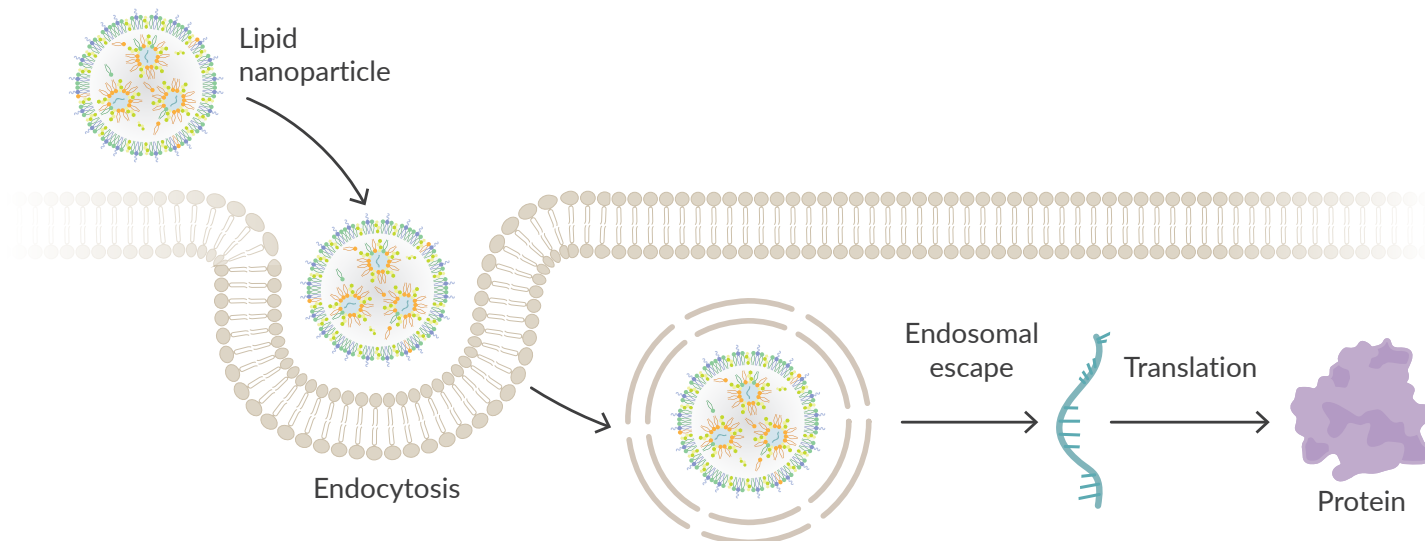


Lipid Nanoparticle Research Tools



Lipid nanoparticles (LNPs) are an ideal lipid-based drug delivery (LBDD) system for nucleic acid therapeutics. Cayman supports the development of LNPs from formulation to validation. We offer an expansive collection of lipid components for LNP formulation, services for custom lipid synthesis and LNP development, as well as tools for LNP target assessment, immunogenicity, and toxicity.



LNPs are internalized by target cells via endocytosis. During endosomal escape, ionizable cationic lipids become positively charged in the acidic environment of the endosome, disrupting the endosomal membrane and releasing the nucleic acids into the cytosol, where translation occurs.

Discover Tools for LNPs



High-Purity Lipids



Payload Delivery



Immunogenicity & Toxicity



Services

A Guide to Lipid Nanoparticle Formulation:

**BASIC CONCEPTS &
PREPARATION PRODECURES**



DOWNLOAD THE GUIDE
www.caymanchem.com/LNP-Guide

High-Purity Lipids

Cationic & Ionizable Cationic Lipids

Cationic lipids are used in LNPs to encapsulate nucleic acid and promote endosomal escape. Cayman offers both ionizable and cationic lipids to suit your application.

FEATURED PRODUCTS

SM-102 - Item No. 33474
 $pK_a = 6.68$

ALC-0315 - Item No. 34337
 $pK_a = 6.09$

DLin-MC3-DMA - Item No. 34364
 $pK_a = 6.44$

SM-102, ALC-0315, and DLin-MC3-DMA are ionizable cationic lipids that have been used in FDA-approved nucleic acid-based therapeutics.

Item No.	Product Name
37096	306-O12B-3
36698	306O ₁₀
34366	93-O17O
34367	93-O17S
36699	C12-200
36700	cKK-E12
36701	DLin-DMA
34363	DLin-KC2-DMA
34364	DLin-MC3-DMA
25726	1,2-Dioleoyl-3-dimethylammonium-propane (DODAP)
15109	1,2-Dioleoyloxy-3-dimethylamino-propane (DODMA)
15110	1,2-Dioleoyl-3-trimethylammoniumpropane (DOTAP) (chloride)
35051	L-319
37122	Lipid C24
34372	Lipid 5
35337	Lipid 29
37652	OF-02

See all cationic & ionizable cationic lipids for LBDD at www.caymanchem.com

Neutral Phospholipids

Neutral phospholipids have a role in membrane fusion and can be used to modify the net surface charge of the LNP.

Phosphocholines (PCs)

Item No.	Product Name
15097	1,2-Dimyristoyl- <i>sn</i> -glycero-3-PC (1,2-DMPC)
15098	1,2-Dioleoyl- <i>sn</i> -glycero-3-PC (1,2-DOPC)
10009473	1,2-Dipalmitoyl- <i>sn</i> -glycero-3-PC (1,2-DPPC)
34800	Phosphatidylcholine (soy)
15102	1-Palmitoyl-2-Oleoyl- <i>sn</i> -glycero-3-PC (1,2-POPC)

Phosphoethanolamines (PEs)

Item No.	Product Name
15091	1,2-Dioleoyl- <i>sn</i> -glycero-3-PE (1,2-DOPE)
15092	1,2-Dipalmitoyl- <i>sn</i> -glycero-3-PE (1,2-DPPE)

See all neutral phospholipids for LBDD at www.caymanchem.com

Anionic Lipids

Anionic lipids prevent particle aggregation during storage.

Phosphoserines (PSs)

Item No.	Product Name
29983	1,2-Dioleoyl- <i>sn</i> -glycero-3-PS (1,2-DOPS) (sodium salt)
15088	1,2-Dipalmitoyl- <i>sn</i> -glycero-3-PS (1,2-DPPS) (sodium salt)
25847	Phosphatidylserine (soy) (sodium salt)

Phosphoglycerols (PGs)

Item No.	Product Name
15084	1,2-Dilauroyl- <i>sn</i> -glycero-3-PG (1,2-DLPG) (sodium salt)
15085	1,2-Dimyristoyl- <i>sn</i> -glycero-3-PG (1,2-DMPG) (sodium salt)
20957	1,2-Dioleoyl- <i>sn</i> -glycero-3-PG (1,2-DOPG) (sodium salt)
15086	1,2-Dipalmitoyl- <i>sn</i> -glycero-3-PG (1,2-DPPG) (sodium salt)
25846	Phosphatidylglycerol (egg) (sodium salt)
15105	1-Palmitoyl-2-Oleoyl- <i>sn</i> -glycero-3-PG (1,2-POPG) (sodium salt)

See all anionic lipids for LBDD at www.caymanchem.com

Discover how different functional groups in
IONIZABLE CATIONIC LIPIDS TUNE LNPS

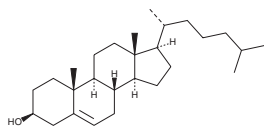
Visit www.caymanchem.com/tune-lipid-design

Sterol Lipids & Cholesterol Derivatives

Sterol lipids and cholesterol derivatives provide stability to LNPs and promote membrane fusion. Endosomal delivery of LNP cargo can also be improved by using modified sterol lipids and cholesterol derivatives.

FEATURED PRODUCT

Cholesterol - Item No. 9003100



A major sterol produced in mammalian cells. It is a major component of LNPs, where it has a role in membrane fusion and stability.

Item No.	Product Name
36187	2,3-Oxidosqualene
25944	2H-Cho-Arg (trifluoroacetate salt)
25943	Cho-Arg (trifluoroacetate salt)
25698	Cholesteryl Hemisuccinate
26439	Cholesteryl Myristate
26471	Cholesteryl Nervonate
26472	Cholesteryl Oleate
16943	DC-Chol (hydrochloride)
26582	DMHAPC-Chol
26583	DMPAC-Chol
26584	HAPC-Chol
26585	MHAPC-Chol
26586	OH-Chol

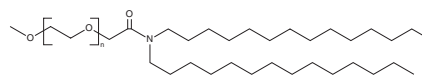
See all sterol lipids for LBDD at www.caymanchem.com

PEGylated Lipids

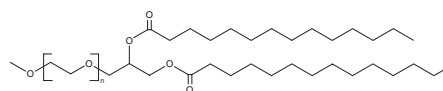
PEGylated lipids prevent opsonization, improving particle stability and increasing its bioavailability.

FEATURED PRODUCTS

ALC-0159 - Item No. 34336



DMG-PEG(2000) - Item No. 33945

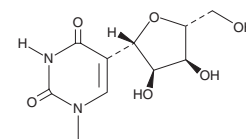


ALC-0159 and DMG-PEG(2000) are PEGylated lipids that have been used in mRNA-based COVID-19 vaccines.

Item No.	Product Name
34647	CLS-MPEG(2000)
34649	DMPE-MPEG(2000)
34650	DPPE-MPEG(2000)
26000	DSPE-PEG(2000)-amine (sodium salt)
34272	DSPE-PEG(2000) Maleimide (ammonium salt)
28181	DSPE-MPEG(2000) (sodium salt)
34652	DSPE-MPEG(5000)

FEATURED PRODUCT

1- Methylpseudouridine Item No. 35401



A nucleoside analog that increases the thermodynamic and biological stability of RNA. It has been incorporated into mRNA for COVID-19 vaccines.

Kickstart Your Discovery with LNP Kits

Simple & Streamlined

Package mRNA or siRNA cargo in LNPs with a complete set of individually packaged reagents without specialized equipment.

LNP Exploration Kits

For the simple preparation of LNPs.

Item No.	Product Name
35425	LNP-102 Exploration Kit
35426	LNP-0315 Exploration Kit
36970	LNP-MC3 Exploration Kit

LNP Uptake Kits

For visualizing LNP uptake.

Item No.	Product Name
38218	LNP-102 Uptake Kit (Green Fluorescence)
38219	LNP-0315 Uptake Kit (Green Fluorescence)

Target Assessment

Target assessment is a critical part of drug discovery that shows therapeutic efficacy of LNPs.

Monitor Endosomal Escape

Endosomal escape is the process by which LNP cargo is delivered to the cytosol.

Item No.	Product Name
16221	Calcein
30752	Cy5 (triethylamine salt)
10011443	LAMP-1/CD107a Monoclonal Antibody
25152	LysoBrite™ Blue

See all fluorescent probes at www.caymanchem.com

Reporter Assays

Determine the effects of LNP cargo on the target of interest or outcomes on downstream signaling events. Cayman has partnered with INDIGO Biosciences to provide nuclear receptor assay kits.

See all reporter assays at www.caymanchem.com

Tools for Luciferase Detection

LNPs with mRNA encoding the reporter protein firefly luciferase are used to determine efficacy and biodistribution.

INDIGlo Luciferase Detection Reagent Kit Item No. 36495

Quantitate luciferase activity in mammalian reporter cells expressing firefly luciferase

- Supplied in a ready-to-use format

Luciferase Assay Reagents

Item No.	Product Name
20398	Luciferase (firefly, recombinant)
25836	D-Luciferin

Immunogenicity & Toxicity

The safety of an LNP depends on the balance between immunogenicity and toxicity.

Immunogenicity Assays

Item No.	Product Name
583301	Interleukin-1 α (human) ELISA Kit
583311	Interleukin-1 β (human) ELISA Kit
501030	Interleukin-6 (human) ELISA Kit
583371	Interleukin-6 (mouse) ELISA Kit
501240	Mouse IgG ELISA Kit

See all immunology assays at www.caymanchem.com

Cellular & Liver Toxicity Assays

Item No.	Product Name
601170	LDH Cytotoxicity Assay Kit
701640	Aspartate Aminotransferase Colorimetric Activity Assay Kit
700260	Alanine Transaminase Colorimetric Activity Assay Kit

LNP DEVELOPMENT SERVICES

We offer end-to-end solutions for LNP-based drug discovery – all from a single-source partner.

- Custom Lipid Synthesis (GMP Available)
- Formulation
- Characterization
- Efficacy & Stability Testing
- Optimization

Learn more at www.caymanchem.com/chemicalsynthesis

SEE HOW WE COMPARED IONIZABLE CATIONIC LIPIDS

and measured LNP transfection efficiency.

View the application note at www.caymanchem.com/LNPnote

