

DC67990 | 4A3-LNSC8

Instructions for Use

4A3-LNSC8 is a strategically designed thiourea-functionalized ionizable lipid that serves as the foundational core for a novel anion-coordination delivery platform. Its structure features a central 4A3 amine headgroup symmetrically extended with four hydrophobic tails, each incorporating a biodegradable ester linkage and a key thiourea-bridged linker. The inclusion of the thiourea group is the pivotal innovation, as it provides specific hydrogen-bonding sites capable of interacting with various halide anions (F^- , Cl^- , I^-). When formulated into lipid nanoparticles (LNPs) without anion coordination, 4A3-LNSC8 itself exhibits a characteristic liver tropism, efficiently delivering mRNA to hepatocytes following systemic administration, with a measured surface pKa of approximately 5.54. However, its primary significance lies in its role as a versatile precursor. The strong anion-binding capability of its thiourea linkers allows for predictable modulation of the LNP's properties. Upon binding with anions like Cl^- , the resulting complex (e.g., Cl^- -4A3-LNSC8) undergoes a significant pKa shift, which reprograms the LNP's in vivo fate, redirecting mRNA delivery from the liver to secondary lymphoid organs such as the spleen and lymph nodes. Thus, 4A3-LNSC8 is not merely an efficient ionizable lipid but a programmable scaffold that enables precise control over organ-targeting specificity through simple anion coordination, offering a powerful rational design strategy for advanced mRNA therapeutics.

Product information

CAS No.	Not available
Chemical Name	4A3-LNSC8
Formula	C87H163O16N11S8
M.Wt	1,875.80
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: 1875.8 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	5.331 mL	1.066 mL	0.533 mL
25 mg	13.328 mL	2.666 mL	1.333 mL
50 mg	26.655 mL	5.331 mL	2.666 mL
100 mg	53.311 mL	10.662 mL	5.331 mL
250 mg	133.276 mL	26.655 mL	13.328 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