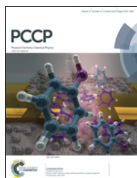


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The effect of an oligonucleotide on the structure of cationic DODAB vesicles

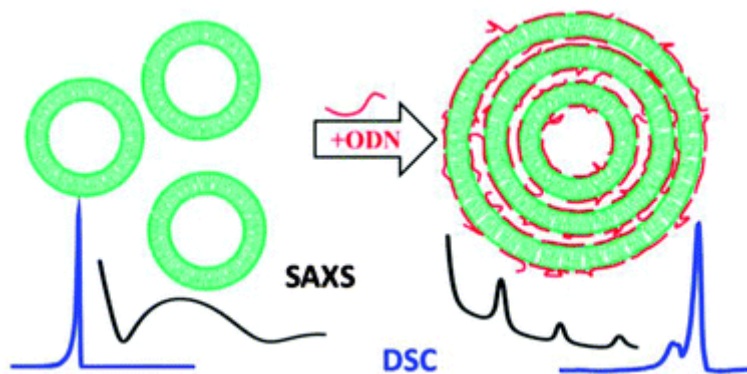


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Abstract

The effect of a small single-stranded oligonucleotide (ODN) on the structure of cationic DODAB vesicles was investigated by means of differential scanning calorimetry (DSC), small angle X-ray scattering (SAXS) and electron spin resonance (ESR) spectroscopy. ODN adsorption induced coalescence of vesicles and formation of multilamellar structures with close contact between lamellae. It also increased the phase transition temperature by 10 °C but decreased transition cooperativity. The ODN rigidified and stabilized the gel phase. In the fluid phase, a simultaneous decrease of ordering close to the bilayer surface and increase in bilayer core rigidity was observed in the presence of the ODN. These effects may be due not only to electrostatic shielding of DODAB head groups but also to superficial dehydration of the bilayers. The data suggest that oligonucleotides may induce the formation of a multilamellar poorly hydrated coagel-like phase below phase transition. These effects should be taken into account when planning ODN delivery employing cationic bilayer carriers.

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<https://doi.org/10.1039/C4CP05652C>

Article type

Paper

Submitted

04 Dec 2014

Accepted

12 Feb 2015

First published

12 Feb 2015

Citation*Phys. Chem. Chem. Phys.*, 2015, **17**, 7498-7506

BibTex



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