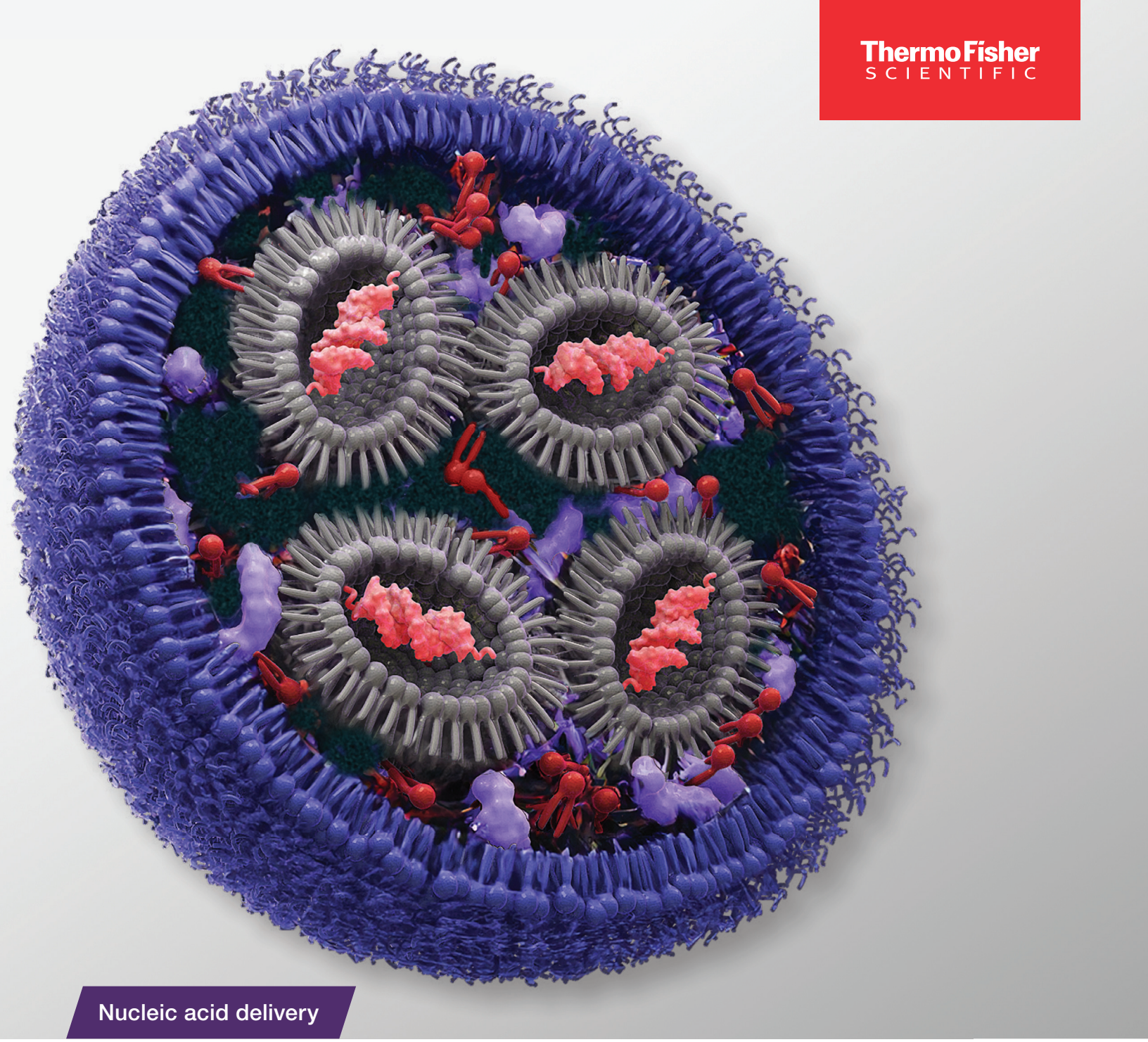
ThermoFisher SCIENTIFIC



Nucleic acid delivery

Vivofectamine Delivery Solutions

Advanced lipid nanoparticle technology

invitrogen

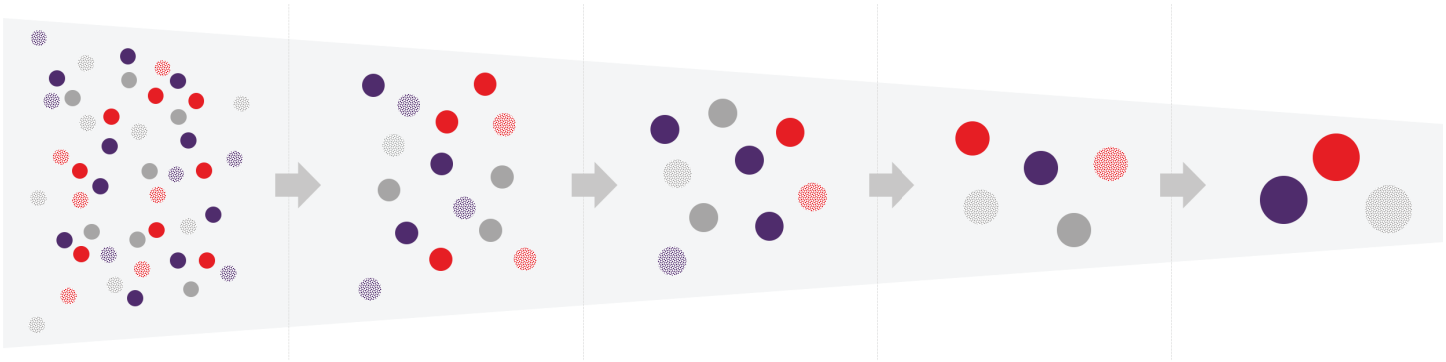
Vivofectamine Delivery Solutions: The premier choice for *in vivo* delivery

Discover a world of possibilities with Invitrogen™ Vivofectamine™ Delivery Solutions for utilizing lipid nanoparticle (LNP) technology. Rationally designed for *in vivo* delivery of nucleic acid vaccines and therapeutics, Vivofectamine products and services offer you a distinct edge in basic research and therapeutics development. These LNPs offer **versatility**, **safety**, and **acceleration** of your project timelines.

Versatility | Chemical diversity, flexible formats, and adaptable licensing

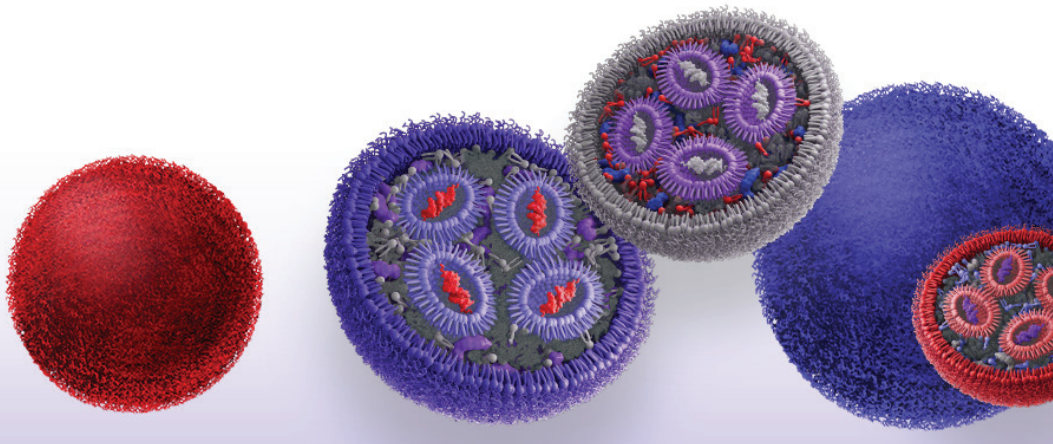
Leveraging over 30 years of experience in lipid-based delivery, we've curated the Vivofectamine Delivery Solutions LNP portfolio. Drawing upon a vast library of more than 5,000 ionizable lipids that were designed with complex multistep organic synthesis to maximize chemical diversity, the LNPs were selected for various applications. They were purposefully chosen through iterative cycles of lipid design, synthesis, formulation optimization, and both *in vitro* and *in vivo* screening for key characteristics like safety, delivery efficiency, and specificity.

Development of Vivofectamine Delivery Solutions

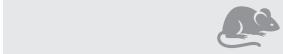


100K+ lipids	**5,000+** ionizable lipids	**2,000+** lipids screened *in vitro*	**300+** lipids screened *in vivo*	**Top 10+** lipids
• **Tens** of patents • **Biodegradable** for safety • **Chemically diverse** ionizable lipid structures	• Successfully **synthesized** at milligram to grams scale	• Forming **stable LNPs** • ***In vitro*** efficiency and safety evaluated	• ***In vivo*** efficacy, organ targeting, and safety tested • Better or comparable to clinical benchmarks	• **Variety of applications** • Detailed biological and biophysical characterization • **Large-animal data**

We are planning to continually expand our ionizable lipid library and related delivery technologies to enable broader applications for Vivofectamine Delivery Solutions.



Vivofectamine Delivery Solutions: Tailored for basic researchers or drug developers

	Basic research portfolio	Drug development portfolio
Your goal	Basic research	Development of prophylactic and cancer vaccines, or protein replacement, protein expression, or genome editing therapies
Offered as	**Catalog products** available at thermofisher.com/vivofectamine	**Custom products and formulation services** offered by the Vivofectamine services team— can be reached at thermofisher.com/vivofectamine
Therapeutic path	Research use only	Research use only for evaluation, with a **path to clinical/commercial licensing and use in therapeutics**
Applications	Vaccine Intramuscular (IM); Liver Intravenous (IV)	Vaccine Intramuscular (IM); Liver Intravenous (IV); Tumor Intratumoral (ITu); Eye Intravitreal (IVT); CNS Intrathecal (IT); Others Contact us.
Model organisms		 

For basic researchers, we offer off-the-shelf, easy-to-use LNP reagents. One of these formulations is optimized for intramuscular mRNA vaccine delivery and the other is optimized for intravenous delivery to the liver.

Both products have demonstrated *in vivo* performance competitive with clinical benchmarks in rodent studies. These reagents are specifically designed with optimized lipid selection and composition tailored for each application. This can help to speed up your research by reducing the time required to find an appropriate LNP reagent to deliver your payload.

For drug developers, we have selected safe and effective ionizable lipids and designed formulations for intramuscular mRNA vaccine delivery and intravenous delivery to the liver. These lipids offer an exceptional safety profile with delivery efficiency competitive with clinical benchmarks in rodents and nonhuman primates (NHPs). We also offer solutions to explore *in vivo* delivery applications for systems such as CNS, eye, and tumors using a local route of delivery for potential nucleic acid therapeutics.

Flexible formats are available to meet your needs. Our drug development portfolio offers individual ionizable lipids to craft your own formulation, custom LNP compositions optimized for specific applications, and LNP formulation services to help accelerate your path to preclinical evaluations.

Adaptive licensing support

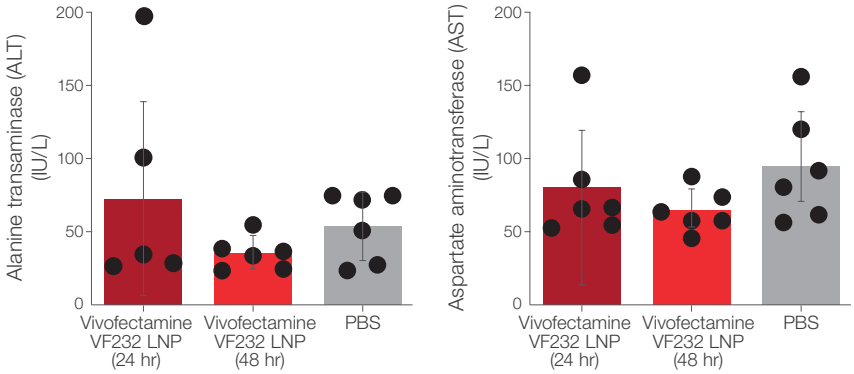
We offer you the flexibility to obtain a license for your chosen lipids for therapeutic use at your convenience. We prioritize tailoring our licenses to fit your unique business needs, providing scalable solutions that evolve with your growth.

Safety | Maximize the window of your payload delivery success

Our solutions are well-characterized in animal models at a broad range of doses. The lipids in our drug development portfolio have been tested in large animals (rats and NHPs), supporting their promise for further clinical development. Our data highlight that lipids in our drug development portfolio are tolerated at high or repeated doses.

Safety in animal studies

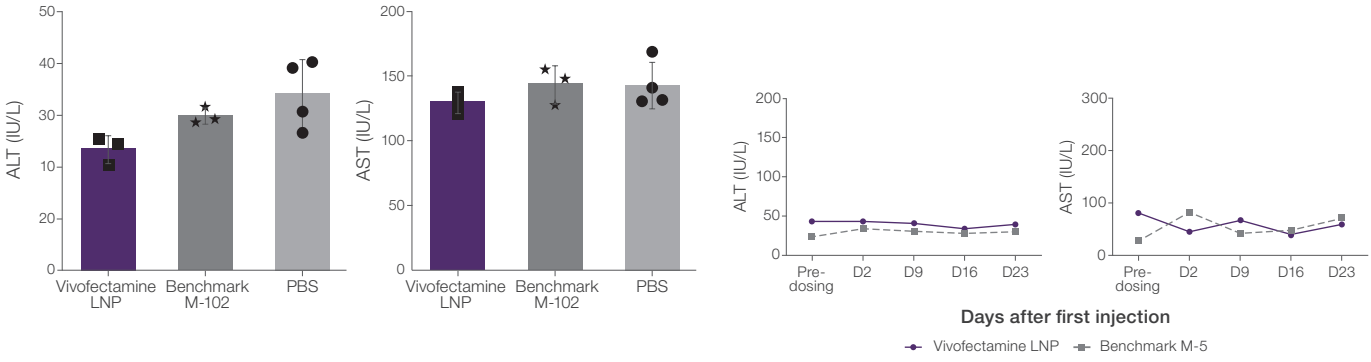
Well-tolerated in mice at 1 mg/kg dose
Liver chemistry, 24 hr and 48 hr after delivery



From the basic research portfolio

Unchanged liver enzyme levels in rats after 5 repeated 400 µg doses
Liver chemistry, 24 hours after 5th weekly dose

Well-tolerated in NHP after 4 repeated 1 mg/kg doses
Liver chemistry, 24 hours after each weekly dose



Collaborator-generated data

From the drug development portfolio

Accelerate your program | Proven *in vivo* delivery solutions

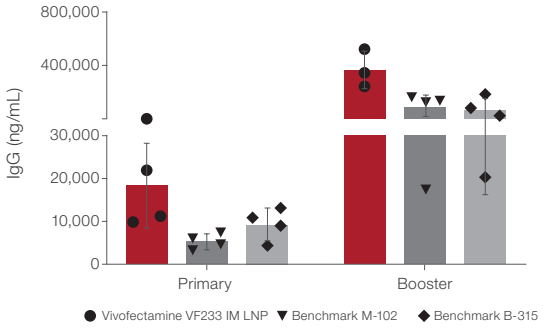
Trust in Vivofectamine Delivery Solutions to expedite your journey. The meticulous selection and comprehensive testing that underpin the development of these LNP technologies help reduce the time and resources often needed to identify the right LNP delivery solutions for your specific payload and application.

Efficacy in animal studies

Vaccine | IM

Immunogenicity on par with clinical benchmarks

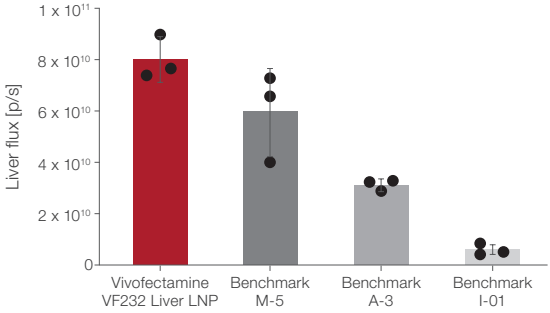
IgG levels after hemagglutinin (HA) mRNA (0.25 mg/kg) immunization; booster dose administered 3 weeks after primary dose



Liver | IV

Liver delivery efficacy equal to or better than clinical benchmarks

4 hours after delivery of firefly luciferase mRNA (0.5 mg/kg)

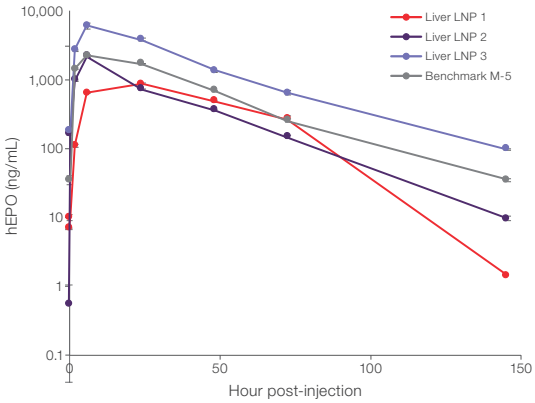


From the basic research portfolio

Liver | IV

Efficient liver delivery on par with clinical benchmarks

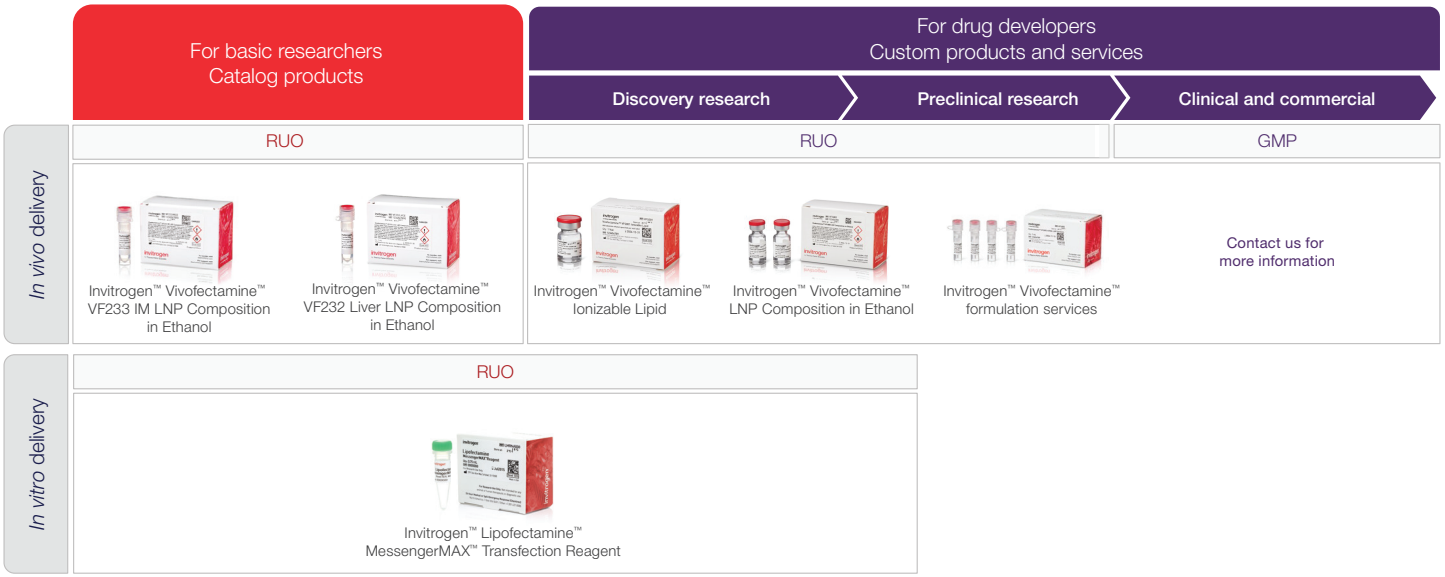
Human erythropoietin (hEPO) levels in NHP serum after delivery of hEPO mRNA (1 mg/kg)



Collaborator-generated data

From the drug development portfolio

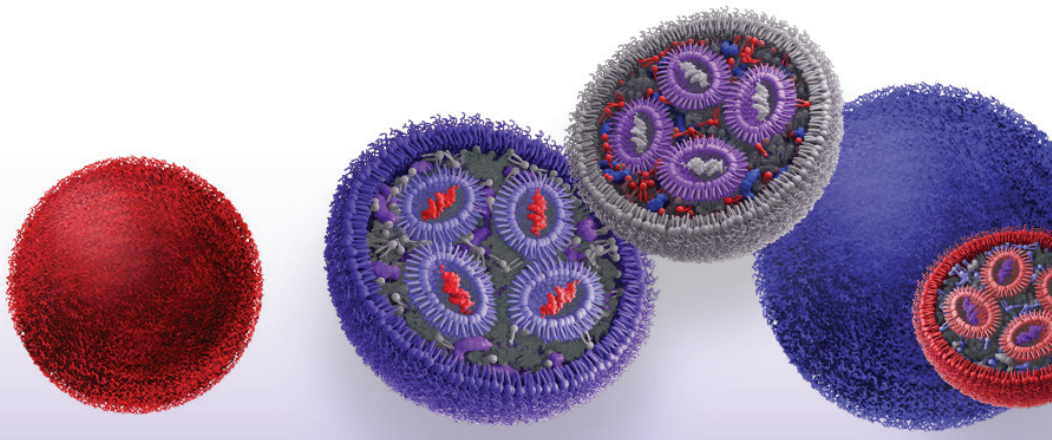
Leverage our extensive Invitrogen™ Lipofectamine™ transfection reagents and Vivofectamine Delivery Solutions to help accelerate your progress. Use Invitrogen™ Lipofectamine™ MessengerMAX™ reagent for *in vitro* mRNA target screening and/or quality control, then utilize Vivofectamine Delivery Solutions for efficient *in vivo* nucleic acid delivery. Whether you're conducting basic research or developing breakthrough medicines, we're here to support your journey.



Stay a step ahead with Vivofectamine Delivery Solutions

Join the growing community of researchers leveraging the power of Vivofectamine Delivery Solutions to enable your innovation. At Thermo Fisher Scientific, we are committed to providing you with high-quality delivery solutions that offer versatility, performance, quality, and licensing flexibility—all designed to help you accelerate your research and drug development timelines.

Embrace the future of advanced nucleic acid delivery with Vivofectamine Delivery Solutions. Get started by scanning the QR code below.



Vivofectamine catalog products for basic researchers

Ordering information

Product	Description	Quantity	Cat. No.
Vivofectamine VF232 Liver LNP Composition in Ethanol	Optimized reagent for intravenous (IV) delivery to liver	1 mL	VF232LVCE or VF232LVCECN*
Vivofectamine VF233 IM LNP Composition in Ethanol	Optimized reagent for intramuscular (IM) delivery for vaccines	1 mL	VF233IMCE or VF233IMCECN*

* For China only.

Vivofectamine custom products and services (RUO) for drug developers

The Vivofectamine Delivery Solutions drug developer portfolio is offered exclusively through our LNP specialists on the Vivofectamine services team who can be reached at thermofisher.com/vivofectamine.

Learn more at **thermofisher.com/vivofectamine**