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Investigating lipid formulations for efficient RNA delivery using zebrafish models

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Stellingen behorende bij het proefschrift

Investigating lipid formulations for efficient RNA delivery using zebrafish models

1. The findings underline the complexity of active targeting in vivo and emphasize the value of the zebrafish model in elucidating the mechanisms of active targeting and tissue-specific drug delivery systems. (this thesis)
2. pSar-lipid enable efficient mRNA delivery, and can substitute PEG-lipids in lipid formulations for controlled protein expression within the CNS. (this thesis)
3. Our findings highlight the potential of custom microfluidic devices and materials for mRNA LNPs synthesis to modulate and improve the structure and final performance of mRNA LNPs. (this thesis)
4. The combination of permanent and ionizable cationic lipids in LNP formulation provides an effective endothelial cell delivery of siRNA. (this thesis)
5. Nanoparticle platforms offer an assortment of modifiable features such as size, shape, charge, surface properties and responsiveness that can be selected to optimize delivery for a specific application, therapeutic and patient population. (Nat Rev Drug Discov, 2021)
6. LNP systems contain a variety of modifiable components in addition to the genetic drug payload that clearly offer a considerable toolbox to maximize potency and minimize toxicity. (Mol. Ther, 2017)
7. Ultimately, combining both insights in the materials chemistry of nanoparticle systems and the biological processes of organ-targeted drug delivery, engineers and scientists can provide solutions to unmet clinical needs that deliver the full promises of nanoparticle technologies to patients. (Nat Rev Mater, 2023)
8. A poor understanding of internalization mechanisms can lead to poorly engineered nanoparticles that have suboptimal therapeutic performance and can lead to unexpected results when studying nanoparticles with different cell lines, or when translating nanoparticles from in vitro to in vivo studies. (Nat. Nanotechnol, 2021)
9. A journey of a thousand miles begins with a single step (千里之行，始于足下). -
-- Laozi
10. Don't worry, be happy.