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Biodegradable capsules as non-viral vectors for *in vitro* delivery of PEI/siRNA polyplexes for efficient gene silencing

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ABSTRACT

The efficiency of siRNA delivery is demonstrated to be improved by encapsulating the siRNA within a non-viral carrier based on layer-by-layer assembly of oppositely charged biodegradable and biocompatible polyelectrolytes. In comparison to other non-viral delivery vehicles such as polycation-based complexes, a smaller amount of siRNA was necessary to produce *in vitro* gene silencing as early as 20-30 hours after incubation. Colloidal carriers based on assembled biodegradable polyelectrolytes offer several advantages, such as efficient intracellular delivery after endocytosis followed by release to the cytosol, as well as protection of the siRNA, which is crucial for its therapeutic activity.

KEYWORDS

transfection, gene silencing, non-viral vectors, siRNA, polyplexes, microcapsules

Chemical compounds

polyethylenimine (PubChem CID: 9033); poly-L-arginine (PubChem CID: 6322); dextran sulfate (PubChem SID: 57288723); polyallylamine (Pub Chem CID: 7853); polystyrene sulfonate (Pub Chem CID: 75905)

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