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Molecular weight of polyanion affects the biological activity of interpolycomplexes

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A. Poly(diallyldimethylammonium chloride) (PDADMAC) with an average molecular mass Mw = 470 kDa (CPS Chem. Com. Inc.) was used as a cationic polymer; two sodium polyacrylate samples with Mw = 8 (PANa1) and 250 kDa (PANa2) (Sigma-Aldrich) were used as a anionic polymers. PDADMAC was dissolved in 10^{-3} M Tris buffer solution with pH 7 additionally containing 10^{-2} M NaCl and mixed with a sodium polyacrylate (PANa) solution in the same buffer. The mixing resulted in an electrostatic PDADMAC-to-PANa complexation and formation of IPECs, stabilized by ionic bonds between oppositely charged groups of PDADMAC and PANa.[S1,S2] The salt solution provided an equilibrium distribution of PANa chains between PDADMAC chains as described earlier.[S3] Concentrations of polymers were expressed in moles of quaternary amino PDADMAC groups [N^+] and carboxylic PANa groups [COO^-] per liter.

B. The hydrodynamic diameter of the particles was measured using dynamic light scattering at a fixed scattering angle (90°) in a thermostatic cell (22 °C) with a ZetaPlus instrument (Brookhaven, USA), their electrophoretic mobility (EPM) using laser microelectrophoresis with a ZetaPlus instrument (Brookhaven, USA). The results were processed using software provided by the manufacturer. All experiments were performed with 5-7 repetitions. Statistical data processing was carried out with the Excel program.

C. Anionic palmitoyloleoylphosphatidylserine ($POPS^{1-}$) and zwitterionic dioleoylphosphatidylcholine (DOPC) (Avanti, USA, Houston, TX) were used as received. Liposomes were prepared by sonication with a standard protocol.[S4] The required amount of lipids was dissolved in chloroform; the organic solvent was removed under vacuum with Laborota-4000 (Heidolph, Germany)) at 30 °C. The lipid film was dispersed by vortex in a buffer solution. The resulting dispersion was treated with ultrasound using an ultrasonic homogenizer (Drawell JY92-

IIN, China). The resulting liposomes were purified from titanium dust by centrifugation for 5 minutes at 11,000 rpm. Molar ratio of lipids [$POPS^{1-}$]/[DOPC] in liposomes was 20/80. The average liposome diameter was of 85±5 нм, electrophoretic mobility was of -3.75± 0.1 (μm/s)/(V/cm).

D. Minimum inhibitory concentrations (MIC) for polymer formulations were determined towards gram-negative bacteria *Pseudomonas aeruginosa* 4.8.1 using the standard procedure.[S5] Briefly, an aqueous polymer solution was added to glass test-tubes with M9 medium – an aqueous solution, which contained a mixture of glucose and inorganic salts with a total salt concentration of about 0.08 M; the polymer concentration ranged from 0 to 2 wt%. Then, the tubes were inoculated with the bacteria *P. aeruginosa* and placed on a shaker at 28 °C; 2 days after, the growth of microorganisms was assessed. The lowest polymer concentration, at which no growth of the test cultures was observed visually, was taken as MIC.

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