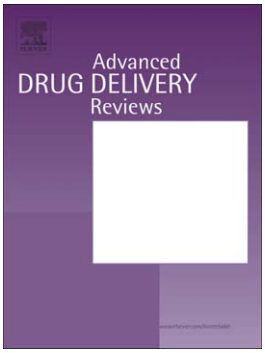

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Peptides for nucleic acid delivery

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Abstract

Nucleic acids and their synthetic oligonucleotide (ON) analogs are a group of gene therapeutic compounds which hold enormous clinical potential. Despite their undoubted potential, clinical translation of these molecules, however, has been largely held back by their limited bioavailability in the target tissues/cells. To overcome this, many different drug delivery systems have been devised. Among others, short delivery peptides, called cell-penetrating peptides (CPPs), have been demonstrated to allow for efficient delivery of nucleic acids and their ON analogs, in both cell culture and animal models. In this review, we provide brief overview of the latest advances in nucleic acid delivery with CPPs, covering the two main vectorization strategies, covalent conjugation and nanoparticle formation-based approach. In conclusion, CPP-based drug delivery systems have the capacity to overcome the hurdle of delivery and thus have the potential to facilitate the clinical translation of nucleic acid-based therapeutics.

Keywords

Cell-penetrating peptides, nucleic acid delivery, oligonucleotides, oligonucleotide delivery, antisense oligonucleotides, siRNA, delivery, nanoparticles, splice-switching oligonucleotides, delivery peptides, peptide conjugates