Special Issue

Functional Lipid Nanoparticles for Organ-Selective Gene Delivery, Genome Editing and Vaccine Applications

Message from the Guest Editors

The progression of lipid nanoparticles (LNPs) has greatly facilitated their swift and effective application in disease therapy and prevention. This includes the development of LNP-based mRNA vaccines to combat the COVID-19 pandemic, such as Moderna's mRNA-1273 and BioNtech/Pfizer's BNT162b2. Moreover, LNPs exhibit broad potential for applications such as cancer vaccines and advanced therapeutic tools for various diseases. Recent advancements in modifying LNP surface properties or incorporating targeting ligands, like peptides or antibodies, have expanded their applications in selectively delivering genes to specific cells, tissues, or organs. As a non-viral delivery system, LNPs offer advantages such as higher transfection efficiency, biodegradability, and rapid elimination; however, there is an ongoing need for improved targeting effects in future LNP design and fabrication. This Special Issue aims to compile works on the synthesis of functional lipids and explore the biomedical applications of LNPs, with a particular focus on organ-selective gene delivery, genome editing, advanced vaccine applications, and discussions about future directions for LNP development.

Guest Editors

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Deadline for manuscript submissions

closed (1 July 2024)

Bioengineering

an Open Access Journal by MDPI

Impact Factor 3.7
CiteScore 5.3
Indexed in PubMed

mdpi.com/si/193200

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Editor-in-Chief

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