Modifying internal organization and surface morphology of siRNA lipoplexes by sodium alginate addition for efficient siRNA delivery

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Vectorized small interfering RNAs (siRNAs) are widely used to induce specific mRNA degradation in the intracellular compartment of eukaryotic cells. Recently, we developed efficient cationic lipid-based siRNA vectors (siRNA lipoplexes or siLex) containing sodium alginate (Nalg-siLex) with superior efficiency and stability properties than siLex. In this study, we assessed the physicochemical and some biological properties of Nalg-siLex compared to siLex. While no significant differences in size, ? potential and siRNA compaction were detected, the addition of sodium alginate modified the particle morphology, producing smoother and heterogeneous particles characterized by transmission electron microscopy. We also noted that Nalg-siLex have surface differences observed by X-ray photoelectron spectroscopy. These differences could arise from an internal reorganization of components induced by the addition of sodium alginate, that is indicated by Small-Angle X-ray Scatteri