

DC67569 | Lipid S4

Instructions for Use

Lipid S4 is an advanced ionizable lipid engineered for systemic mRNA delivery to the brain, leveraging SR-57227—a high-affinity 5-HT3 receptor ligand—as its core head group to enable targeted blood-brain barrier (BBB) penetration via receptor-mediated transcytosis, while incorporating amino linkers for pH-responsive ionization and biodegradable branched ester tails to facilitate efficient endosomal escape and intracellular mRNA release; optimized through orthogonal screening into OS4 LNP (formulated at S4/DOPE/Chol/DMG-PEG2k = 40:40:60:0.75 molar ratio), it demonstrated a 13.3-fold increase in brain mRNA expression compared to FDA-approved MC3 LNPs, and further conjugation with the Tat cell-penetrating peptide yielded OS4T LNP, boosting delivery efficiency by 12.7-fold over OS4 alone and enabling broad mRNA expression across neurons, astrocytes, microglia, and endothelial cells; validated in orthotopic glioblastoma models, OS4T delivered engineered IL-12 mRNA, suppressing tumor growth and extending median survival to 37 days (vs. 17 days for controls) with minimal systemic toxicity, positioning S4-based LNPs as a robust, translatable platform for CNS-targeted therapeutics.

Product information

CAS No.	Not available
Chemical Name	Lipid S4
Formula	C50H88N4O5
M.Wt	861.65
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: 861.65 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	11.606 mL	2.321 mL	1.161 mL
25 mg	29.014 mL	5.803 mL	2.901 mL
50 mg	58.028 mL	11.606 mL	5.803 mL
100 mg	116.056 mL	23.211 mL	11.606 mL
250 mg	290.141 mL	58.028 mL	29.014 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

Lipid nanoparticles for mRNA delivery in brain via systemic administration-
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