

DC67657 | Lipid TS41

Instructions for Use

TS41 is a trisulfide-derived ionizable lipid engineered for lipid nanoparticles (LNPs) to deliver mRNA therapeutics against multidrug-resistant bacterial pneumonia. Its optimized formulation, TS41S LNP, combines TS41 with helper lipids (e.g., DOPE, cholesterol) at a precise ratio, achieving a hydrodynamic diameter of ~105 nm, low polydispersity, and high mRNA encapsulation efficiency (~84%). This design enables efficient pulmonary delivery via intratracheal administration, with luminescence signals in lungs 4.8-fold higher than clinical benchmarks like SM-102 LNPs, ensuring targeted expression in epithelial cells, macrophages, and neutrophils. Crucially, TS41 LNPs exhibit potent anti-inflammatory properties by scavenging reactive oxygen species (ROS), reducing neutrophil infiltration and proinflammatory cytokines (e.g., IL-6, TNF- α) in infected lungs. In preclinical models, TS41S LNP encoding PB9 peptibody mRNA eradicated pathogens like *Staphylococcus aureus* and *Pseudomonas aeruginosa*, improved survival rates to 80%, and minimized tissue damage without systemic toxicity. Its ROS-scavenging capability synergizes with antibacterial effects, offering a promising, translatable platform for combating resistant infections while controlling inflammation. Future enhancements, such as codon optimization or inhalation delivery, could further broaden its therapeutic potential.

Product information

CAS No.	Not available
Chemical Name	Lipid TS41
Formula	C67H131O8N3S12
M.Wt	1,491.52
Purity	>98%
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: 1491.52 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	6.705 mL	1.341 mL	0.670 mL
25 mg	16.761 mL	3.352 mL	1.676 mL
50 mg	33.523 mL	6.705 mL	3.352 mL
100 mg	67.046 mL	13.409 mL	6.705 mL
250 mg	167.614 mL	33.523 mL	16.761 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

Not available