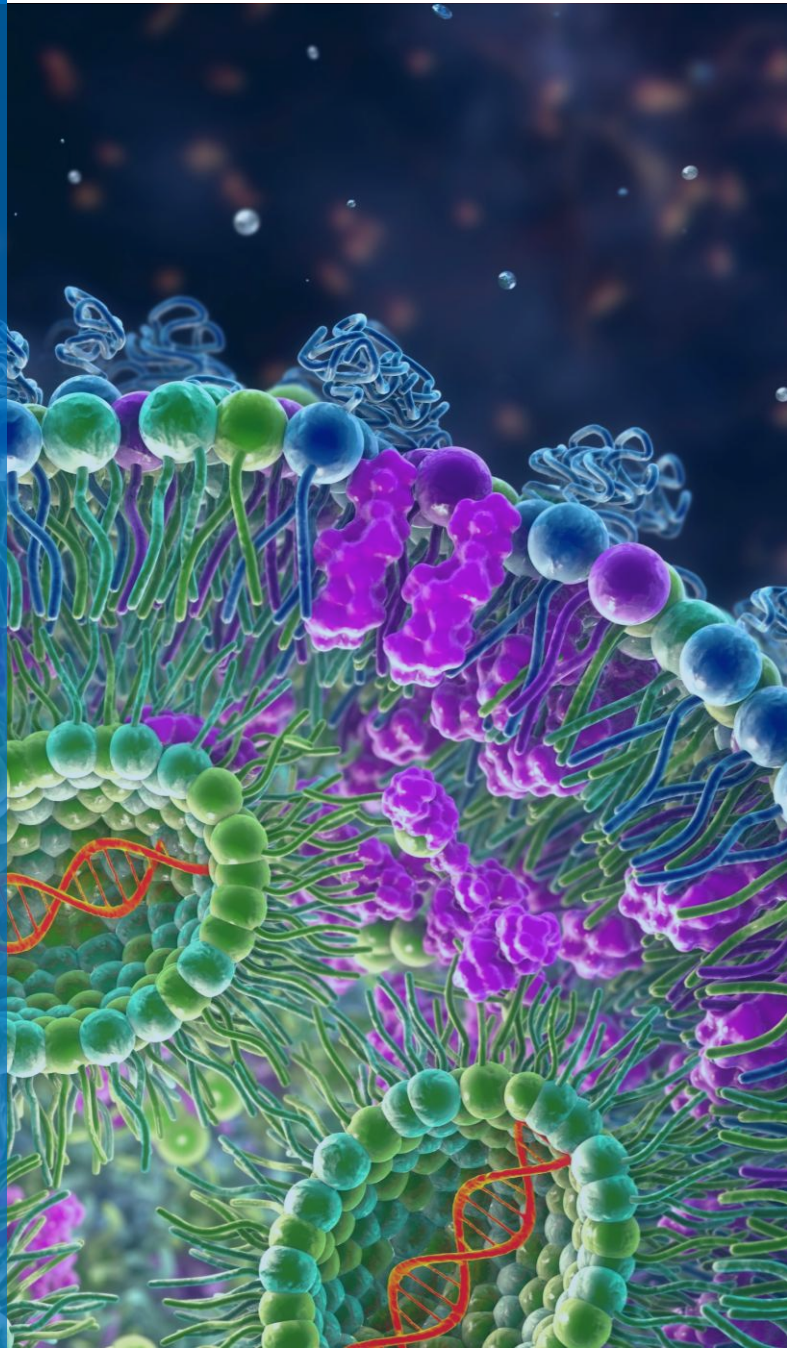
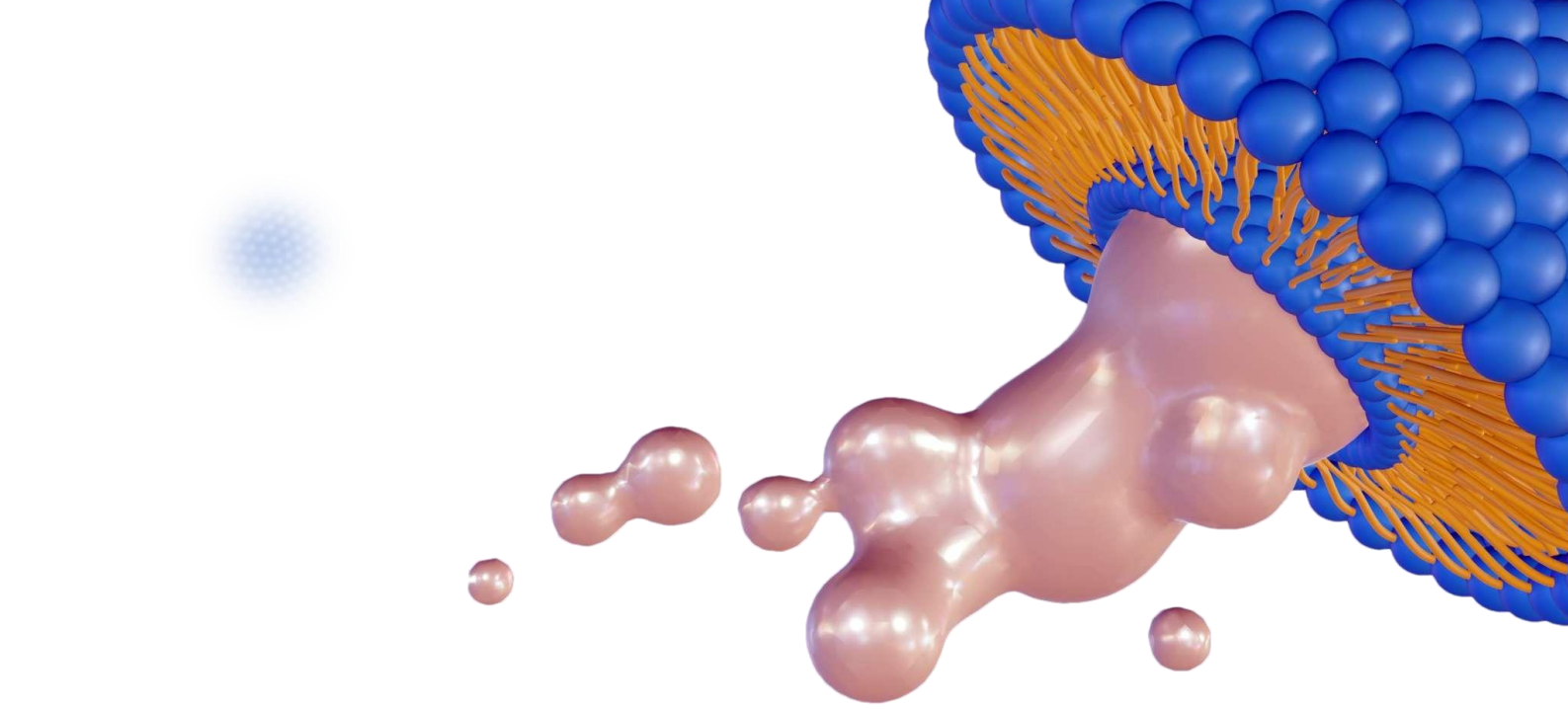


LNP Platforms for *In Vivo* CAR-T Therapy

Strategies and scalable solutions for Immunotherapy using LNPs

Navigating the complexities of in vivo CAR-T delivery demands more than just standard components; it requires a partner with deep expertise in immunology and lipid chemistry. At Creative Biolabs, our comprehensive portfolio of targeted LNPs is meticulously designed to address your specific research hurdles. From precise CD-marker targeting to optimizing mRNA payloads, we provide the tools and scientific support you need to accelerate your discovery and achieve unparalleled results.





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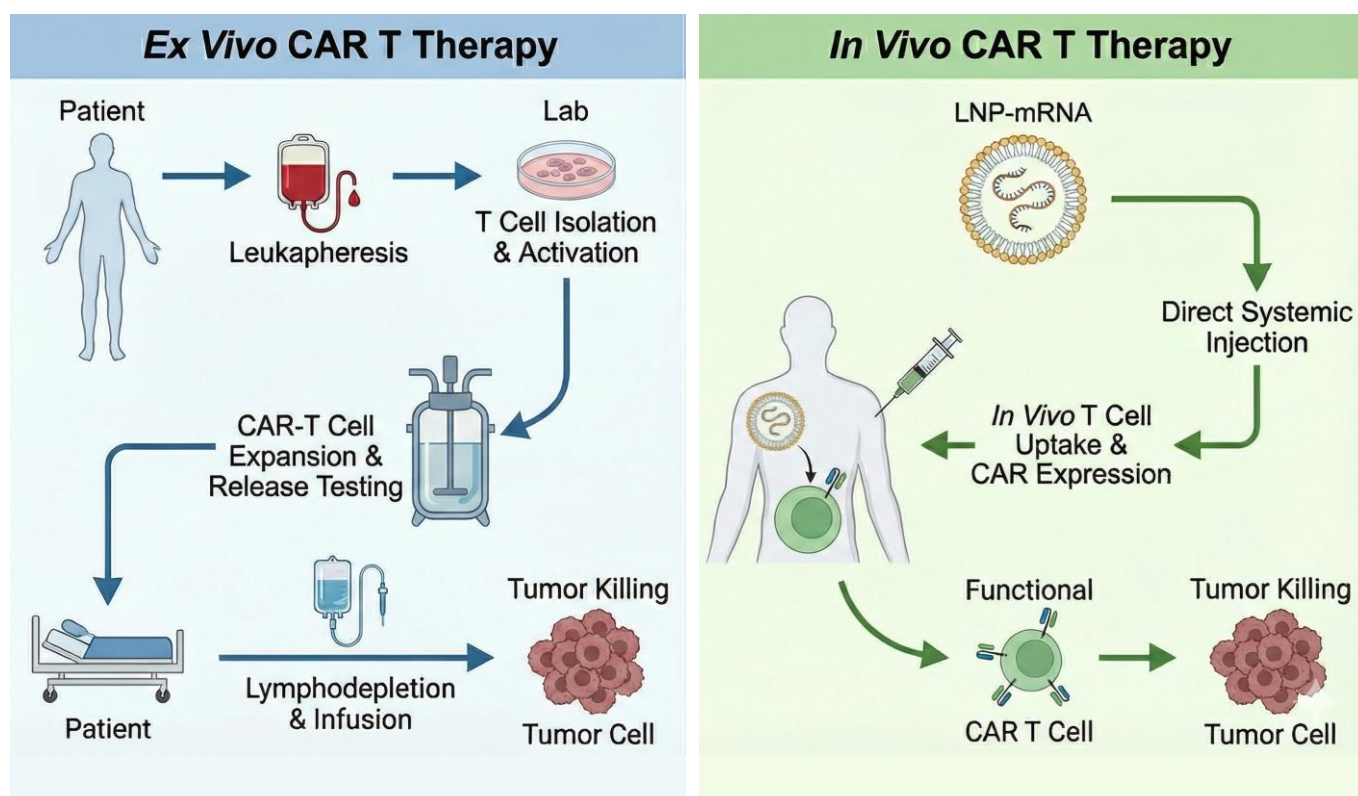
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CAR-T Therapy: Principles & Evolution

Chimeric Antigen Receptor (CAR) T-cell therapy refers to an immune cell therapy that utilizes genetic engineering technology to modify a patient's own (autologous) T cells, enabling them to express CARs. Once modified, these T cells recognize tumor antigens on the surface of tumor cells and are activated, thereby specifically killing the tumor cells.

Comparing *Ex Vivo* & *In Vivo* Strategies

CAR T-cell therapy has fundamentally changed the landscape of cancer treatment. As the field advances, it stands at a pivotal crossroads between the established *ex vivo* approach and the emerging *in vivo* paradigm. This comparison highlights the fundamental shift in strategy—from a complex, personalized cell manufacturing process to a streamlined, off-the-shelf drug.



7-22 Days

- ✓ Proven Clinical Efficacy
- ✓ Durable Response
- Manufacturing Complexity
- Prohibitive Costs
- Scalability Issues



1-3 Days

- ✓ Off-the-Shelf Availability
- ✓ Reduced Complexity & Cost
- ✓ Enhanced Safety
- Targeting Specificity

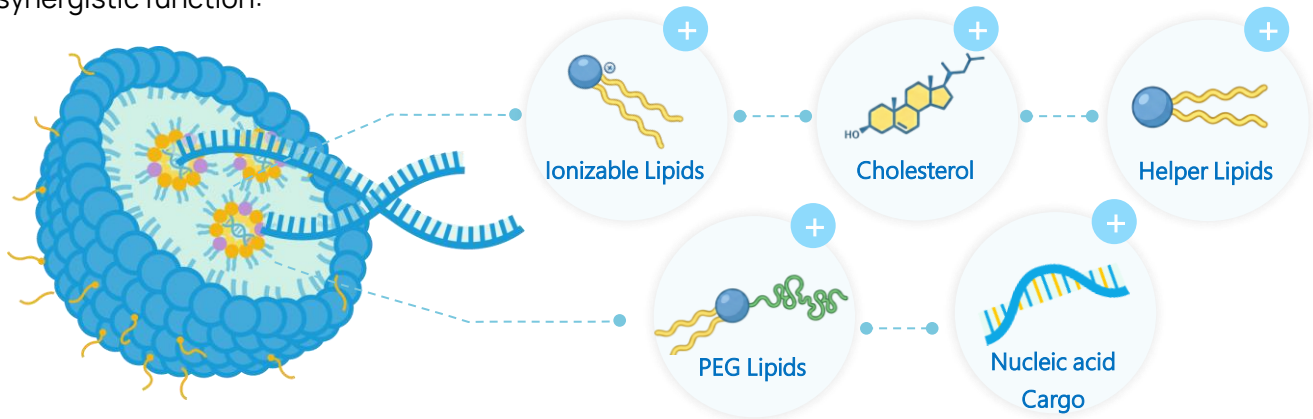
To realize the immense promise of *in vivo* CAR-T, a safe and highly efficient delivery vehicle is paramount. Lipid Nanoparticles (LNPs) have emerged as the key enabling technology to make this revolutionary approach a clinical reality.

LNPs: The Next-generation CAR-T Therapy

Lipid Nanoparticles (LNPs) are sophisticated vesicles designed to protect and deliver therapeutic nucleic acids into cells. Proven by the success of mRNA vaccines, LNPs are now being adapted to deliver the genetic code for CARs directly to T cells, forming the cornerstone of the *in vivo* CAR-T strategy.

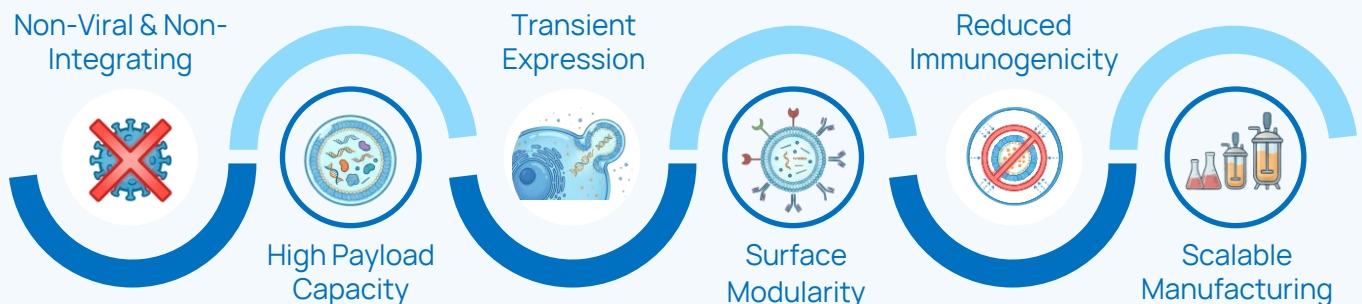
The Composition and Structure of LNP

LNPs are sophisticated nano-assemblies, composed of four key lipid components, each with a critical, synergistic function:



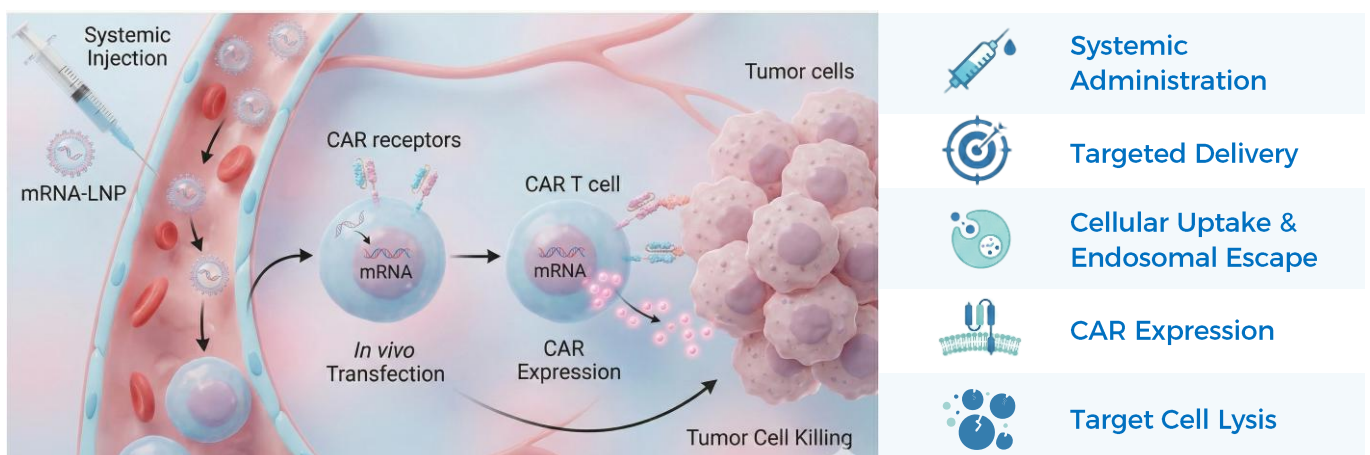
Why LNPs are Ideal for *In Vivo* CAR-T

Compared to other delivery methods, LNPs offer a unique combination of benefits perfectly suited for creating CAR-T cells *in vivo*.



The *In Vivo* CAR-T Delivery Pathway

Our LNP platform orchestrates a precise, multi-step journey to reprogram T cells directly within the patient.



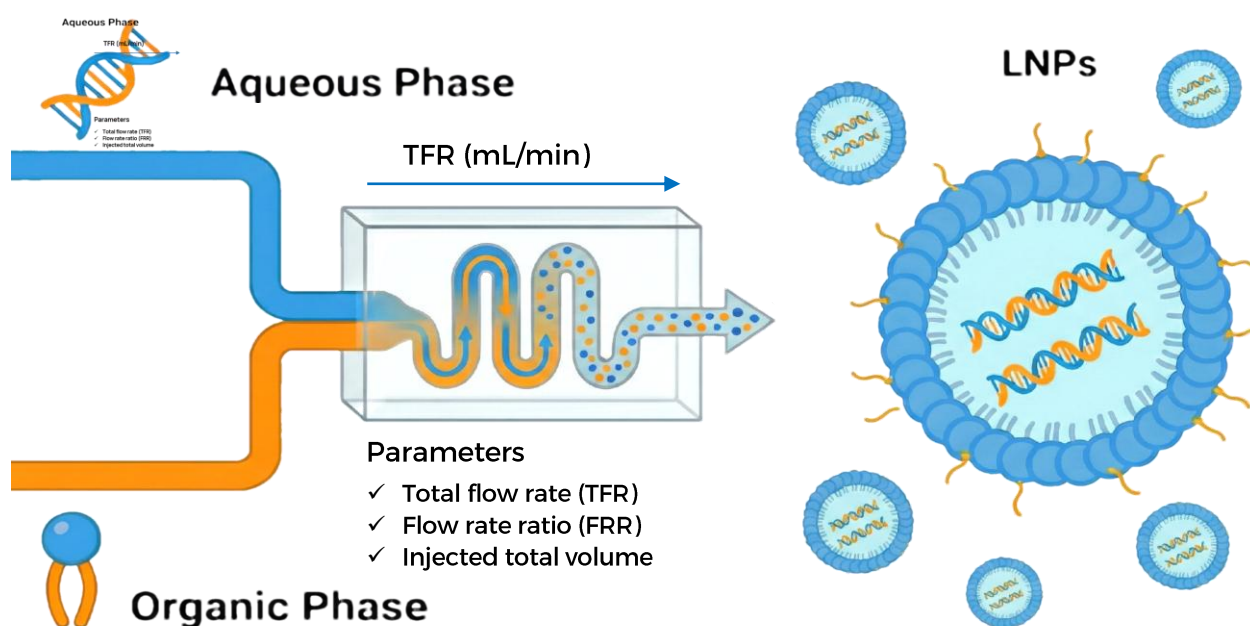
By mastering this pathway, **Creative Biolabs** is at the forefront of developing the next generation of accessible, effective, and safer cell therapies.

Microfluidic for Reproducible LNP Formulation

At **Creative Biolabs**, we have harnessed state-of-the-art microfluidic technology as the core of our LNP manufacturing process. This advanced approach moves beyond the limitations of traditional bulk mixing methods, enabling us to produce lipid nanoparticles with unparalleled precision, exceptional batch-to-batch consistency, and predictable scalability.

Microfluidic Platform: Accelerate your *in vivo* CAR T programs with LNP

Microfluidic technology is the gold standard for manufacturing therapeutic-grade LNPs.



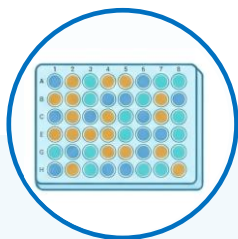
Microfluidic parameters

- Total flow rate (TFR)
- Flow rate ratio (FRR)
- Injected total volume

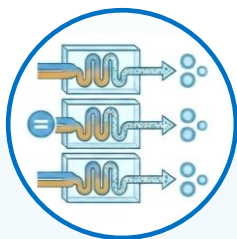
Critical Quality Attributes (CQAs)

- Particle Size & Distribution
- Encapsulation Efficiency
- Morphology
- Polydispersity
- Zeta Potential

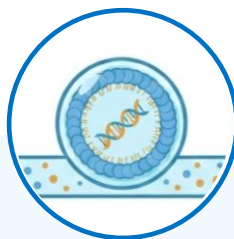
Advantages & Capabilities



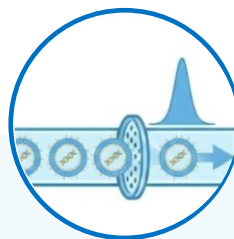
High-Throughput
Formulation Screening



Unmatched
Reproducibility



Efficient & Stable
Encapsulation



Uniform Particle
Formation



Seamless
Scalability

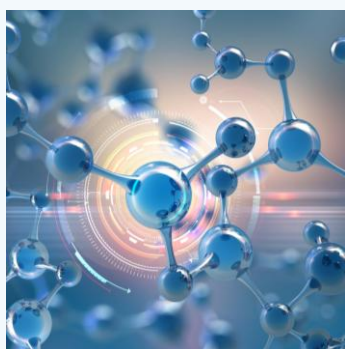
Custom LNP Development Services

Our Comprehensive Custom LNP Service Portfolio

At **Creative Biolabs**, we are more than a component supplier; we are your end-to-end development partner. Our team of PhD-level scientists brings years of hands-on experience in lipid nanotechnology, nucleic acid chemistry, and preclinical drug development. We leverage this deep expertise and mature technology platform to guide your project from initial concept to a fully characterized, *in vivo*-validated therapeutic candidate.

Precision, Reproducibility, and Scalability for LNP Manufacturing

➤ Foundational Component Production

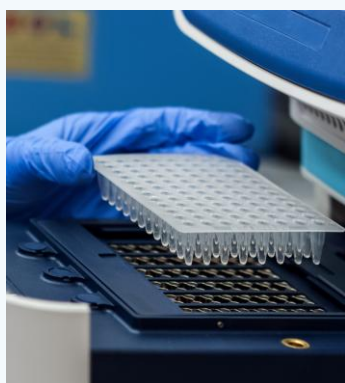


Lipid Synthesis

- ✓ **Flexible Production Scales:** From mg to gram quantities.
- ✓ **Adaptable Purity Grades:** From crude products to >98% purity .
- ✓ **Full Structural Confirmation:** Complete NMR & MASS data
- ✓ **Custom Lipid Chemistries:** Ionizable, helper, and functionalized PEG-lipids.

IVT RNA Production

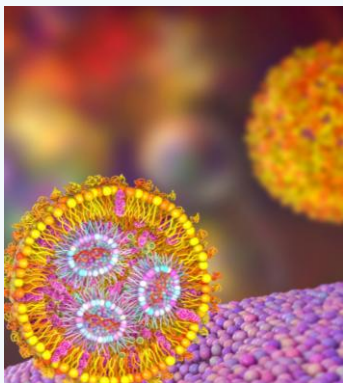
- ✓ **Scalable Manufacturing:** From mg to gram quantities.
- ✓ **Advanced Capping & Modification:** Cap 1, m1Ψ, 5moU, and others.
- ✓ **>95% Purity & High Integrity**
- ✓ **Versatile RNA Modalities:** mRNA, saRNA, circRNA, siRNA, ASO, DNA



High-Throughput LNP Screening

- ✓ **High-Throughput Capability:** Screening hundreds of formulations weekly.
- ✓ **Systematic Optimization:** Rapidly identifying critical parameters.
- ✓ **Automated Microfluidic Platform:** Ensuring reproducibility and reliability.
- ✓ **Data-Driven Formulation Selection:** Pinpointing CQAs.

Custom LNP Development Services

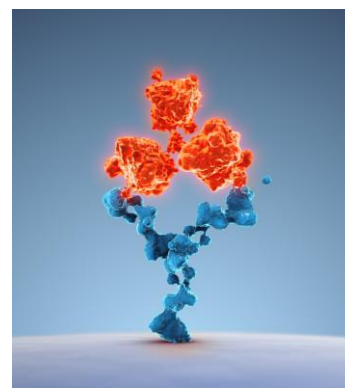


RNA Encapsulation in LNP

- ✓ **Validated Formulation Options:** SM102, DLin-MC3-DMA, LP-01, ALC-0315, and proprietary targeted lipids.
- ✓ **Adjustable Formulation Concentration:** Tunable from 0.1 to 0.4 mg/mL.
- ✓ **Fluorescent Labeling for Tracking:** Dyes such as DiO, Dil, and DiD.
- ✓ **Broad Nucleic Acid Compatibility:** CAR mRNA, circRNA, siRNA, ASO.
- ✓ **Scalable Manufacturing:** For seamless scale-up.

Targeting Ligand Conjugation

- ✓ **Diverse Ligand:** Antibodies (e.g., anti-CD3/5/7/8), peptides, and aptamers.
- ✓ **Conjugation Efficiency:** Measured by nanoscale flow cytometry.
- ✓ **Beyond LNPs:** Conjugation for diverse delivery systems.
- ✓ **Optimized Chemistries:** Utilizing maleimide, NHS, and click chemistry for robust and stable linkages.



Comprehensive Characterization

- ✓ **Physical Attributes:** Consistent size (~100 nm), PDI < 0.2, and controlled zeta potential for stability.
- ✓ **High Encapsulation Efficiency:** Consistently achieving >90%
- ✓ **RNA Integrity:** Confirming cargo.
- ✓ **Quality & Safety Assurance:** Endotoxin testing for *in vivo* use and a detailed CoA with full batch traceability.

ACCELERATE YOUR LNP THERAPY DEVELOPMENT

End-to-End Support from Concept to Clinic.

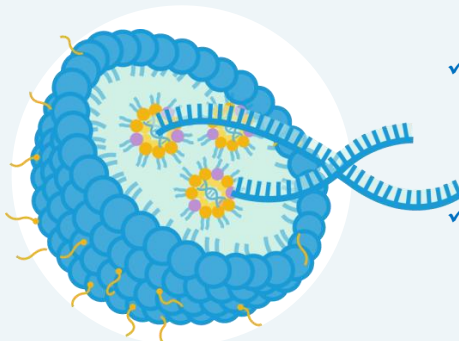
Partner with Us for Your LNP Journey

Our LNPs Product Portfolio

Creative Biolabs provides a comprehensive catalog of high-quality, research-grade LNPs products to accelerate your discovery and preclinical work. Our offerings are designed for seamless integration into your existing workflows.

RNA-LNP Formulations

- ✓ **CAR mRNA-LNP**: Pre-optimized formulations specifically designed for the efficient encapsulation CAR mRNA.
- ✓ **circRNA-LNP**: Tailored for the unique structure and stability of circRNA.



- ✓ **Empty LNP**: Control-grade particles for *in vitro/in vivo* negative controls.
- ✓ **mRNA-LNP**: Ready-to-use formulations for proof-of-concept studies.

➤ Formulation & Payload Options

To ensure our products precisely fit your experimental design, we offer extensive customization options for all our LNP platforms.

LNP Formulation	Nucleic Acid Payloads
SM102	Reporter Genes
DLin-MC3-DMA	Antigens
ALC-0315	Gene Editing
LP-01	Growth Factor
Targeted Lipid	Others

➤ In-Stock LNP Products

Cat. No	Product Name	Payload	Module Type
TDLD-0825-LD9	Empty LNP	Empty	Unconjugation
TDLD-0825-LD10	EGFP mRNA-LNP	EGFP mRNA	Unconjugation
TDLD-0825-LD11	Fluc mRNA-LNP	Firefly Luciferase mRNA	Unconjugation
TDLD-0825-LD12	mCherry mRNA-LNP	mCherry mRNA	Unconjugation
TDLD-0825-LD13	OVA mRNA-LNP	OVA mRNA	Unconjugation
TDLD-0825-LD14	EPO mRNA-LNP	EPO mRNA	Unconjugation
TDLD-0825-LD15	Rluc mRNA-LNP	Renilla Luciferase mRNA	Unconjugation
TDLD-0825-LD16	Gluc mRNA-LNP	Gaussia Luciferase mRNA	Unconjugation
TDLD-0825-LD17	β-Gal mRNA-LNP	Beta-galactosidase mRNA	Unconjugation
TDLD-0825-LD20	Cre mRNA-LNP	Cre mRNA	Unconjugation
TDLD-0825-LD21	mOrange mRNA-LNP	mOrange mRNA	Unconjugation
TDLD-0825-LD26	tdTomato mRNA-LNP	tdTomato mRNA	Unconjugation
TDLD-0825-LD27	EYFP mRNA-LNP	EYFP mRNA	Unconjugation

Our LNPs Product Portfolio

➤ In-Stock CAR mRNA-LNP Products

Cat. No	Product Name	Payload	Module Type
TDLD-0825-LD29	CD5 CAR mRNA-LNP	CD5 CAR mRNA	Unconjugation
TDLD-0825-LD30	CD7 CAR mRNA-LNP	CD7 CAR mRNA	Unconjugation
TDLD-0825-LD31	CD8A CAR mRNA-LNP	CD8A CAR mRNA	Unconjugation
TDLD-0825-LD32	CD20 CAR mRNA-LNP	CD20 CAR mRNA	Unconjugation
TDLD-0825-LD33	CD22 CAR mRNA-LNP	CD22 CAR mRNA	Unconjugation
TDLD-0825-LD34	CD38 CAR mRNA-LNP	CD38 CAR mRNA	Unconjugation
TDLD-0825-LD35	RET CAR mRNA-LNP	RET CAR mRNA	Unconjugation
TDLD-0825-LD36	KIT CAR mRNA-LNP	KIT CAR mRNA	Unconjugation
TDLD-0825-LD37	MET CAR mRNA-LNP	MET CAR mRNA	Unconjugation
TDLD-0825-LD38	PDGFRA CAR mRNA-LNP	PDGFRA CAR mRNA	Unconjugation
TDLD-0825-LD39	CD66E CAR mRNA-LNP	CD66E CAR mRNA	Unconjugation
TDLD-0825-LD40	EpCAM CAR mRNA-LNP	EpCAM CAR mRNA	Unconjugation
TDLD-0825-LD41	DLL3 CAR mRNA-LNP	DLL3 CAR mRNA	Unconjugation
TDLD-0825-LD42	MSLN CAR mRNA-LNP	MSLN CAR mRNA	Unconjugation
TDLD-0825-LD43	TACSTD2 CAR mRNA-LNP	TACSTD2 CAR mRNA	Unconjugation
TDLD-0825-LD44	HER3 CAR mRNA-LNP	HER3 CAR mRNA	Unconjugation
TDLD-0825-LD45	GPRC5D CAR mRNA-LNP	GPRC5D CAR mRNA	Unconjugation
TDLD-0825-LD47	GPC3 CAR mRNA-LNP	GPC3 CAR mRNA	Unconjugation
TDLD-0825-LD48	CD19 CAR mRNA-LNP	CD19 CAR mRNA	Unconjugation
TDLD-0825-LD49	BCMA CAR mRNA-LNP	BCMA CAR mRNA	Unconjugation
TDLD-0825-LD50	HER2 CAR mRNA-LNP	HER2 CAR mRNA	Unconjugation
TDLD-0825-LD51	PSMA CAR mRNA-LNP	PSMA CAR mRNA	Unconjugation
TDLD-0825-LD52	CD37 CAR mRNA-LNP	CD37 CAR mRNA	Unconjugation
TDLD-0825-LD53	CD70 CAR mRNA-LNP	CD70 CAR mRNA	Unconjugation
TDLD-0825-LD54	CD147 CAR mRNA-LNP	CD147 CAR mRNA	Unconjugation
TDLD-0825-LD55	MUC1 CAR mRNA-LNP	MUC1 CAR mRNA	Unconjugation
TDLD-0825-LD56	AXL CAR mRNA-LNP	AXL CAR mRNA	Unconjugation
TDLD-0825-LD57	CS1 CAR mRNA-LNP	CS1 CAR mRNA	Unconjugation
TDLD-0825-LD58	EGFR CAR mRNA-LNP	EGFR CAR mRNA	Unconjugation

Our LNPs Product Portfolio

➤ In-Stock circRNA-LNP Products

Cat. No	Product Name	Payload	Module Type
TDLD-0825-LD59	β-Gal CircRNA-LNP	Beta-galactosidase CircRNA	Unconjugation
TDLD-0825-LD60	EGFP CircRNA-LNP	EGFP CircRNA	Unconjugation
TDLD-0825-LD61	Fluc CircRNA-LNP	Firefly Luciferase CircRNA	Unconjugation
TDLD-0825-LD62	mCherry CircRNA-LNP	mCherry CircRNA	Unconjugation
TDLD-0825-LD63	OVA CircRNA-LNP	OVA CircRNA	Unconjugation

Targeted LNP Components & Kits

Our comprehensive portfolio provides both ready-to-use, pre-targeted products and versatile kits to empower you to create custom, cell- and tissue-specific delivery systems with high precision.



- **Pep-LNP:** Formulations containing targeting peptides for applications such as tumor homing, blood-brain barrier (BBB) penetration, or organelle-specific delivery.
- **Ab-LNP:** Pre-formulated LNPs decorated with targeting antibodies for selective cell-type targeting.
- **Multiple LNP Formulation Kits:** These kits provide all the necessary components and protocols to develop and optimize your own LNP systems for specific applications.

➤ In-Stock Pep-LNP Products

Cat. No	Product Name	Payload	Targeting Module
TDLD-0825-LD70	YIGSR Pep-LNP	Empty, mRNA, CircRNA	YIGSR Peptide
TDLD-0825-LD71	HHC36 Pep-LNP	Empty, mRNA, CircRNA	HHC36 Peptide
TDLD-0825-LD72	RVG29 Pep-LNP	Empty, mRNA, CircRNA	RVG29 Peptide
TDLD-0825-LD73	ANG Pep-LNP	Empty, mRNA, CircRNA	Angiopep-2 Peptide
TDLD-0825-LD74	T7 Pep-LNP	Empty, mRNA, CircRNA	T7 Peptide
TDLD-0825-LD75	CGKRK Pep-LNP	Empty, mRNA, CircRNA	CGKRK Peptide
TDLD-0825-LD76	M2pep Pep-LNP	Empty, mRNA, CircRNA	M2pep Peptide
TDLD-0825-LD77	NGR Pep-LNP	Empty, mRNA, CircRNA	NGR Peptide
TDLD-0825-LD78	R8 Pep-LNP	Empty, mRNA, CircRNA	R8 Peptide
TDLD-0825-LD79	RGD Pep-LNP	Empty, mRNA, CircRNA	RGD Peptide
TDLD-0825-LD80	iRGD Pep-LNP	Empty, mRNA, CircRNA	iRGD Peptide
TDLD-0825-LD81	TAT Pep-LNP	Empty, mRNA, CircRNA	TAT Peptide
TDLD-0825-LD82	CTT2 Pep-LNP	Empty, mRNA, CircRNA	CTT2 Peptide

Our LNPs Product Portfolio

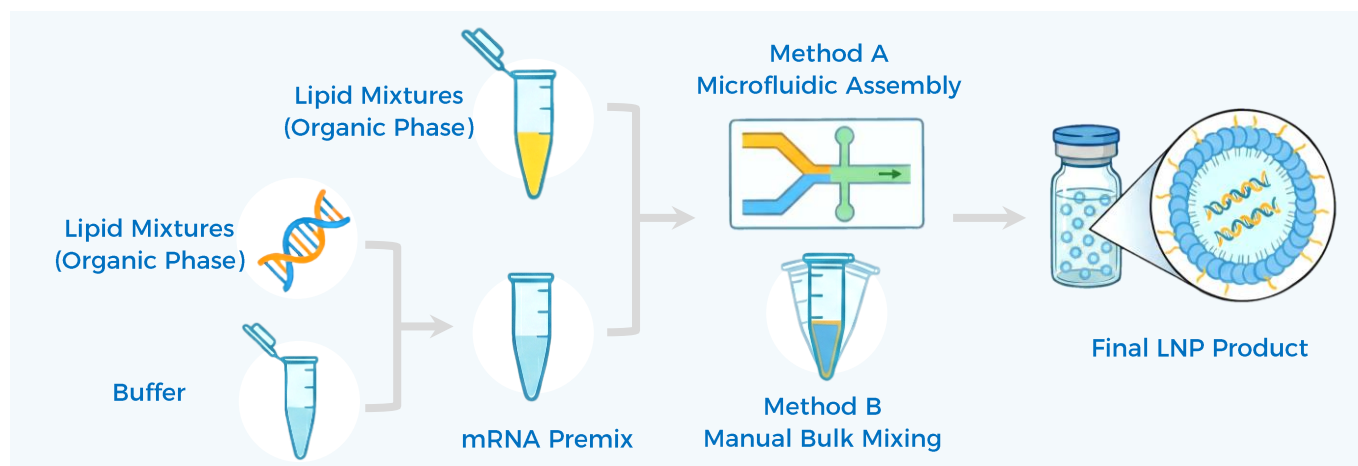
Cat. No	Product Name	Payload	Targeting Module
TDLD-0825-LD83	PTP Pep-LNP	Empty, mRNA, CircRNA	PTP Peptide
TDLD-0825-LD84	pPB Pep-LNP	Empty, mRNA, CircRNA	pPB Peptide
TDLD-0825-LD85	R6H4 Pep-LNP	Empty, mRNA, CircRNA	R6H4 Peptide
TDLD-0825-LD86	SP94 Pep-LNP	Empty, mRNA, CircRNA	SP94 Peptide
TDLD-0825-LD87	Asp8 Pep-LNP	Empty, mRNA, CircRNA	Asp8 Peptide
TDLD-0825-LD88	ASP6 Pep-LNP	Empty, mRNA, CircRNA	ASP6 Peptide
TDLD-0825-LD89	APRPG Pep-LNP	Empty, mRNA, CircRNA	APRPG Peptide
TDLD-0825-LD90	VIP Pep-LNP	Empty, mRNA, CircRNA	VIP Peptide
TDLD-0825-LD91	GE11 Pep-LNP	Empty, mRNA, CircRNA	GE11 Peptide
TDLD-0825-LD92	CTP Pep-LNP	Empty, mRNA, CircRNA	CTP Peptide
TDLD-0825-LD93	PCM Pep-LNP	Empty, mRNA, CircRNA	PCM Peptide
TDLD-0825-LD94	BR2 Pep-LNP	Empty, mRNA, CircRNA	BR2 Peptide
TDLD-0825-LD95	FSHB Pep-LNP	Empty, mRNA, CircRNA	FSHB Peptide
TDLD-0825-LD96	NYZL1 Pep-LNP	Empty, mRNA, CircRNA	NYZL1 Peptide
TDLD-0825-LD97	YSA Pep-LNP	Empty, mRNA, CircRNA	YSA Peptide
TDLD-0825-LD98	A7R Pep-LNP	Empty, mRNA, CircRNA	A7R Peptide
TDLD-0825-LD99	EB1 Pep-LNP	Empty, mRNA, CircRNA	EB1 Peptide
TDLD-0825-LD100	CPP Pep-LNP	Empty, mRNA, CircRNA	CPP Peptide
TDLD-0825-LD101	MPG Pep-LNP	Empty, mRNA, CircRNA	MPG Peptide
TDLD-0825-LD102	F3 Pep-LNP	Empty, mRNA, CircRNA	F3 Peptide
TDLD-0825-LD103	KAA Pep-LNP	Empty, mRNA, CircRNA	KAA Peptide
TDLD-0825-LD104	GPC3 Pep-LNP	Empty, mRNA, CircRNA	GPC3 Peptide
TDLD-0825-LD105	CCK8 Pep-LNP	Empty, mRNA, CircRNA	CCK8 Peptide
TDLD-0825-LD106	K237 Pep-LNP	Empty, mRNA, CircRNA	K237 Peptide
TDLD-0825-LD107	Esbp Pep-LNP	Empty, mRNA, CircRNA	Esbp Peptide

➤ In-Stock Ab-LNP Products

Cat. No	Product Name	Payload	Targeting Module
TDLD-0825-LD64	Targeted CD3 Ab-LNP	Empty, mRNA, CircRNA	CD3 Antibody
TDLD-0825-LD65	Targeted CD4 Ab-LNP	Empty, mRNA, CircRNA	CD4 Antibody
TDLD-0825-LD66	Targeted CD5 Ab-LNP	Empty, mRNA, CircRNA	CD5 Antibody
TDLD-0825-LD67	Targeted CD7 Ab-LNP	Empty, mRNA, CircRNA	CD7 Antibody
TDLD-0825-LD68	Targeted CD34 Ab-LNP	Empty, mRNA, CircRNA	CD34 Antibody
TDLD-0825-LD69	Targeted CD117 Ab-LNP	Empty, mRNA, CircRNA	CD117 Antibody

Our LNPs Product Portfolio

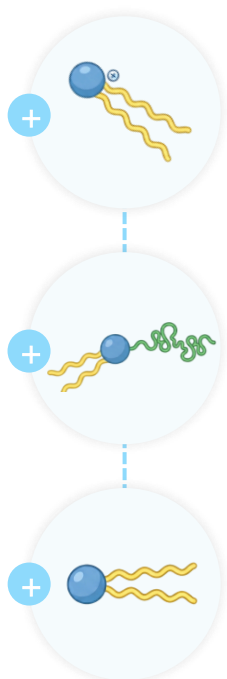
➤ Multiple LNP Formulation Kits



Cat. No	Product Name	Components	Quantity
TDLD-0825-LD1	LNP Formulation Kit (Universal)	Lipid mixtures, Buffers	1 mL; 3 mL; 6 mL
TDLD-0825-LD2	Lyophilized LNP Formulation Kit (RNA)	Lipid mixtures, Buffers	1 mL
TDLD-0825-LD3	Targeted LNP Formulation Kit	Lipid mixtures, Buffers	0.1 mL; 0.5 mL; 1.0 mL
TDLD-0825-LD4	LNP Screening Array Kit	Lipid mixtures	8 Wells; 24 Wells; 96 Wells
TDLD-0825-LD5	LNP-based Tumor Cell Transfection Kit	Lipid mixtures, Buffers	
TDLD-0825-LD6	LNP-based Stem Cell Transfection Kit	Lipid mixtures, Buffers	1.5 mL; 3.0 mL; 5.0 mL
TDLD-0825-LD7	RNA-LNP Encapsulation Assay Kit	RiboGreen dye, RNA-LNP reference material, buffer	
TDLD-0825-LD8	Lipid-Protein Conjugation Kit (Universal)	Lipid, Buffers	5 mg; 20 mg; 50 mg

Comprehensive LNP Materials & Lipid Library

Beyond our standard formulations, we provide a full suite of high-purity raw materials and a proprietary library of ionizable lipids to empower your custom LNP development projects.



Ionizable Lipids

Our library of industry-leading and next-generation ionizable lipids helps you optimize delivery efficiency, targeting, and safety. Our selection includes, but is not limited to:

SM102

ALC-0315

LP-01

DLin-MC3-DMA

Targeted Lipid

Helper Lipids

Build stable, high-performance LNPs with our premium helper lipids, engineered for optimal membrane fusion and efficient endosomal escape.

HSPC

DSPC

DOPE

DOPC

Helper Lipids

Enhance your LNP's stability and circulation time with our advanced PEGylated lipids, designed for superior *in vivo* performance and targeting.

DSPE-PEG-Mal

DSPE-PEG2000

DSPE-PEG-Biotin

DSPE-PEG-N₃

Case Studies

Our commitment to quality and innovation is demonstrated through our work. We navigate complex scientific challenges to deliver LNP solutions that meet the most demanding specifications, accelerating your research from concept to validation.

Case Study 1 Literature-Based LNP Optimization with Protamine

We successfully replicated and validated a promising LNP formulation from a high-impact journal that utilized protamine for enhanced mRNA delivery. This required precise control over the N/P ratio to balance high encapsulation with particle stability.

Z-Average	105.5 nm
PDI	0.173
Zeta Potential	-9.51 mV
Encapsulation Efficiency	91.6 %
mRNA concentration	125.9 µg/mL

- ✓ **Objective:** Replicate a protamine-based LNP formulation from literature.
- ✓ **Key Parameter:** Optimized the N/P ratio to balance encapsulation efficiency and stability.
- ✓ **Outcome:** Identified the optimal parameters, achieving high encapsulation efficiency and a narrow particle size distribution.

Case Study 2 Co-Encapsulation of a Mixed Peptide Payload

We developed a novel LNP system for the co-delivery of two distinct therapeutic peptides. This project required a sophisticated formulation capable of efficiently and stably co-encapsulating two molecules with potentially different physicochemical properties, ensuring their synchronized delivery to the target site.

- ✓ **Objective:** Co-deliver two different therapeutic peptides in a single LNP particle.
- ✓ **Scope:** Managed the entire workflow from custom peptide synthesis to the development of a unified LNP formulation.
- ✓ **Outcome:** Generated stable, monodisperse LNPs with high co-encapsulation efficiency for both peptide components.

Z-Average	105.2 nm
PDI	0.087
Zeta Potential	3.497 mV
Encapsulation Efficiency	79.36 %
mRNA concentration	0.218 mg/mL

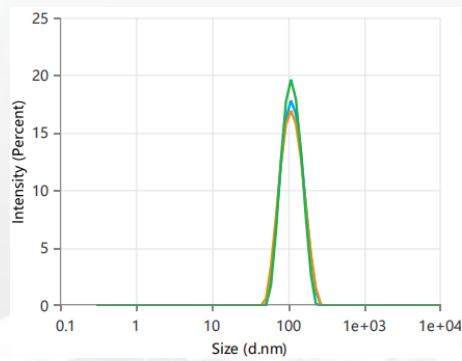


Fig 1. Particle Size Distribution.

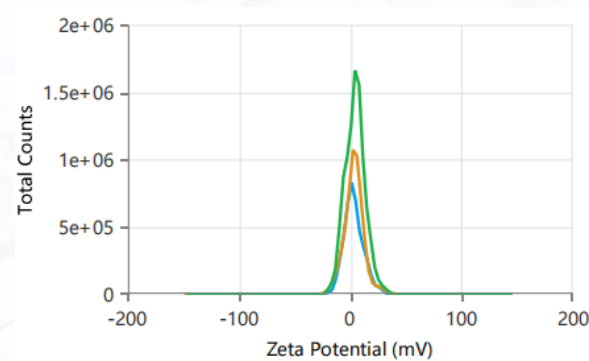


Fig 2. Zeta Potential Measurement.

Case Study 3 mCherry mRNA-LNP (Cat: TDLD-0825-LD12)

Our standard mCherry mRNA-LNP is a robust, off-the-shelf product designed as a positive control or a reliable research tool.

- ✓ **Application:** Standard positive control or research tool.
- ✓ **Performance:** Achieves high and consistent expression across multiple cell types.
- ✓ **Advantage:** Provides a rapid, clear readout for transfection experiments.

Payload: mCherry mRNA (CAP 1, m1Ψ)

Lipid Formulation: LP01

mRNA Concentration: 0.2 mg/ml

Module Type: Unconjugated

Z-Average	PDI	Zeta Potential	Encapsulation Efficiency	mRNA concentration
84.3 nm	0.118	4.651 mV	88.36%	0.2 mg/mL

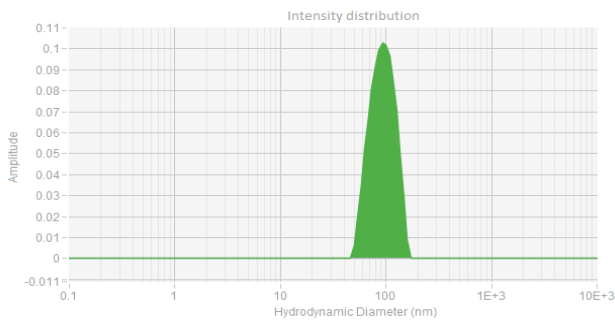


Fig 1. Particle Size Distribution.

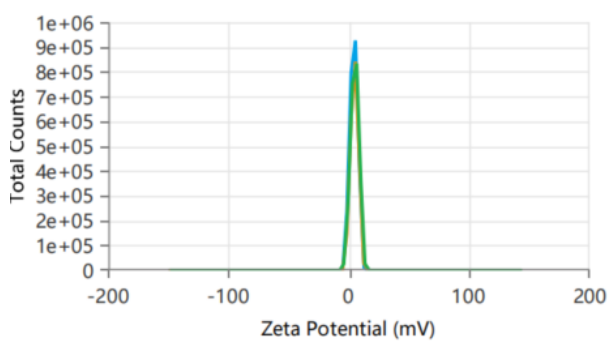


Fig 2. Zeta Potential Measurement.

➤ mRNA Integrity

Agarose gel electrophoresis is used to confirm that the mRNA cargo remains intact and protected from degradation after encapsulation within the LNP.

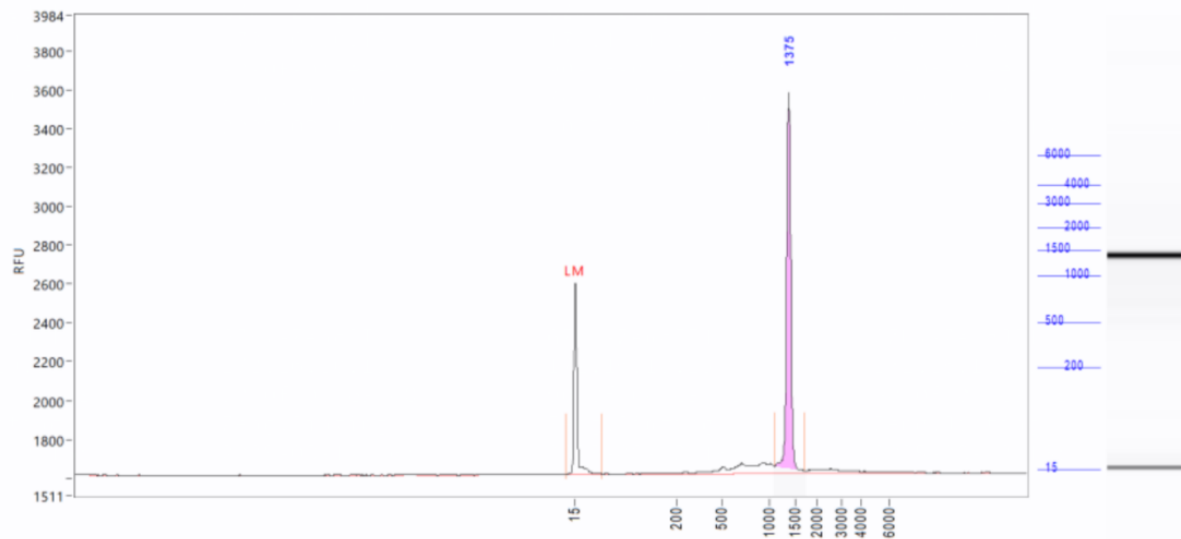
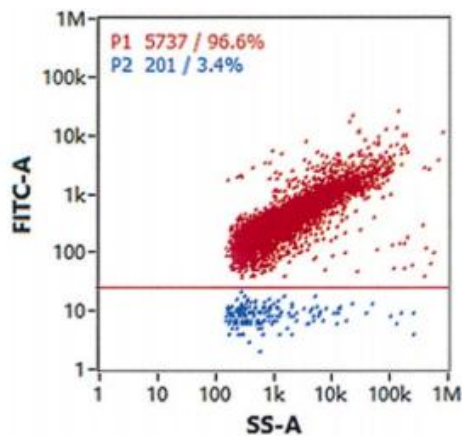


Fig 3. mRNA integrity analysis of mCherry mRNA-LNP.

Case Study 4

Targeted CD5 Ab-LNP (Cat: TDLD-0825-LD66)

This targeted LNP platform is engineered for specific delivery to CD5-expressing T cells. By conjugating a high-affinity anti-CD5 antibody, we enable precise targeting, making it an ideal tool for studying T-cell modulation. The data below is from a specified configuration, showcasing our targeting capabilities.



Payload: EGFP mRNA (CAP 1, m1Ψ)

Lipid Formulation: SM102

mRNA Concentration: 0.1 mg/ml

Module Type: Anti-CD5 Antibody

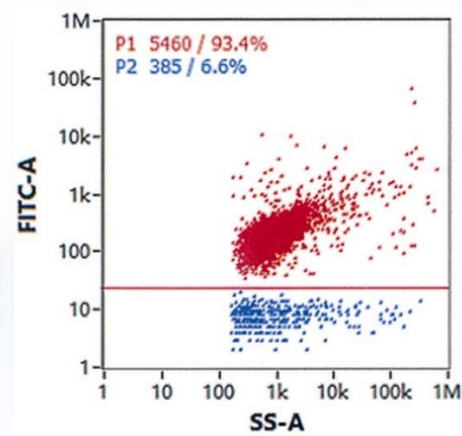
Fig 1. Flow cytometry histogram of Targeted CD5 Ab-LNP.

Z-Average	PDI	Protein Positivity Rate	Encapsulation Efficiency	mRNA concentration
69.7 nm	0.140	96.6	91.0%	0.1 mg/mL

Case Study 5

Targeted CD8 Ab-LNP

Developed for precise targeting of cytotoxic CD8+ T cells, this LNP is conjugated with a high-specificity anti-CD8 antibody. It is an essential tool for research into anti-tumor immunity, vaccine development, and strategies that require the specific manipulation of this critical immune cell population.



Payload: EGFP mRNA (CAP 1, m1Ψ)

Lipid Formulation: SM102

mRNA Concentration: 0.1 mg/ml

Module Type: Anti-CD8 Antibody

Fig 2. Flow cytometry histogram of Targeted CD8 Ab-LNP.

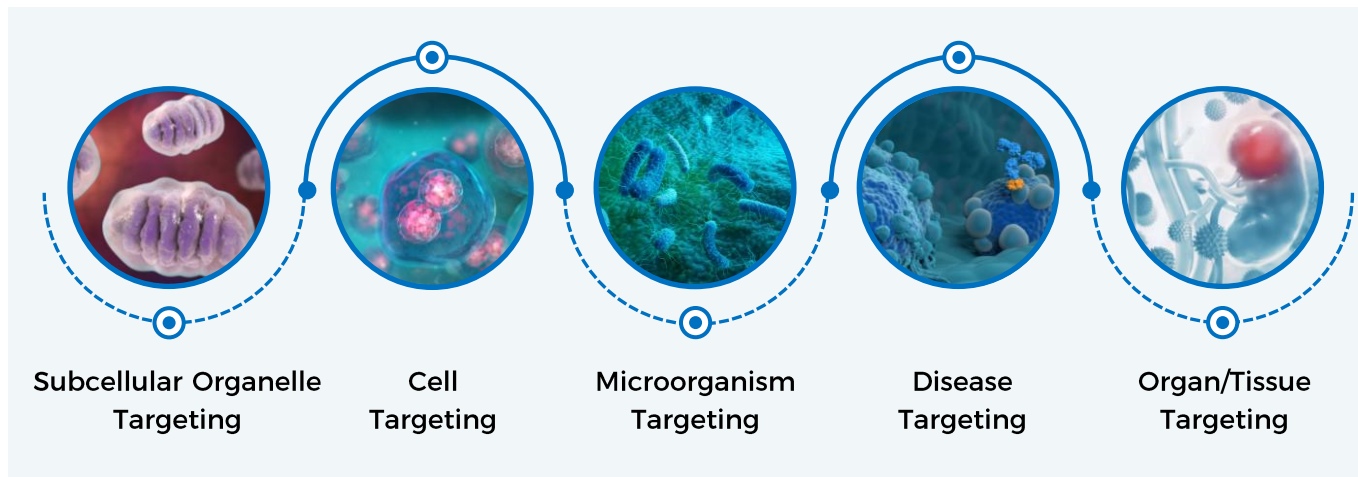
Z-Average	PDI	Protein Positivity Rate	Encapsulation Efficiency	mRNA concentration
84.08 nm	0.08	93.4	90.1%	0.1 mg/mL

Partner with Us for Your LNP Journey

A Modular Platform for Targeted Delivery

The scientific journey from concept to a validated *in vivo* therapy is complex and filled with technical hurdles. At **Creative Biolabs**, our mission is to provide the tools, technologies, and expertise to help you navigate this journey with confidence and speed.

Our Targeted Delivery Strategy



- **Module Delivery Systems**: Our comprehensive portfolio includes a curated library of next-generation ionizable lipids, high-purity helper lipids, cholesterol, and PEG-lipids. These are the building blocks for creating highly efficient, stable, and scalable nanoparticle cores.
- **Targeted Modules**: We offer a wide array of solutions for achieving specificity. This includes a catalog of functionalized lipids for conjugation (Maleimide, NHS, Azide), and a selection of high-affinity targeting ligands, including peptides and antibody fragments (e.g., anti-CD3, anti-CD5, anti-CD8).

By integrating these modules, you can rapidly prototype and screen dozens of tLNP formulations in your lab. This modularity drastically reduces development time and empowers you to focus on the biology, not the formulation chemistry.

Creative Biolabs: Your Partner for Targeted Drug Delivery





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