

Lipid Nanoparticle (SV102-Delivery™) R&D Kit

For human T cell specific delivery of mRNA

Catalog number: SV102-G

Table 1 Product contents

Cat. No.	Vol. or Wt.	Storage	Required materials not supplied
SVD-1	3 x 0.3 mL	-80 °C	•RNase-free water
SVD-2	1 x 1.5 mL	R.T.	•RNase-free PBS
SVD-3	1 x 3 mg	-80 °C	•RNase-free filter pipette
SVD-4-B2	1 x 0.4 mL	2-8 °C	•RNase-free microcentrifuge tubes
Materials supplied for encapsulating 36 µg of mRNA			•Purification tube
			•Cell Culture media
			•Cytokines

Preparations of Reagents before use (!)

- Lipid Mixture (SVD-1): This lipid mixture stock solution should be stored at -80 °C for long-term use.
- Lipid mixture (SVD-1), formulation buffer (SVD-2), and reagent A (SVD-3): Allow these reagents to reach room temperature prior to use.
- Reagent A (SVD-3): Add 1 mL of RNase free water to make a 10X stock solution (3 mg/mL). Aliquot 200 µL for each and store at -80 °C. Avoid freeze-thaw cycle. Dilute 10-fold with water to 1X before use.
- Reagent B2 (SVD-4-B2): Do not freeze!** Avoid freeze-thaw cycle.

Note: For preparation of human PBMCs, please follow the manufacturer's protocol for the PBMC isolation kit (Stemcell Technologies or the instructions of other similar PBMC isolations kits).

Warranty and limitation

The buyer agrees to purchase the kit containing materials to SunVax mRNA Therapeutics' Terms and Conditions.

Prior to use, the Buyer is responsible for requesting and reviewing the Complete Terms and Conditions including details of Warranty and Limitation of Liability, via SunVax mRNA Therapeutics website.

This document is copyrighted by SunVax mRNA Therapeutics. All rights reserved. This document could not, in whole or in part, be copied, photocopied, translated, or reduced to any electronic medium or machine-readable form without prior consent, in writing, from SunVax mRNA Therapeutics.

@2025, SunVax mRNA Therapeutics

48 Dunham Rd #4400 Beverly, MA 01915

All rights reserved. Printed in U.S.A. -May 12, 2025

If you need large volumes of the cell type specific LNP-mRNA, please contact SunVax_Customer@sunvaxmRNA.com.

Protocol for Lipid Nanoparticle (SV102-Delivery™) R&D kit

- In a 1.5 mL RNase-free microcentrifuge tube, dilute 4 µg of mRNA (e.g., eGFP mRNA) in 100 µL of formulation buffer (SVD-2, prewarmed to R.T.). Mix thoroughly by pipetting up and down at least 5 times. Briefly centrifuge if there are bubbles.
- Transfer 100 µL of the lipid mixture (SVD-1, prewarmed to R.T.) into a 1.5 mL RNase-free microcentrifuge tube.
- Add 100 µL mRNA solution (in formulation buffer) into the 100 µL lipid mixture under vortex (2000 RPM) mixing in 10 seconds and incubate at 37 °C for 5 minutes (See the video below).
<https://www.youtube.com/watch?v=PNp7Vvuu8jg>
- In a 1.5 mL RNase-free microcentrifuge tube, add 40 µL of Reagent B2 (SVD-4-B2) stock solution. Add 4 µL of 1X Reagent A (SVD-3) stock solution and mix by pipetting up and down 5-10 times. Incubate in a 37 °C water bath for 1 hour. After incubation, keep the A-B solution at room temperature until use. Note: The A-B solution must be used within 3 hours.
- Add the entire volume (200 µL) of LNP-mRNA mixture (step 3) to the A-B solution. Mix by pipetting up and down 5-10 times. Incubate the mixture on a shaker (300 rpm) at room temperature for 1 hour.
- Add 156 µL of PBS and gently mix by pipetting 3-5 times, store at 4 °C until use. **Note: It should be used in 24 hours.**
- Transfer 10 µL, 40 µL, 80 µL, 160 µL (~100, 400, 800, 1,600 ng) of the final LNP-mRNA stock solution into each well of 96-, 24-, 12-, 6-well plate containing 0.1 X10⁶, 0.5 X10⁶, 1.0 X10⁶, 2.5 X10⁶ human PBMC cells.

Notes

- Please maintain sterile and RNase free conditions at each step.
- The vortex speed should be around 2000 RPM.
- Please ensure that the lipid mixture (SVD-1) is not subjected to more than two freeze-thaw cycles to maintain its performance.

Warnings

This product is for research use only. Reverse engineering, patent filing, resale, or any other form of commercialization is strictly prohibited. Any intended commercial use of this kit must be authorized in advance by SUNVAX MRNA Therapeutics.

Human T cell targeted SV102 Delivery™ Kits information and Supporting Data

Table 2 The Characterizations of human T cell targeted LNP-mRNA generated by SV102 Delivery™ Kits

LNP-mRNA	EE (%)	Size (nm)	PDI
SV102 Delivery™	96.5±1.7	94.3±1.4	0.18±0.01

The kits exhibit excellent encapsulation efficiency, generate nanoparticles with a uniform average size of approximately 100 nm, and maintain a low polydispersity index (PDI).

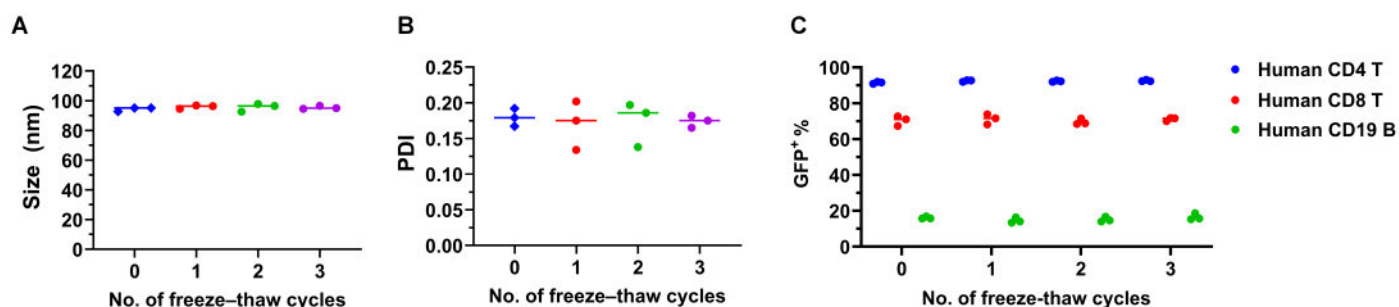


Figure 1. Stability of human T cell targeted LNP-mRNA generated by SV102 Delivery™ Kits. The human T cell targeted LNP-mRNA underwent three freeze-thaw cycles prior to transfect human PBMC cells. Shown are nanoparticle size (A), polydispersity index (PDI) (B), and transfection efficiency in human PBMC cells (C).

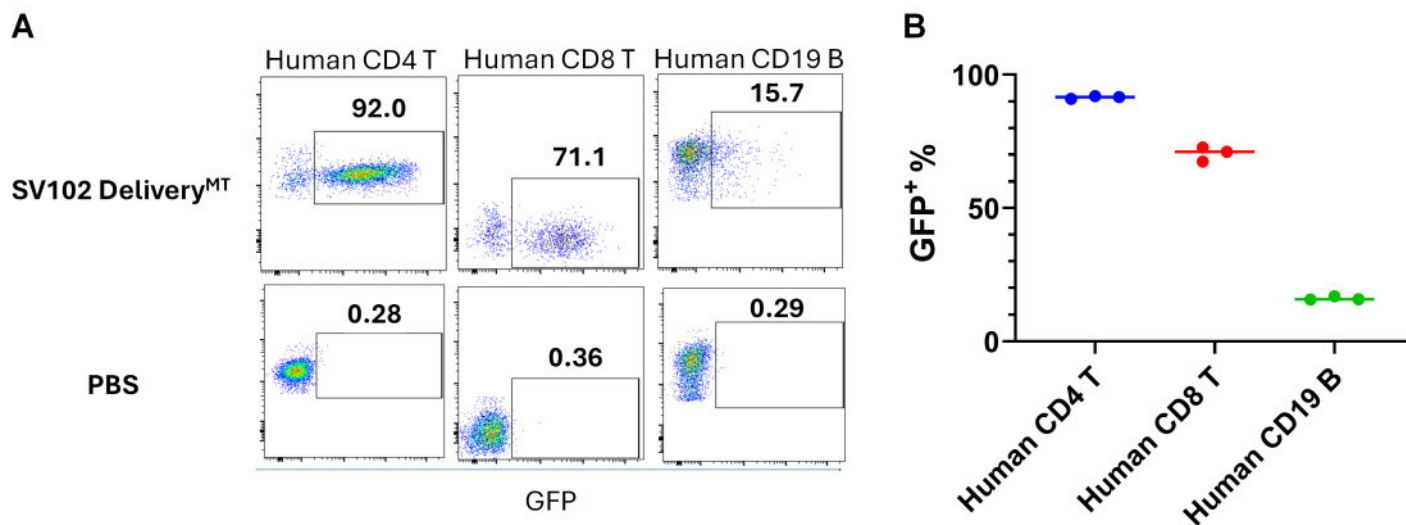


Figure 2. The SV102 Delivery™ kit demonstrated robust transfection efficiency and cell-type specificity in human PBMC cells. *In vitro* transfection efficacy: Human PBMC cells were transfected with LNP-mRNA encoding eGFP, formulated using the SV102 Delivery™ kit as indicated. Shown are representative FACS plots (A) and the percentage of GFP+ cells (B) one day post-transfection, as determined by flow cytometry.