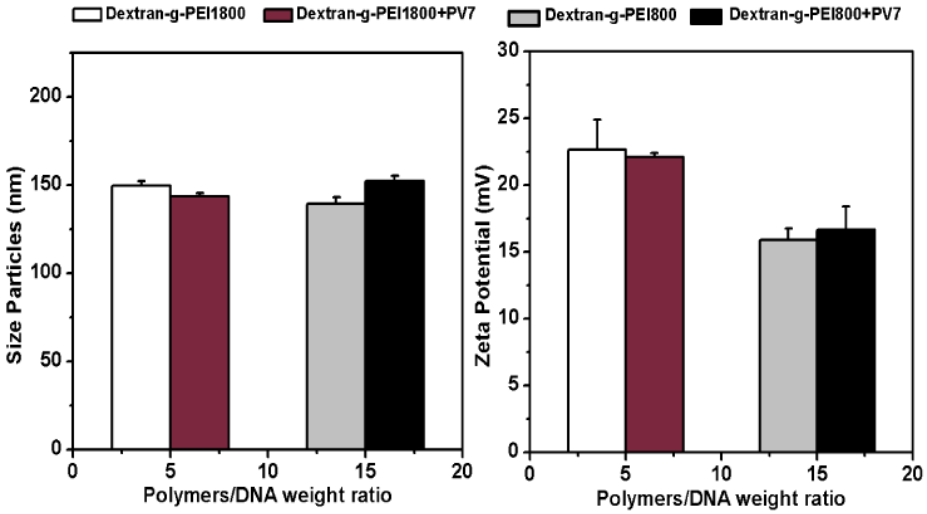

Fig. S3 Particle size and zeta potential were determined by DLS for PV7/Dex-g-PEI_{1800}/pEGFP complexes and PV7/Dex-g-PEI_{800}/pEGFP complexes

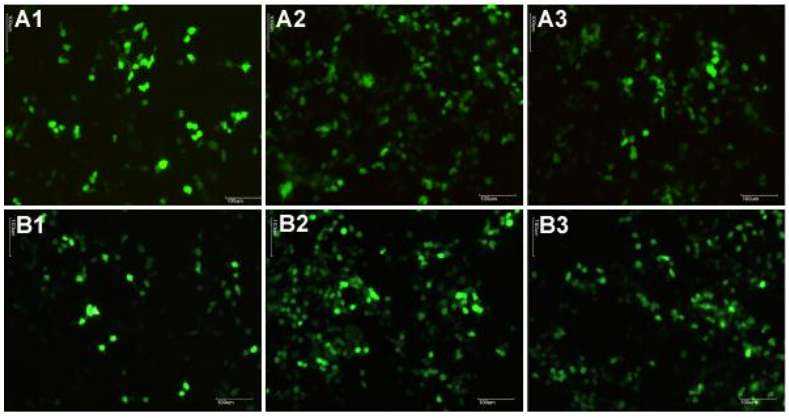

Fig. S4 GFP expression of Dex-g-PEI_{1800}/pEGFP and Dex-g-PEI_{800}/pEGFP in 293T cells at different weight ratios. A1, A2, A3 stand for Dex-g-PEI_{1800}/pEGFP 3:1, 5:1, 10:1 and B1, B2, B3 stand for Dex-g-PEI_{800}/pEGFP 10:1, 15:1, 20:1.