SUPPORTING INFORMATION

Novel amphiphilic block-copolymer forming stable micelles and interpolyelectrolyte complexes with DNA for efficient gene delivery

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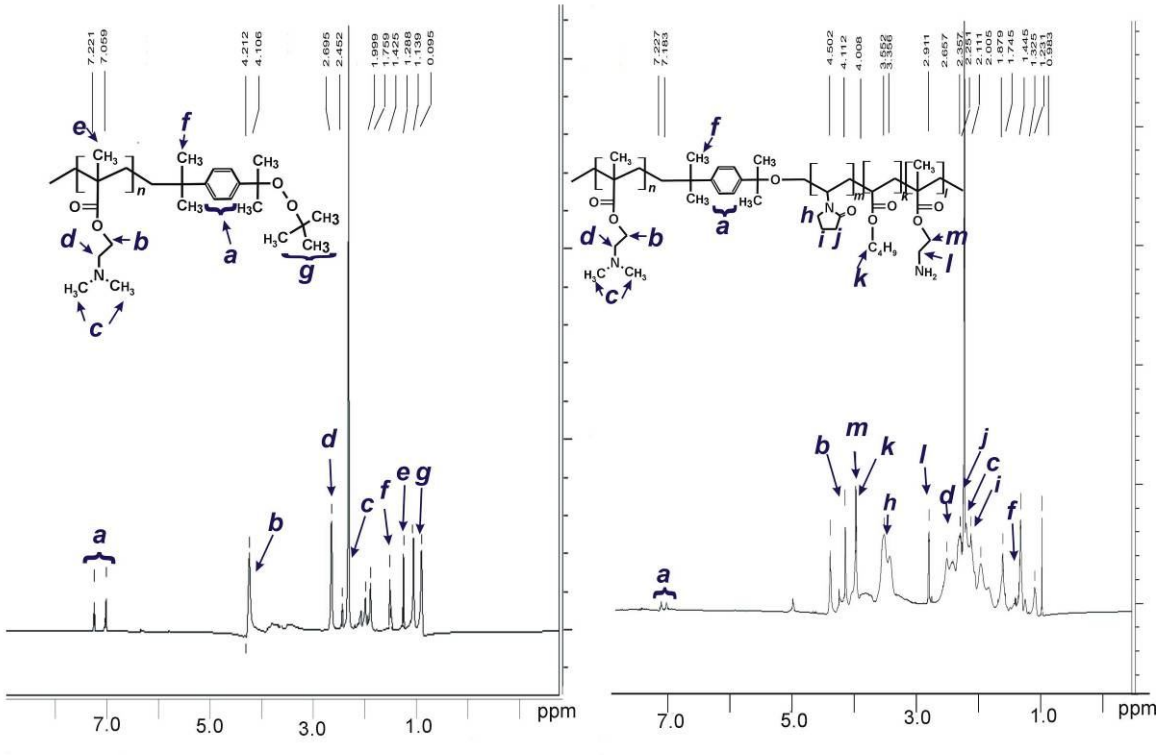

FIGURE S1. ^{1}H NMR spectra of pDMAEMA-MP (left) and pDMAEMA-*block*-poly(NVP-*co*-BA-*co*-AEM) (right).

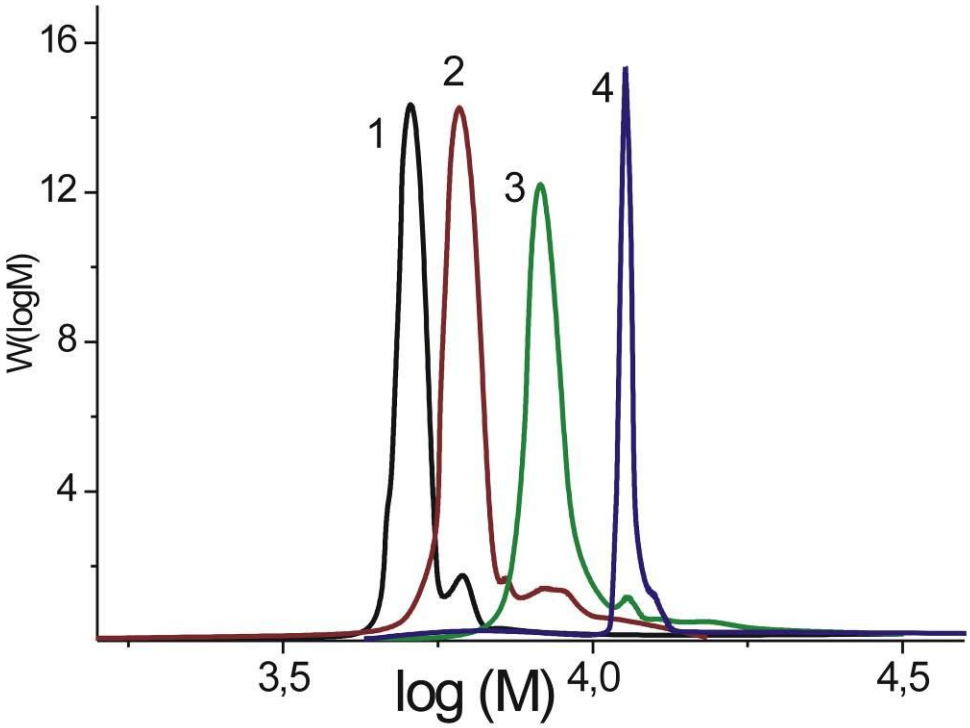

FIGURE S2. Molecular weight distribution of polymers pDMAEMA-MP (1) and pDMAEMA-*block*-poly(NVP-*co*-BA-*c*o-AEM)(2-4) : BP81-1(2); BP82-1(3); BP83-1(4);.

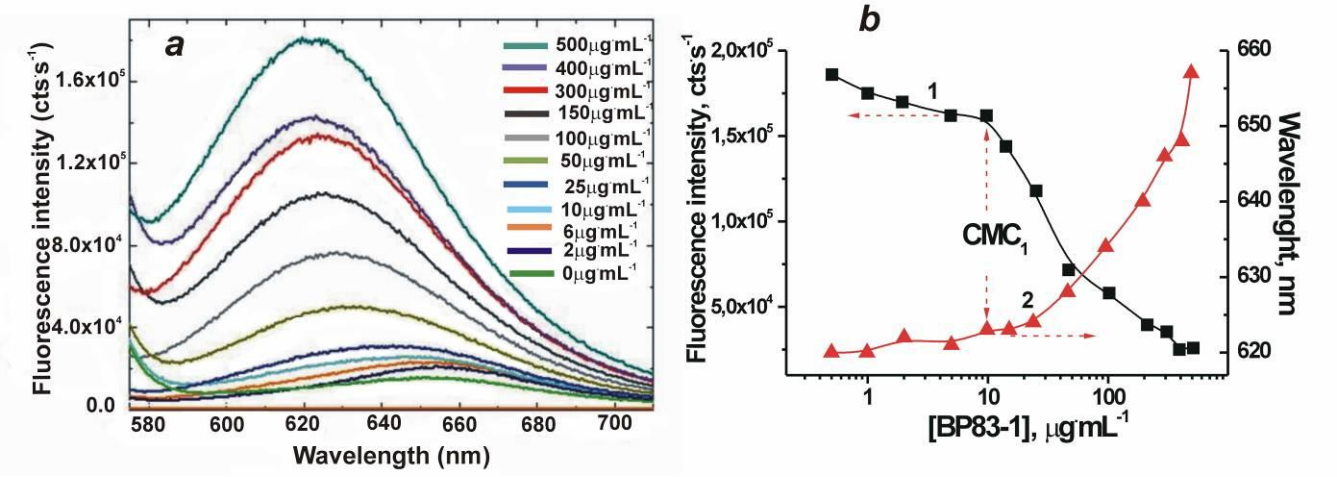

FIGURE S3. Fluorescence emission spectra of Nile Red at different concentrations of the block copolymer BP83-1 (a) and the results of determination of the CMC_1 value of the BP83-1: fluorescence intensity (1) and emission wavelength maximum (2) at increasing concentrations of the BP83-1 (0–500 $\mu g \cdot mL^{-1}$) (b).

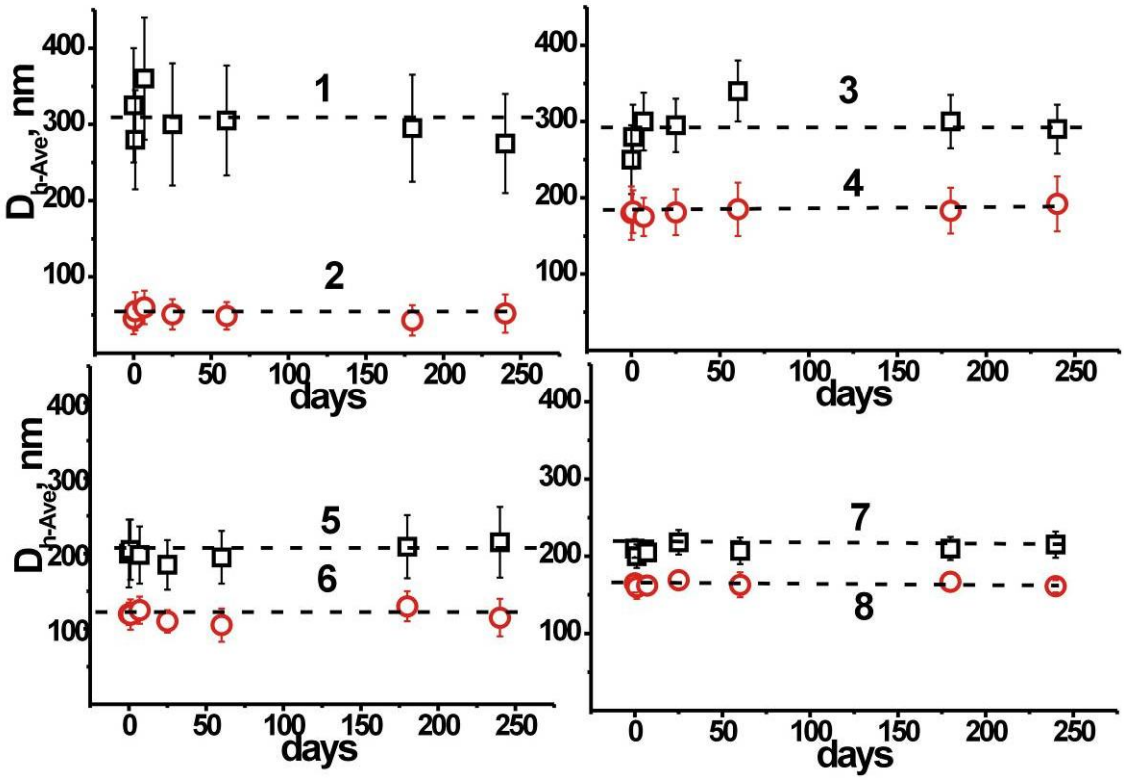

FIGURE S4. Dependence of the hydrodynamic diameter of micelles formed by the poly(DMAEMA)-MP (1,2), BP 83-1 (5,6)) and polyplexes poly(DMAEMA)-MP/DNA (3,4) and BP 83-1/DNA (7,8)) on time. [pDMAEMA-MP]=1,000 μg·mL^{-1}(1); 10,000 μg·mL^{-1} (2) and [BP 83-1]=400 μg·mL^{-1}(5); 1,000 μg·mL^{-1} (6); [pDMAEMA-MP/DNA]=100/1,000 μg·mL^{-1}(3); 1,000/1,000 μg·mL^{-1}(4) and [BP 83-1/DNA]=100/1,000 μg·mL^{-1}(7); 1,000/1,000 μg·mL^{-1} (8).

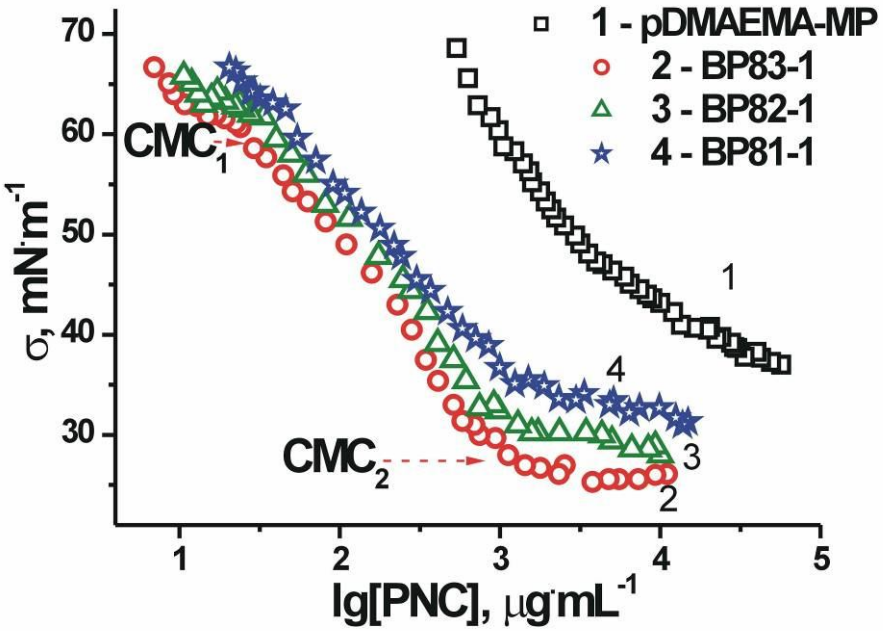

FIGURE S5. Surface tension isotherms of the solutions of pDMAEMA-MP (1) and poly(DMAEMA)-*block*-poly(NVP-*co*-BA-*co*-AEM) with molecular weight of copolymer blocks: 2 – M_n=11 kDa (BP83-1); 3 – M_n=8.2 kDa (BP82-1); 4 – M_n=6.7 kDa (BP81-1).

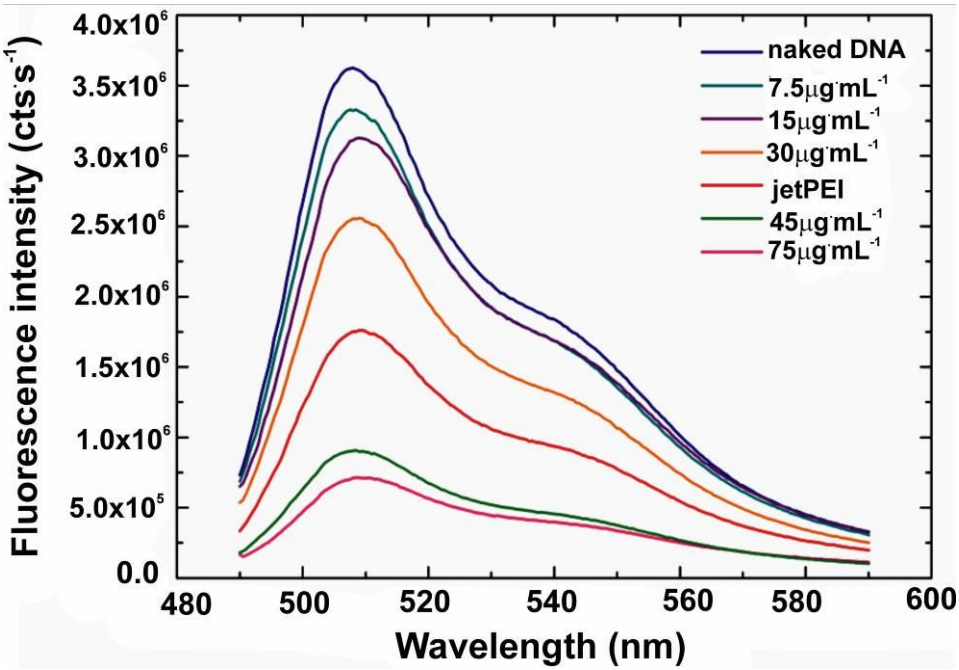

FIGURE S6. Fluorescence emission spectra of YOYO-1 labeled DNA complexed with BP83-1. BP83-1/DNA complexes were formed at BP83-1 concentrations in between 7.5 μg·mL^{-1} –75 μg·mL^{-1} and 1 mg of DNA in 20 mM MES buffer at pH 7.0. JetPEI/DNA complex was formed with 1 mg of DNA as a control. Free YOYO-1-labeled DNA is marked as 1. The molar ratio of DNA and YOYO-1 was 50:1. The excitation wavelength was 480 nm.

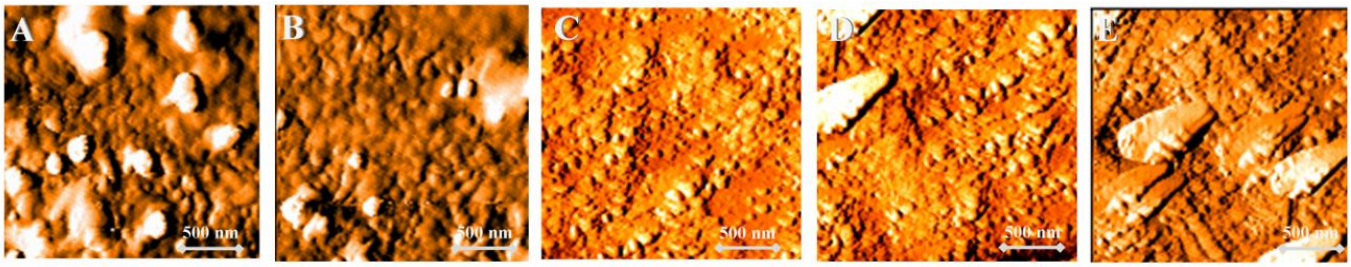

FIGURE S7. AFM images of the BP83-1/DNA complexes that were formed by the BP83-1 at its increasing concentrations 7.5 μg·mL^{-1} (A), 15 μg·mL^{-1} (B), 30 μg·mL^{-1} (C), 45 μg·mL^{-1} (D) and 75 μg·mL^{-1} (E).

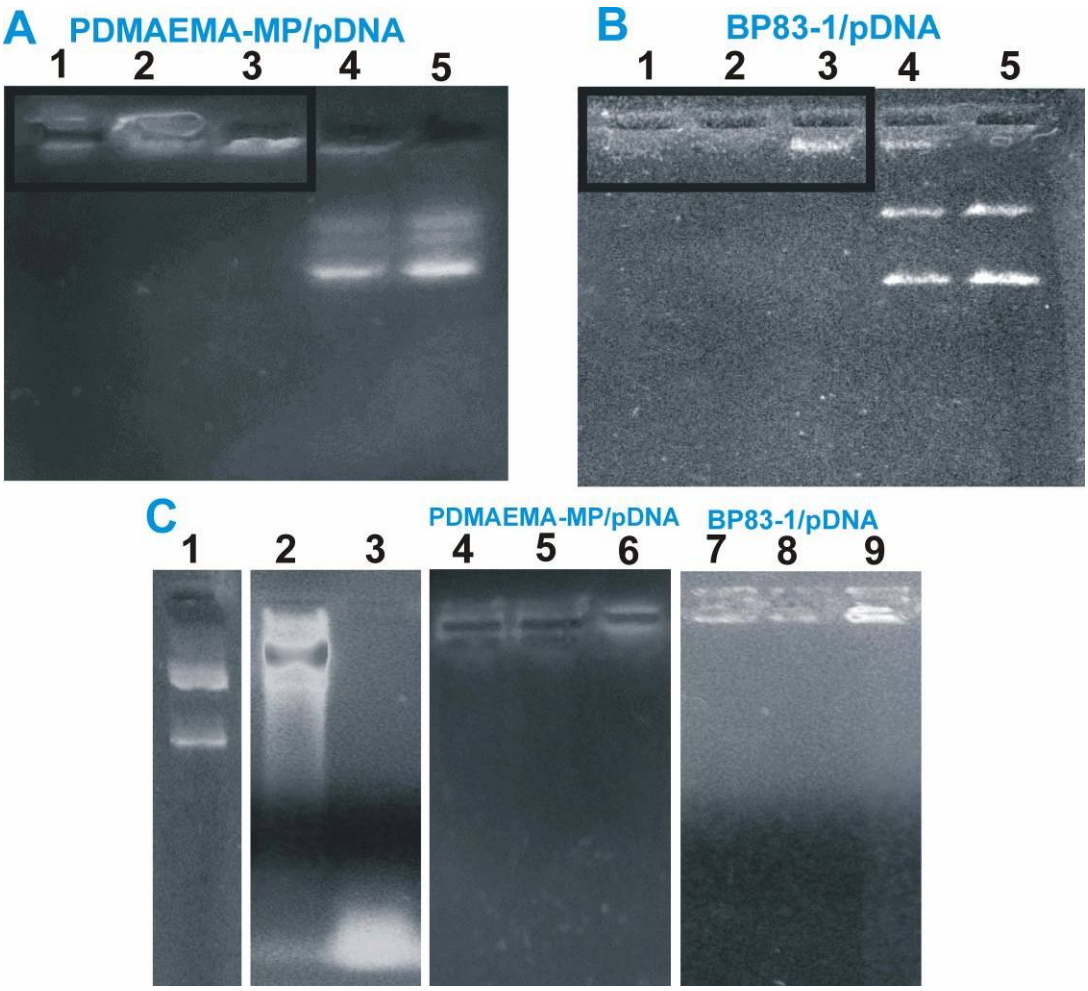

FIGURE S8. Results of gel retardation assay of the PNC (PDMAEMA-MP (A) or BP83-1(B)) and plasmid pEGFP c-1 complexes at electrophoresis in 1% agarose gel. Lines 1 – 10 mg·mL^{-1} + pDNA; 2 – 1 mg·mL^{-1} + pDNA; 3 – 100 μg·mL^{-1} + pDNA; 4 – 10 μg·mL-1 + pDNA; 5 – intact pDNA (black border indicates the complex of PNC/pDNA) (A, B); as well as complex of plasmid DNA with PNC (PDMAEMA-MP (lines 4-6) or BP83-1 (lines 7-9)) (100 μg·mL^{-1}) was treated for 3.5 h with the DNase I in different concentrations: lane 1 – pDNA; 2 – pDNA incubated with DNase I at 0.05 U·μg^{-1} DNA; 3 – pDNA incubated with DNase I at 0.5 U·μg^{-1} DNA; 4,7 – PNC/pDNA complex incubated with DNase I at 0.05 U μg^{-1} DNA; 5,8 – PNC/pDNA complex incubated with the DNase I at 0.5 U·μg^{-1} DNA; 6,9 – PNC/pDNA complex (C).

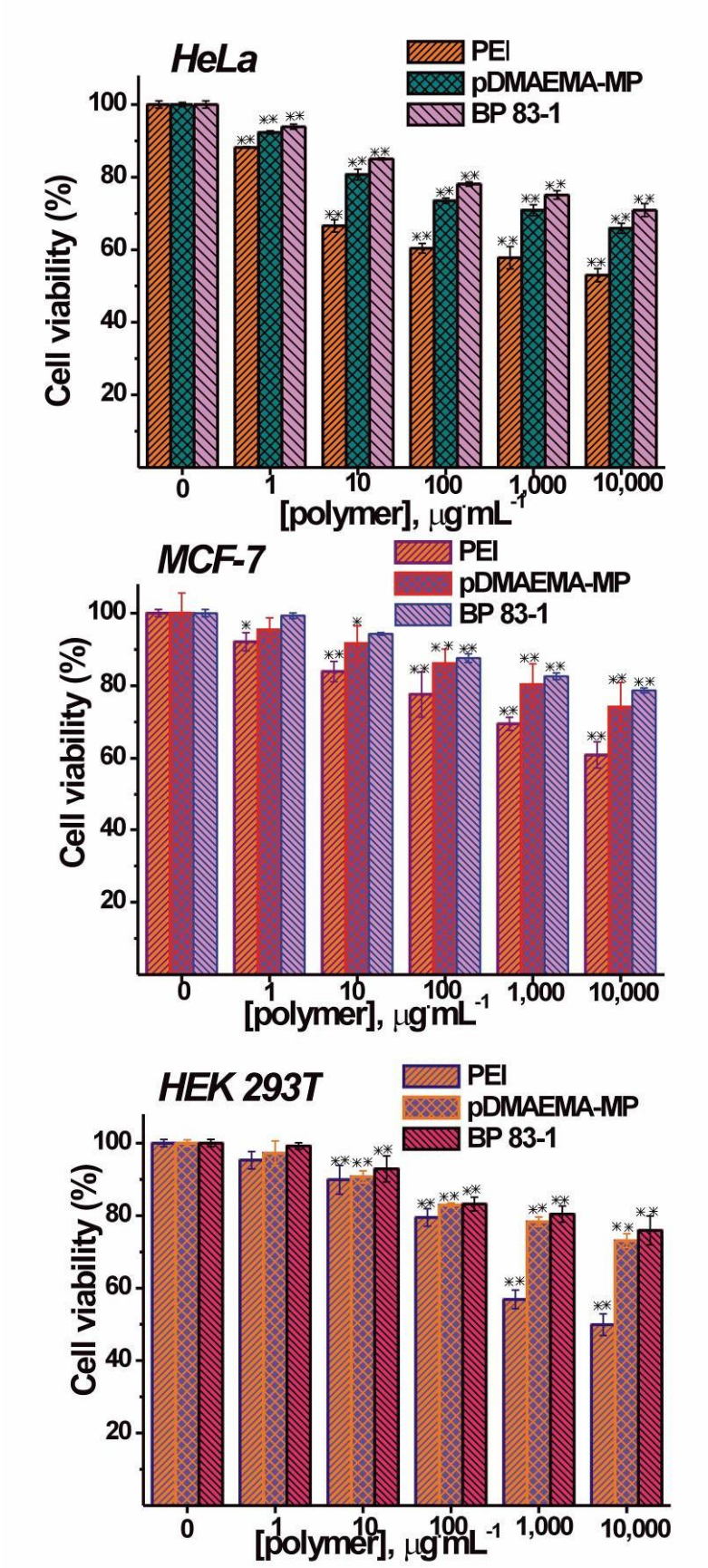

FIGURE S9. Cytotoxicity of PEI and PNC (PDMAEMA-MP and BP83-1) towards *HeLa, MCF-7* and *HEK293T* cells. The cytotoxicity of carriers was evaluated by the MTT assay. * – P≤ 0.05; ** – P≤ 0.01; *** – P ≤ 0.001 (difference compared with the non-treated cells).

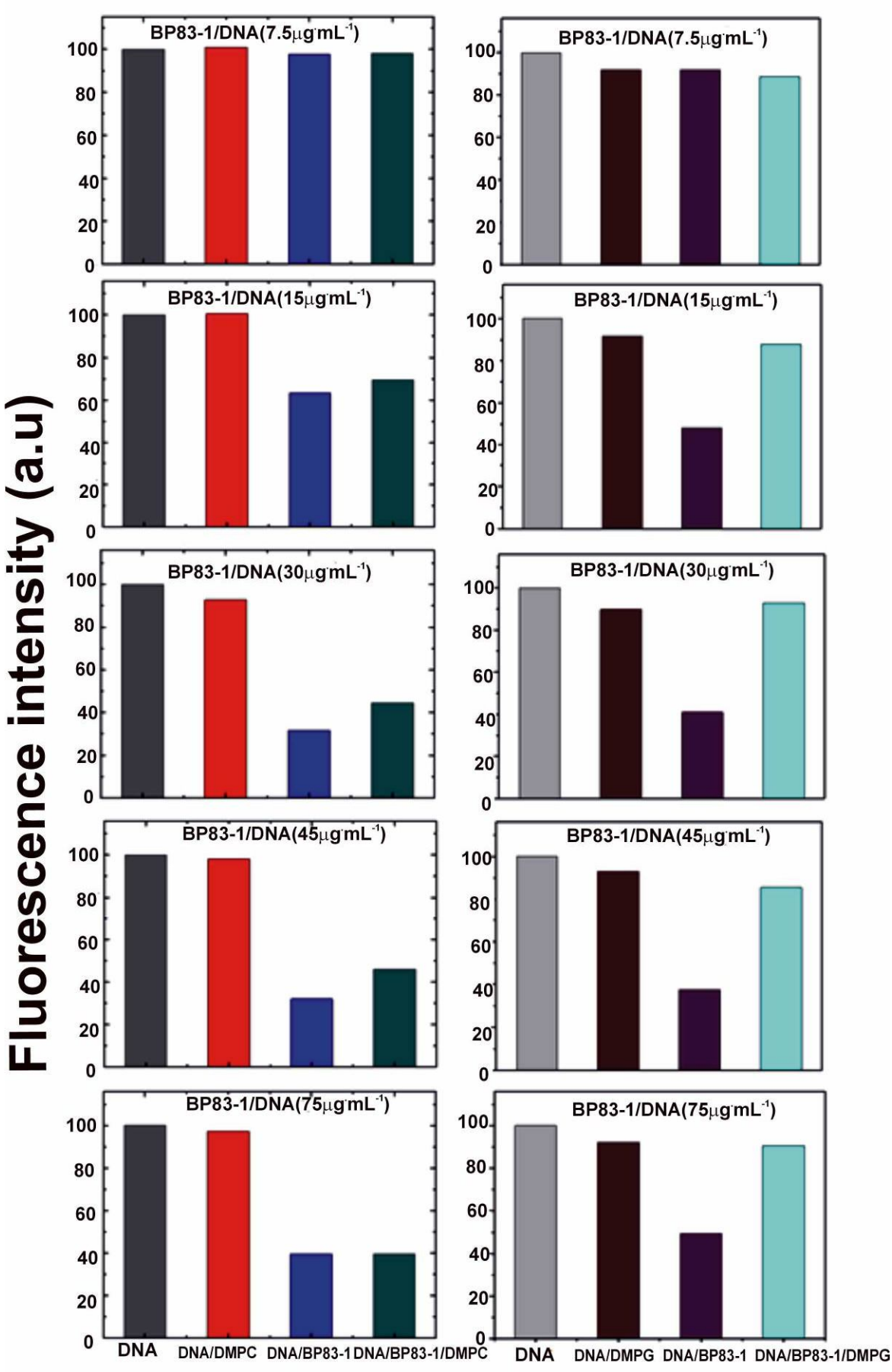

FIGURE S10. Interaction of the BP83-1/DNA complexes with DMPC (*left*) and DMPG (*right*) model lipid vesicles.