Special Issue

Recent Trends in Oligonucleotide Based Therapies

Message from the Guest Editors

In the past few decades, significant efforts have been made towards the clinical application of oligonucleotides, mainly antisense DNA and small interfering RNA, with several already hitting the market. However, the potential of the therapeutic applications of RNA-based strategies have recently been spotlighted after the first approval of mRNA vaccines in response to COVID-19 pandemic. These molecules have the power to tackle targets that are usually considered to be "undruggable" by blocking the translation or transcription of a specific gene by stimulating the degradation of a particular messenger RNA. So far, multiple technologies have been developed to enhance oligonucleotide pharmacokinetics and pharmacodynamics. The most commonly used strategies include chemical modification, conjugation to cell-targeting moieties, and nanoparticle formulation. However, despite all of the progress that has been made, their rapid degradation in biological fluids along with the difficulty of crossing physiological barriers make cell delivery a hard task to achieve, and there is still a need for more competent delivery approaches.

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Deadline for manuscript submissions

closed (31 May 2023)

Pharmaceutics

an Open Access Journal by MDPI

Impact Factor 5.5
CiteScore 10.0
Indexed in PubMed

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