Supplemental Information for

A smart nanoassembly consisting of acid-labile vinyl ether PEG-DOPE and protamine for gene delivery: preparation and in vitro transfection

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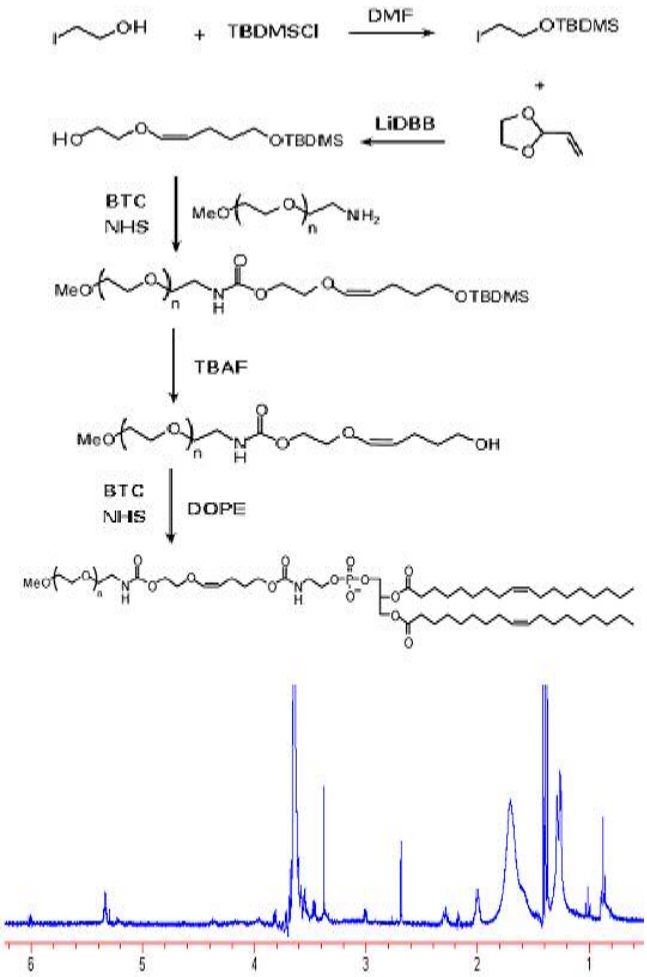

Figure S1 The synthesis scheme and characterization of PVD. The acid labile poly (ethylene glycol)-vinyl ether-dioleoylphosphatidyl ethanolamine (PVD) was synthesized according to Shin's method[14] with slight modification, and its structure was confirmed by ^{1}H NMR spectra. ^{1}H NMR ($CDCl_3$): δ 0.85

(t, 6H), 1.27 (m, 44H), 1.98 (m, 8H), 2.09 (q, 2H), 2.24 (m, 4H), 3.02 (m, 2H), 3.3–3.9 (m, ca. 500H), 5.20 (s, 1H), 5.36 (m, 4H) and 5.98 (d, 1H). TBDMSCl, tert-butyldimethylsily chloride; DMF, dimethylformamide; DBB, 4, 4'-di-tert.-butyl-biphenyl; BTC, bis (trichloromethyl) carbonate; NHS, N-hydroxysuccinimide; TBAF, tetrabutylammonium fluoride.

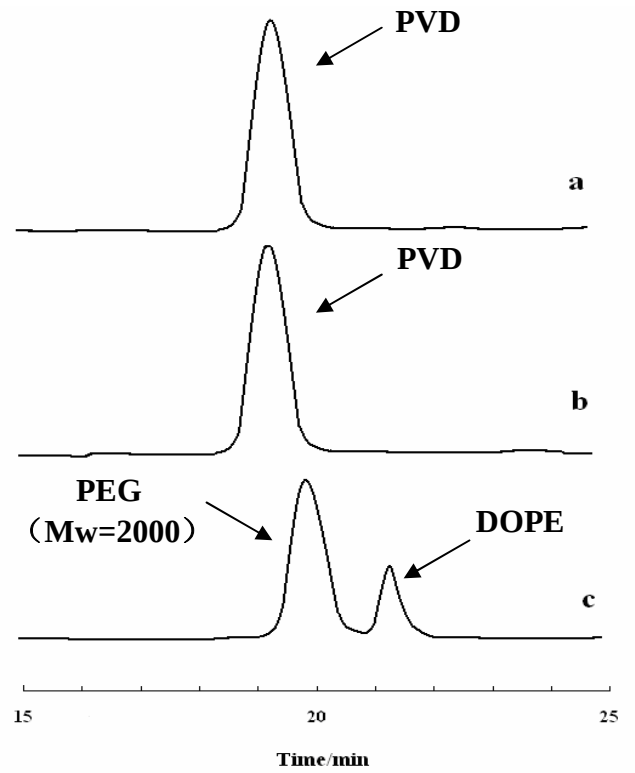

Figure S2 GPC diagrams of PVD before (a) and after incubation in solutions with pH 7.4 (b) and pH 4.5 (c) for 2 hour.

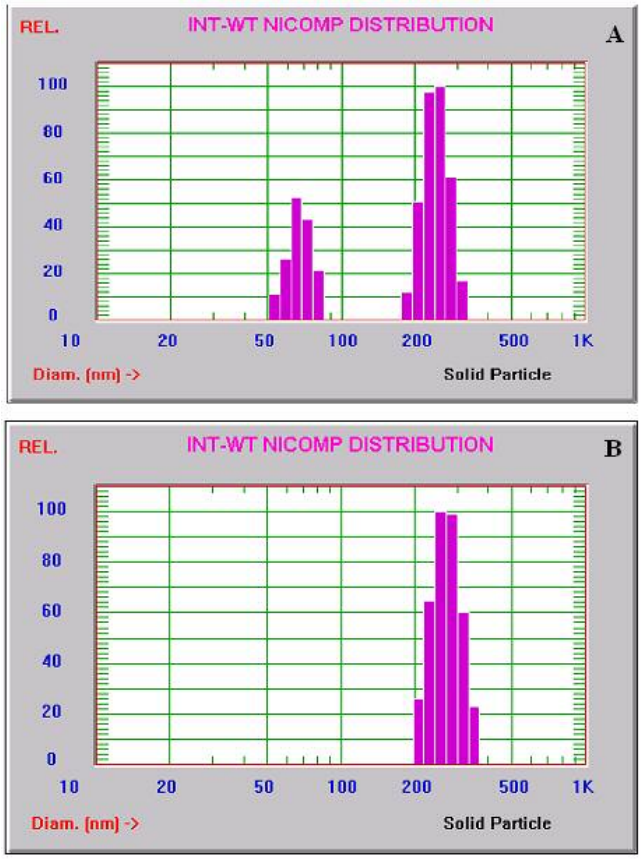

Figure S3 Size distribution of SNAs2 before purification (A) and after purification (B)

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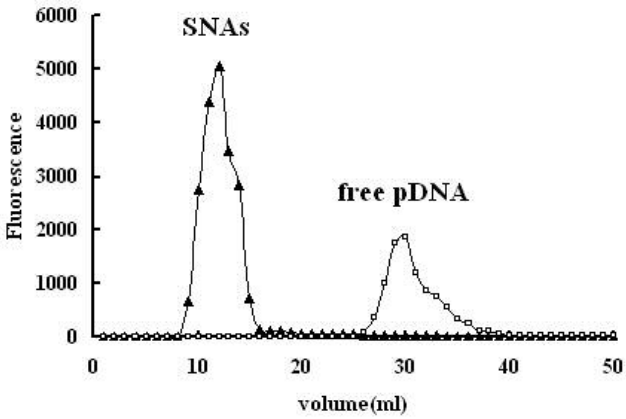

Figure S4 Elution curve of SNAs. The amount of the extracted DNA (▲) and free DNA (□) were calculated from the fluorescence by PicoGreen® reagent using a linear calibration curve of the relevant complexed DNA in the presence of heparin (0.1%, w/v).

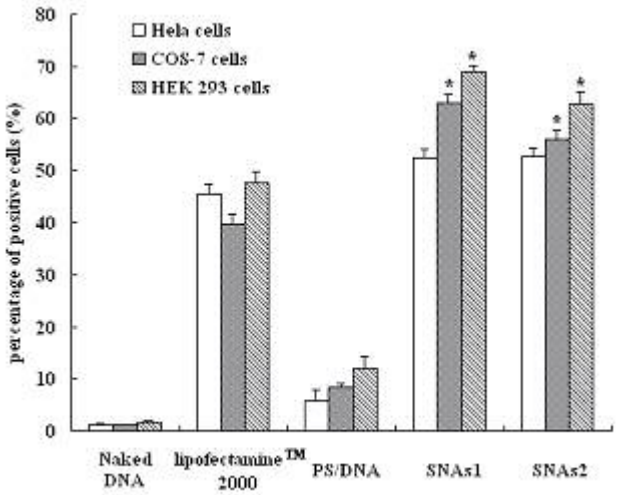

Figure S5 Transfection efficiency of SNAs loading PS/DNA in different cell lines (n = 3). Data were given as mean ± SD. *$p<0.05$ compared with lipofectamine™ 2000 group.