DC68057 | Lipid Trp-L1-T4

Instructions for Use

Trp-L1-T4 is an L-tryptophan-derived ionizable lipid selected as the core lipid in the study's TLNP platform for self-amplifying RNA delivery to follicular helper T cells. The base TLNP formulation produced 59.8% GFP-positive primary Tfh cells under the reported in vitro conditions. In targeted variants, the authors combined CXCR5-antibody functionalization, Tfh-restricted RNA translation and, for in vivo work, Tween-20 modification to generate regulatory CAR-Tfh cells and evaluate a preclinical autoimmune-hepatitis model. These outcomes depend on the complete formulation, targeting ligand, RNA design and study conditions. All formulation and performance information shown below is literature-derived evidence, not a product specification or a guarantee of reproducible LNP performance.

Product information

CAS No.	Not available
Chemical Name	Lipid Trp-L1-T4
Formula	C41H74N4O
M.Wt	639.07
Purity	>95% by ELSD-HPLC
Storage	Original product: up to 1 year under the storage conditions stated on the vial, kept tightly sealed. Stock solutions: aliquots at -20°C, generally up to one month.
Shipping condition	Ships from Shanghai. Pure lipid is stable during ice-pack transport.

Formulation & study context

Literature values apply to the cited study only. Administration routes describe research, not clinical instructions.

Component	Reported molar ratio	Role
Trp-L1-T4	25	Ionizable lipid
Cholesterol	20	Sterol
DMG-PEG2000	0.5	PEG lipid
DOPE	10	Helper phospholipid
Reported ratio sum	55.5	Original ratio retained

N/P ratio	Not reported in the cited article
Total lipid:cargo weight ratio	10:1 ionizable lipid:saRNA (w/w) in the main text; Supplementary Figure S1D labels the optimized axis as total lipids:mRNA, creating a terminology ambiguity
Buffer & pH	10 mM citrate aqueous phase, pH 3; post-mixing dialysis against PBS

Cargo	GFP self-amplifying RNA (saRNA)
Administration route	In vitro Tfh-cell transfection for the lead TLNP result; targeted therapeutic variants were given intravenously
Dose	80 ng GFP-saRNA per 50,000 Tfh cells
Animal model	Primary mouse follicular helper T cells for lead screening
Formulation process	Staggered-herringbone microfluidic mixing at 3:1 aqueous:ethanol flow-rate ratio; 2 h dialysis through a 10 kDa membrane, concentration with a 100 kDa filter and 0.22-micrometer filtration; stored at 4 degrees C.

N/P is a nitrogen-to-phosphate molar ratio. Lipid:cargo mass ratio is a different quantity and must not be used as N/P.

Stock-solution preparation table

Calculated using product-page MW: 639.07 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	15.648 mL	3.130 mL	1.565 mL
25 mg	39.119 mL	7.824 mL	3.912 mL
50 mg	78.239 mL	15.648 mL	7.824 mL
100 mg	156.477 mL	31.295 mL	15.648 mL
250 mg	391.193 mL	78.239 mL	39.119 mL

Volume (mL) = mass (mg) × 1000 / [MW (g/mol) × concentration (mM)]. Mathematical conversions only; not measured solubility. Confirm solvent compatibility and the exact material before preparation.

Handling & storage

Provided that storage conditions are as stated on the product vial and the vial is kept tightly sealed, the product can be stored for up to 1 year.

Wherever possible, prepare and use solutions on the same day. If stock solutions must be prepared in advance, store them as aliquots in tightly sealed vials at -20°C. Generally, these will be usable for up to one month.

Before use, and prior to opening the vial, allow the product to equilibrate to room temperature for at least 1 hour.

References

Cited literature for this formulation and performance dataset Zheng Z, Liu Y, Wang G, et al. In vivo CAR-Tfh cell reprogramming restores tolerance in a mouse model of autoimmune hepatitis. Cell Stem Cell. 2026;33:589-604. DOI: 10.1016/j.stem.2026.02.006 Structure and lead selection: main Figure 1 and Supplementary Figure S1; base formulation: main text and Supplementary Table S1; preparation: STAR Methods; particle properties: Supplementary Table S2; targeted CAR-Tfh performance and mouse AIH-II studies: main Figures 2-7 and Supplementary Figures S2-S7.