DC60711 | CL15F 9-5

Instructions for Use

CL15F 9-5, a piperidine-based ionizable lipid, exhibits favorable properties for mRNA delivery in lipid nanoparticles (LNPs). Its apparent pKa ranges between 6.24–7.15, ideal for mRNA encapsulation and endosomal escape. LNPs formulated with CL15F 9-5 (50:38.5:10:1.5 molar ratio of ionizable lipid:cholesterol:DSPC:DMG-PEG2k) demonstrated high mRNA encapsulation efficiency (>90%) and maintained physicochemical stability (size, PDI, zeta potential) during storage at 4°C for 5 months . In vitro, CL15F 9-5 LNPs showed superior luciferase expression in HEK-293T cells compared to CL4F-based LNPs. In vivo, liver-targeted LNPs delivered hEPO mRNA effectively, with sustained serum hEPO levels post-storage. Intravenous administration of FLuc mRNA-loaded CL15F 9-5 LNPs yielded strong hepatic bioluminescence, confirming liver tropism. As a vaccine candidate, CL15F 9-5 induced robust antigen-specific cellular immunity in mice, with a 14-fold increase in IFN-γ spots compared to SM-102. Its enhanced stability is attributed to reduced aldehyde impurities, minimizing mRNA-lipid adduct formation.

Product information

CAS No.	Not available
Chemical Name	CL15F 9-5
Formula	C56H107NO7
M.Wt	906.468
Purity	ELSD-HPLC>95%
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.

A complete product-specific formulation has not been verified. No standard ratio is substituted.

N/P ratio	Not reported in the verified record
Cargo	Not available in the verified record
Administration route	Not available in the verified record
Animal model	Not available in the verified record
Formulation process	Not available in the verified record

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: 906.468 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	11.032 mL	2.206 mL	1.103 mL
25 mg	27.580 mL	5.516 mL	2.758 mL
50 mg	55.159 mL	11.032 mL	5.516 mL
100 mg	110.318 mL	22.064 mL	11.032 mL
250 mg	275.796 mL	55.159 mL	27.580 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

Overcoming thermostability challenges in mRNA–lipid nanoparticle systems with piperidine-based ionizable lipids
Kazuki Hashiba 1Yusuke Sato. Commun Biol. 2024 May 10;7:556. doi: 10.1038/s42003-024-06235-0