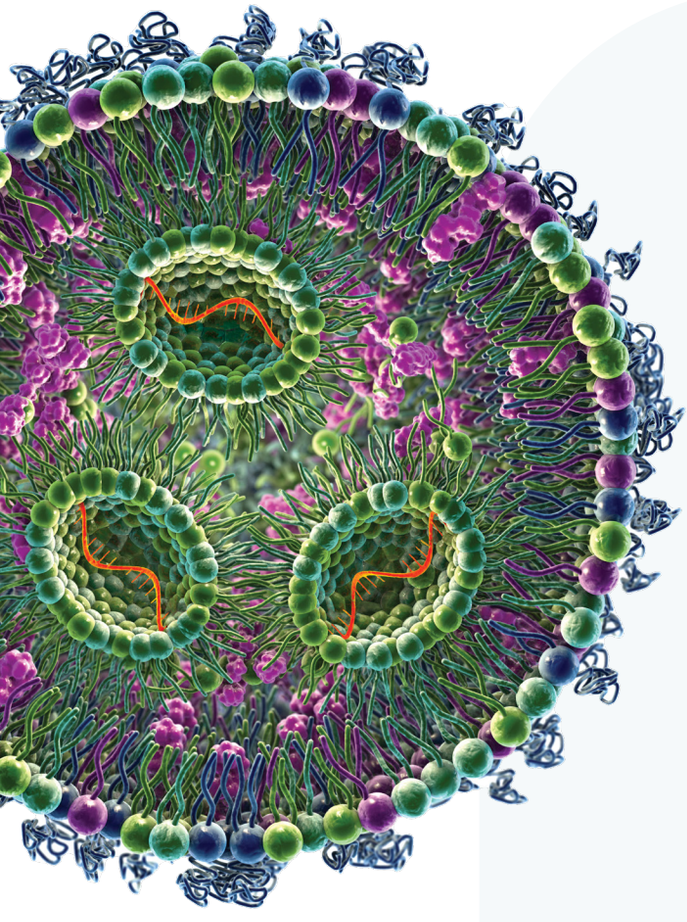
Lipid Nanoparticles (LNPs)

Chemical motifs used to generate lipid nanoparticles for delivery of nucleic acids...



o2h has acquired extensive expertise and capabilities to conduct the synthesis, purification and analysis of diverse and intricate lipid containing molecules, from low milligrams to multi-gram scale.

Our analytical team utilises a range of analytical methods, such as CAD HPLC, to purify and assess these products, ensuring high levels of purity are achieved.

Lipid Nanoparticles (LNPs), or lipid-based delivery systems, allow very small encapsulation particles to be formed, which contain either naturally occurring or novel units containing both hydrophobic (water-repelling) and hydrophilic (water-attracting) sections. The combined properties of these units allow nanoparticle formation that can encapsulate therapeutic materials (such as small molecules, nucleic acids, and proteins) to facilitate delivery of these agents to specific sites within the body. Nanoparticles frequently include a stabilising layer as well as a lipid core, which makes them perfect for encasing a range of different payloads. Lipid nanoparticles come in several types and are optimised depending on their required applications.

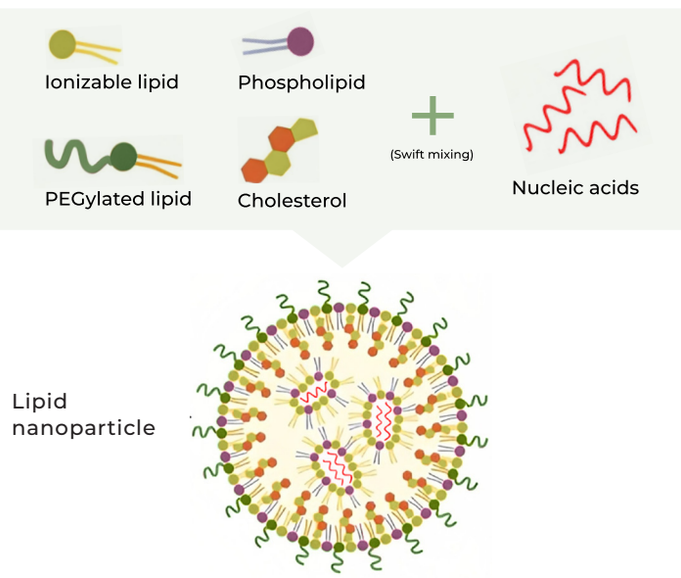


Fig. Demonstration of a lipid nanoparticle and its constituent components.

Key benefits of using LNPs for drug discovery

LNPs provide various benefits in delivering multiple cargos, including:

- More Effective drug delivery for a range of drugs
- Advanced Targeting to a specific cell of tissues
- Biocompatibility and Biodegradability
- Exhibits Non-Immunogenic characteristics
- Low Toxicity, Safe and Effective development
- Adaptability, Versatility and Scalability

"We understand that lipid chemistry is complex and requires significant expertise in synthesis, purification, and analysis. Therefore, we looked for a competent and reliable CRO partner to support our requirements and found o2h discovery. We have now done several projects with o2h."

-Bharat Majeti,
Head of LNP technology,
RVAC Medicines

o2h discovery's expertise in the synthesis of complex & novel lipid molecules

o2h discovery is a widely recognized leader in the field of medicinal chemistry and drug discovery services. Leveraging extensive expertise and experience, o2h discovery has also established itself as a pioneer in the synthesis of intricate and novel lipids, essential scaffolds, and building blocks. These components can be seamlessly integrated into a wide array of target molecules for further advancements in drug delivery applications.

Our expertise in synthesising lipid molecules (for lipid nanoparticles), has been cultivated through close partnerships and access to cutting-edge techniques, rigorous characterization processes, and stringent quality control protocols. Through our proficiency in lipid synthesis, we actively contribute to the progression of drug delivery technologies, fostering the development of groundbreaking therapeutic solutions.

Expertise/Innovative approach

- Expertise in the synthesis of a variety of lipids, such as PEGylated, Fluorescent, and ionisable lipid molecules and building blocks.
- Using high-quality starting materials to avoid contamination of isomeric impurities in our final products.
- Development of specific purification methods to obtain lipid molecules meeting high purity requirements.
- Confirmation of the purity of key intermediates and final lipid compounds through specially developed analytical protocols using suitably sensitive instrumentation for lipid analysis, i.e., CAD HPLC, and relevant analytical columns.
- Characterization of lipid molecules by various other analyses (i.e. LCMS, 1H-NMR) and supplying high-quality materials with COA for further research and testing.
- Customisable project management approach as per the collaborator's requirements.

Accelerate your research and drug discovery programs, leverage our cutting-edge technology and expertise in synthesizing lipid molecules.

Get a Quote:

discovery@o2h.com

o2h.com/lipid-nanoparticles