Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information

Biodegradable containers composed of anionic liposomes and cationic polypeptide vesicles

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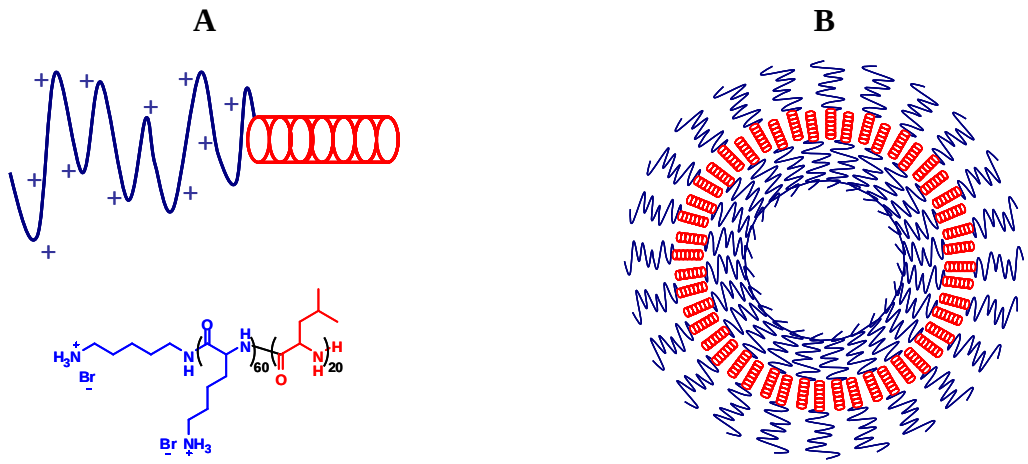

Figure S1. Block copolypeptide for cationic vesicle preparation (A) and schematic presentation of $K_{60}L_{20}$ self-assembly into vesicles (B).

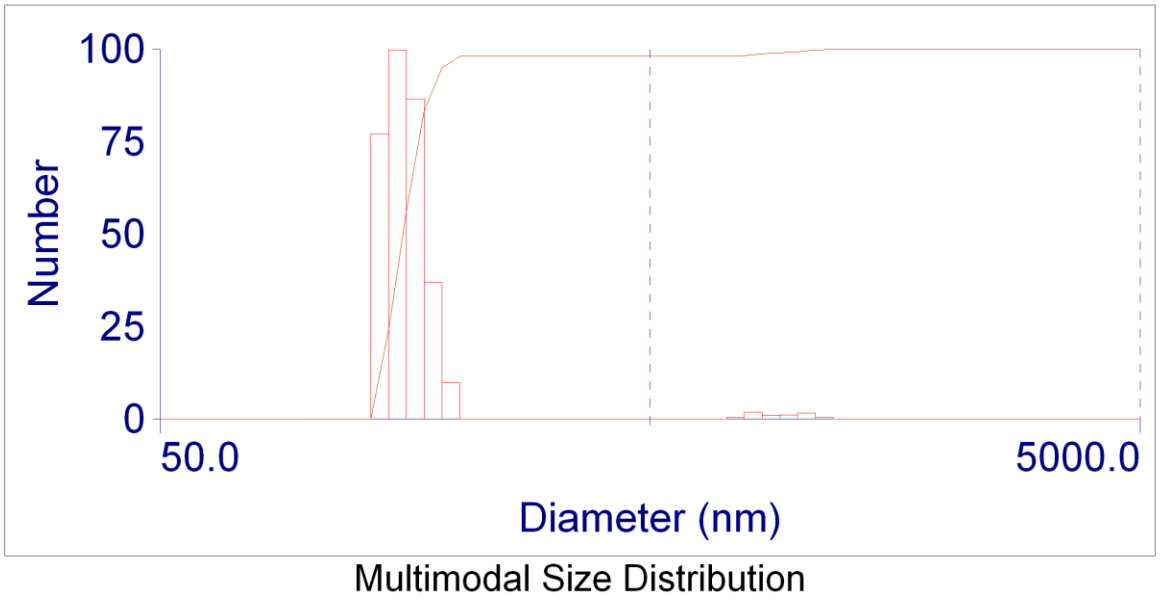

Figure S2. Distribution of CPV particles by size obtained with use of dynamic light scattering. Copolymer concentration 0.05 mg/mL; $[Lys+]_{outer} = 1\times10^{-4}$ M; 10^{-3} M TRIS buffer, pH 7.

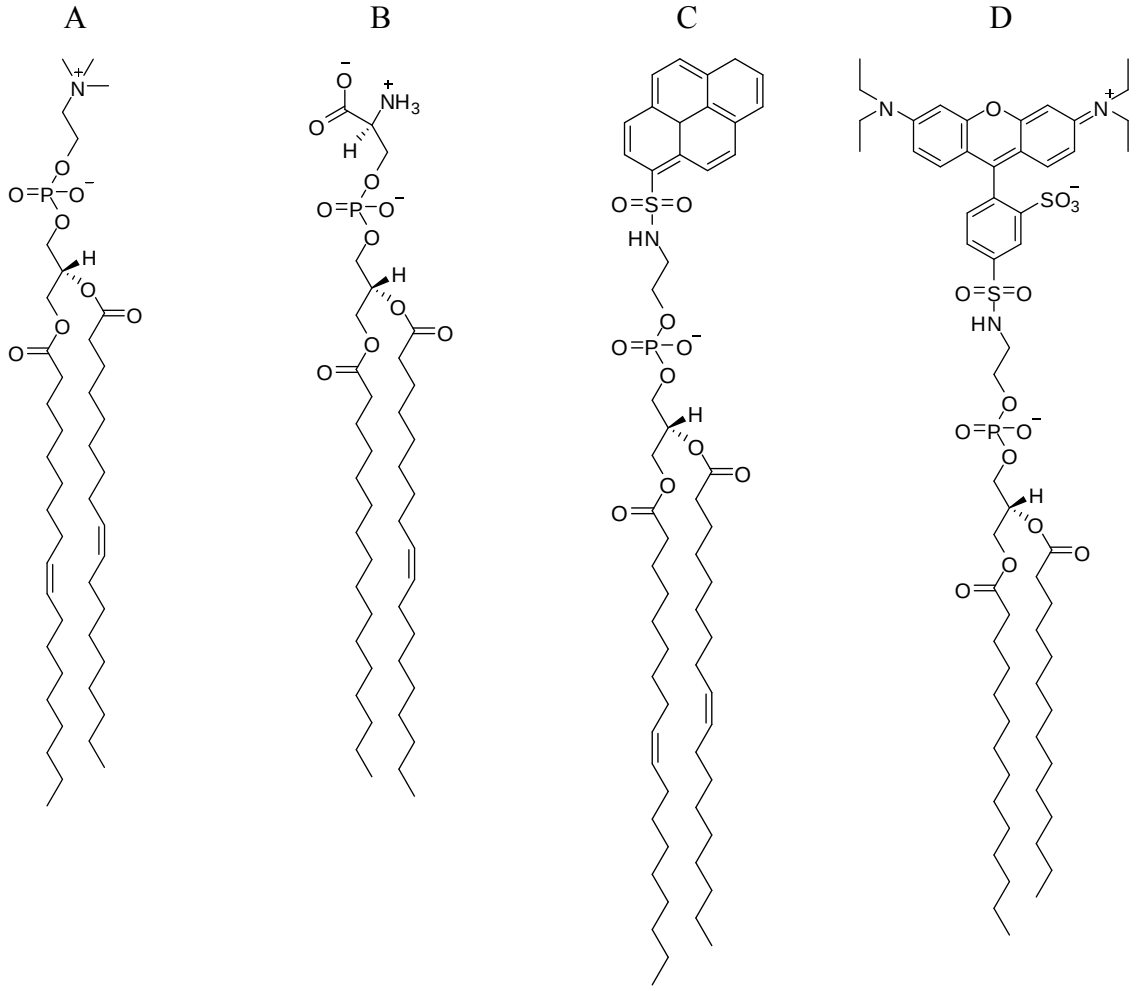

Figure S3. Lipids (schematical presentation): 1,2-dioleoyl-sn-glycero-3-phosphocholine, DOPC (A), 1-palmitoyl-2-oleoyl-sn-glycero-3-phospho-L-serine, $POPS^{1-}$ (B), 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine-N-(1-pyrenesulfonyl), pyrene-PE (C), 1,2-dimyristoyl-sn-glycero-3-phosphoethanolamine-N-(lissamine rhodamine B sulfonyl), Rh-PE (D).

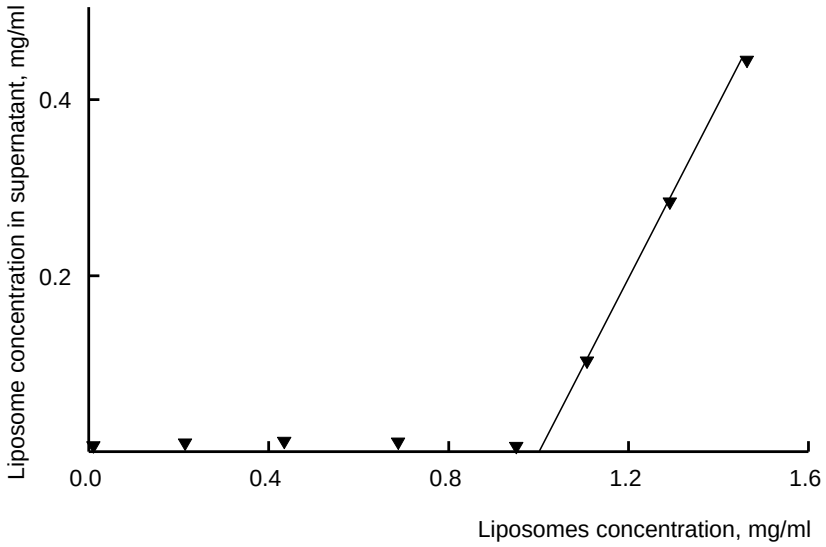

Figure S4. Fluorescence intensity in supernatants after separation of liposome/CPV complex vs. ν=0.1 DOPC/POPS^{1-} liposome concentration. Copolymer concentration 0.05 mg/mL; $[Lys^{+}]_{outer} = 1\times10^{-4}$ M; 10^{-3} M TRIS buffer, pH 7.

(S1) Liposome preparation

Small unilamellar anionic liposomes were prepared by the standard sonication procedure: appropriate amounts of DOPC and $POPS^{1-}$ solutions in methanol were mixed in a flask, after which the solvent was evaporated under vacuum. A thin lipid film was dispersed in a TRIS buffer (pH 7.0, 10^{-3} M) for 600s with a 4700 Cole-Parmer ultrasonic homogenizer. Liposome samples were separated from titanium dust by centrifugation for 5 min at 10,000 rpm and used within one day. Liposomes with a molar fraction of anionic $POPS^{1-}$ head-groups $\nu = 0.1$ were thus obtained. According to the DLS measurements, the size of liposomes varied from sample to sample but always retained within 40-60 nm interval.

Liposomes with a fluorescent dye incorporated into the membrane, were prepared by the same procedure, except 0.05 wt.% of pyrene-PE or Rh-PE was added to the lipid mixture solution before methanol evaporation. The fluorescence intensity of the labeled liposome suspensions was detected with a F-4000 Hitachi fluorescence at $\lambda em = 379$ nm ($\lambda ex = 347$ nm) for pyrene-labeled liposomes and at $\lambda em = 571$ nm ($\lambda ex = 557$ nm) for rhodamine-labeled liposomes.

Liposomes loaded with a NaCl solution were prepared by suspending and sonicating DOPC/$POPS^{1-}$ lipid film in a 10^{-3} M TRIS buffer solution additionally contained 1M NaCl. The liposome suspension was separated from the excess of external NaCl by dialysis against 10^{-3} M TRIS buffer.