SARTORIUS

Product Datasheet

in vivo-jetRNA®+

A Ready-to-Use Lipid-Based Nanoparticle Solution for In Vivo and Ex Vivo mRNA Delivery

Product Information

in vivo-jetRNA®+ is a non-viral delivery solution composed of pre-formed lipid-based nanoparticles. It has been specifically developed for in vivo mRNA delivery. Its high delivery efficiency combined with its safety make in vivo-jetRNA®+ an innovative alternative to lipid nanoparticles (LNPs), with the added advantage of being user-friendly with a two-step protocol.

in vivo-jetRNA®+ can be used to deliver mRNA, self-amplifying RNA (saRNA), and guide RNA (gRNA) via systemic or local administration routes in various animal models, making it an ideal tool for scientists developing vaccines, protein replacement therapies, oncology treatment, or working on genome editing. It has also proven highly effective for ex vivo applications, such as the generation of mRNA CAR-T cells.

Features and Benefits

- **Efficient:** Delivery efficiency comparable to LNPs
- **Time-Saving:** Ready-to-use, no equipment or formulation expertise needed
- **Safe:** Low pro-inflammatory effects in animal models
- **Stable:** Efficiency maintained for one month at 4 °C
- **Universal:** mRNA, saRNA, and gRNA delivery via any administration route

Introduction

Relevant Applications

- mRNA vaccines
- mRNA therapeutics
- Protein replacement therapy
- Gene therapy
- Genome editing
- Ex vivo cell therapy
- Proof of concept studies
- Academic research

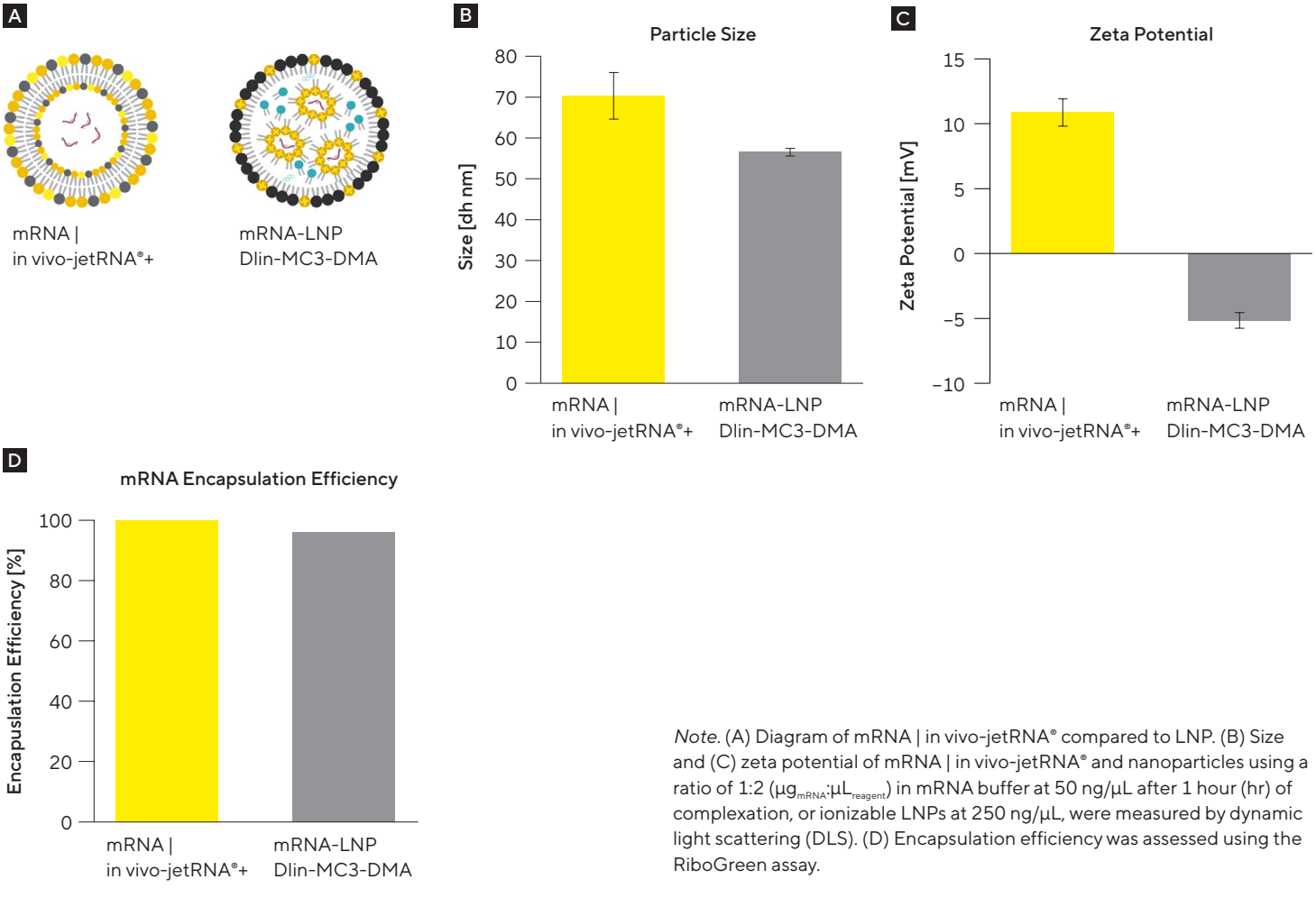
Relevant Process Steps

- mRNA nanoparticles formulation
- Drug product formulation
- Delivery | transfection

Performance

Efficient
in vivo-jetRNA®+ is an optimal reagent for delivering mRNA in vivo due to its ability to protect its payload from ubiquitous endonucleases, prevent non-specific interactions with proteins, and promote efficient cell entry. in vivo-jetRNA®+ has been demonstrated to encapsulate 100% of the mRNA, leading to gene expression comparable to LNPs currently used as the standard for non-viral delivery (Figure 1).

Figure 1: *in vivo-jetRNA®+ Leads to 100% mRNA Encapsulation, Enabling Efficient mRNA Delivery*

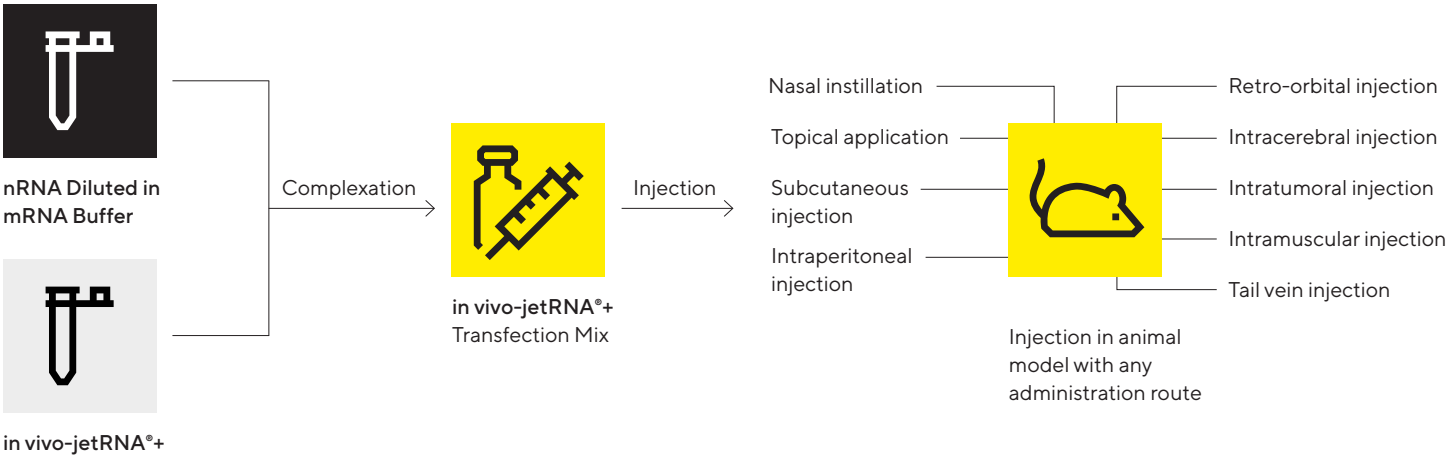


Note. (A) Diagram of mRNA | in vivo-jetRNA® compared to LNP. (B) Size and (C) zeta potential of mRNA | in vivo-jetRNA® and nanoparticles using a ratio of 1:2 (μg_{mRNA}:$\mu L_{reagent}$) in mRNA buffer at 50 ng/µL after 1 hour (hr) of complexation, or ionizable LNPs at 250 ng/µL, were measured by dynamic light scattering (DLS). (D) Encapsulation efficiency was assessed using the RiboGreen assay.

Time-Saving

LNPs are widely used for mRNA delivery, but their optimal formulation requires expertise, months of work, and specific equipment and consumables. With in vivo-jetRNA®+, there is no need to spend time and budget on formulation, as it is a ready-to-use optimized formulation with a simple protocol (Figure 2). mRNA | in vivo-jetRNA®+ lipid-based nanoparticles are prepared in just two steps and ready to use in 15 minutes, with no need for formulation equipment.

Figure 2: *Protocol of in vivo-jetRNA®+ for In Vivo mRNA Delivery*

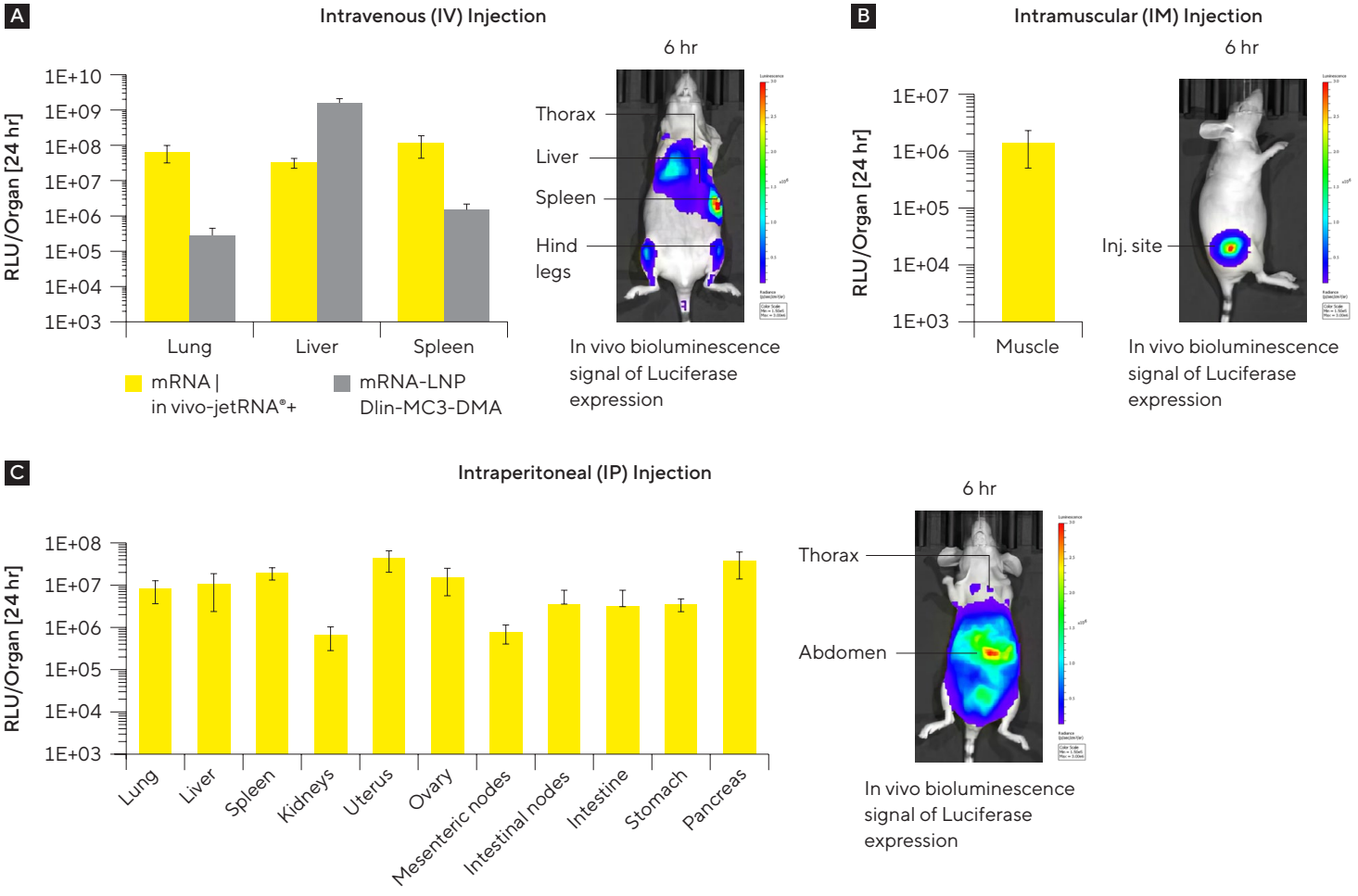


Note. This two-step protocol is suitable for direct injection of mRNA | in vivo-jetRNA®+ nanoparticles by any administration route, local or systemic.

Universal

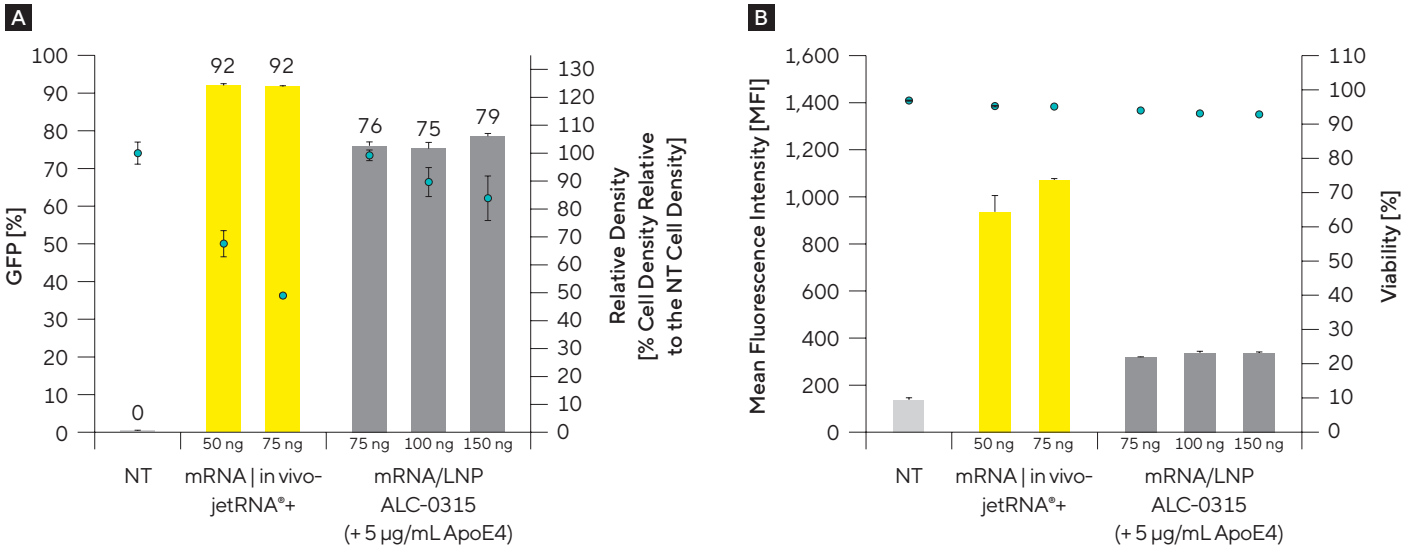
in vivo-jetRNA®+ has been specifically developed for the delivery of mRNA in vivo and is also highly efficient with saRNA and gRNA. It can be administered systemically or locally, allowing scientists to tailor biodistribution to their needs and objectives (Figure 3). In addition, in vivo-jetRNA®+ has also proved highly effective for ex vivo applications, such as the generation of transient mRNA CAR-T cells (Figure 4).

Figure 3: *in vivo-jetRNA®+ Supports to Efficient mRNA Delivery in Different Organs Depending on the Administration Route*



Note. mRNA encoding Luciferase was injected into mice using in vivo-jetRNA®+ through different administration routes: (A) intravenous (IV), (B) intramuscular (IM), and (C) intraperitoneal (IP). Complexes were formed with a mRNA | in vivo-jetRNA®+ ratio of 1:2 (μg_{mRNA}:$\mu L_{reagent}$) in mRNA Buffer using 10 µg mRNA for IV, 5 µg mRNA for IM, and 20 µg mRNA for IP injection. Luciferase expression was assessed 6 and 24 hours post-injection.

Figure 4: *in vivo-jetRNA®+ Supports Very High Ex Vivo Transfection Efficiency of Primary Human T Cells*



Note. mRNA encoding GFP was transfected into primary human T cells using in vivo-jetRNA®+ and ionizable LNPs (based on ALC-0315). Complexes were formed with a mRNA | in vivo-jetRNA®+ ratio of 1:2 (μg_{mRNA}:$\mu L_{reagent}$) in mRNA Buffer using 50 or 75 ng mRNA or with ALC-0315-LNPs (coated with 5 µg/mL ApoE4) using 75, 100, or 150 ng mRNA for 187,500 activated primary T cells in 67.5 µL of X-VIVO™ 15 (Lonza) in a 96-well plate. A further 175 µL was added after 4 hours. GFP expression, relative cell density, mean fluorescence intensity and viability were assessed 24 hours post-transfection .

Technical Specifications

Attribute	in vivo-jetRNA®+ 1 mL
Quality grade	Research grade
Type	Pre-formed lipid-based nanoparticle solution
Volume	1 mL
Container	Polypropylene vial
Storage	5 ± 3°C. Do not freeze
Expiry date	Indicated in the certificate of analysis and on the product
Provided with	mRNA buffer (60 mL bottle)
Number of injections	Sufficient for 25 to 50 intravenous injections or 50 to 100 intramuscular injections in mice

Ordering Information

Item	Description	Volume	Order Number
in vivo-jetRNA®+ 1 mL	One 1 mL vial of in vivo-jetRNA®+ reagent supplied with one 60 mL bottle of mRNA buffer	1 mL vial (+ 60 mL mRNA buffer bottle)	101000122

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sartorius.com/transfection-reagents-plasmids

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