

NanOZmix-DIY-105

(Dried lipid mix as Do It Yourself (DIY) Lipid Nanoparticle (LNP))

Description

Ready-to-use dried lipid mix at the total lipid concentration of 25 mM when reconstituted in 1mL Ethanol, for LNP-mRNA formulation.

LNPs represent the most effective and safe delivery systems for the translational success of nucleic acid drugs. LNPs are lipidic spherical vesicles formed by a combination of four main components: an ionizable cationic lipid, a helper phospholipid, cholesterol & a pegylated lipid, each having distinct functions (Fig.1). LNPs not only protect RNA from degradation, but also facilitate intracellular uptake and thus potentiate its efficacy. **LNP/RNA** systems self-assemble via electrostatic interactions between negatively charged RNA and ionizable cationic lipids.

NanOZmix-DIY-105 is designed for the development of LNP by customer at their ease by using different formulation methods at different N/P ratio. With our **NanOZmix-DIY-105** system, customers can produce themselves a monodisperse LNP encapsulating mRNA within the size range of 50 nm to 200 nm through microfluidic/ impingement jets mixing (IJM)/T-junction mixing technology with an encapsulation efficiency of 80-96 % under optimized conditions.

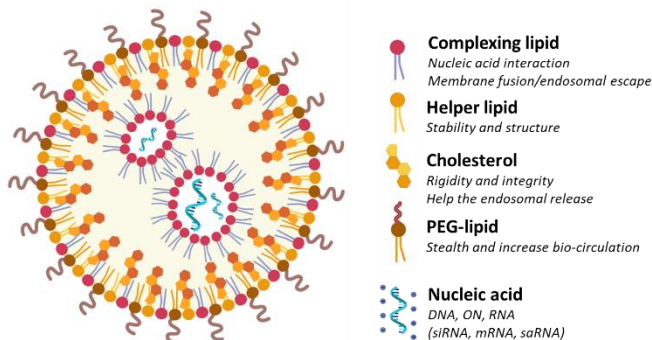


Fig.1. Schematic representation of LNPs-mRNA

Kit contents

LDIY105: Dried 25 mM lipid mix having composition as described in table below:

Lipid mix components	Molecular weight	Molar ratio	mM	mg
FP105	731.2	50	12.5	9.14
DSPC	790.17	10	2.5	1.98
Cholesterol	386.65	38.5	9.62	3.72
DMG-PEG 2000	2509.2	1.5	0.38	0.94
Total		100	25	15.78

Storage

NanOZmix-DIY-105 must be stored at -20°C as a dried film and at -80°C as ethanolic solution. Dried lipidic film can

be stored for 6 months whereas ethanolic solution must be used within one month.

Preparation of 25 mM ethanolic lipid mix stock

Bring the dry film of **NanOZmix-DIY-105** at room temperature from -20°C. Add 1 mL of ethanol in it and vortex it until you see clear solution. If you see sign of precipitation, try to sonicate or heat the ethanolic solution at 60°C for 1-2 min and vortex again.

General protocol for LNP-RNA formulation using NanOZmix-DIY-105 (Recommended N/P ratio 6)

1. Bring the 25 mM ethanolic lipid mix at room temperature.
2. The ethanolic mix can be used as it is or diluted further in ethanol as per customers requirement for different amount of RNA encapsulation as well as exploring different N/P ratio.
3. Prepare the RNA stock solution of desired concentration either in 50 mM citrate or acetate buffer of pH 4.0.
4. Mix the RNA stock solution with ethanolic lipid mix at 3:1 v/v ratio using microfluidic/impingement jets mixing (IJM)/T-junction mixing technology at desired flow rate from 1-12 mL/min.
5. Once the LNPs are prepared they must be diluted or dialyzed with your buffer of choice (1X PBS buffer, Tris buffer or HEPES buffer). Please note that 5% sucrose w/v can be added as cryoprotectant.
6. Filter the final LNP-RNA formulation through sterile PES 0.2 µm filters.
7. LNP-RNA formulations can be concentrated by centrifugation using suitable concentrating centrifugal filters if required.
8. Final formulations can be stored at 4°C for 2 weeks and for longer storage at -80°C.

LNP-RNA formulation can be characterized and validated by various tests and quality parameters presented in below table.

(Note: 25 mM 1 mL ethanolic solution of NanOZmix-DIY-105 can produce 4 mL of LNP-mRNA formulation at 0.1 mg/mL mRNA concentration at N/P 6)

Test and quality parameters	Assays
Particle size and distribution	Dynamic light scattering (DLS)
Charge/zeta potential	Electrophoretic light scattering (ELS) and electroacoustic determination
Encapsulation efficiency	Fluorescent RiboGreen assay or equivalent.
LNP morphology	Microscopy (TEM, Cryo-TEM)
Translation or knockdown efficiency	Cell based reporter assay, Western blot, qPCR
Lipid quantification or stability	HPLC, LCMS

Contact Us

Our company has developed a custom service platform for the LNPs (or polymeric nanoparticles (PNPs)) development using a highly performant microfluidic technology to potentiate nucleic acids/APIs activity. Feel free to contact us for all complementary information and remember to visit our website to stay informed on the latest breakthrough technologies and updated on our complete product list. (www.ozbiosciences.com)

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Purchaser Notification

Limited License

The purchase of the LNP/mRNA grants the purchaser a non-transferable, non-exclusive license to use the included components. This reagent is intended for in-house research only by the buyer. Such use is limited to the transfection of nucleic acids as described in the product manual. In addition, research only use means that this formulation is excluded, without limitation, from resale, repackaging, or use for the making or selling of any commercial product or service without the written approval of OZ Biosciences.

Separate licenses are available from OZ Biosciences for the express purpose of non-research use or applications of the LNP/mRNA. To inquire about such licenses, or to obtain authorization to transfer or use the enclosed material, contact the Director of Business Development at OZ Biosciences.

Buyers may end this License at any time by returning all LNP/mRNA material and documentation to OZ Biosciences, or by destroying LNP/mRNA components. Purchasers are advised to contact OZ Biosciences with the notification that a LNP/mRNA is being returned in order to be reimbursed and/or to definitely terminate a license for internal research use only granted through the purchase of the kit(s).

This document covers entirely the terms of the LNP/mRNA research only license, and does not grant any other express or implied license. The laws of the French Government shall govern the interpretation and enforcement of the terms of this License.

Product Use Limitations

The LNP/mRNA is developed, designed, intended, and sold for research use only. It is not to be used for human diagnostic or included/used in any drug intended for human use. All care and attention should be exercised in the use of the component by following proper research laboratory practices.

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