

DC67989 | CI-4A3-LNSC8

Instructions for Use

CI-4A3-LNSC8 represents a novel class of thiourea-functionalized ionizable lipids engineered for selective organ-targeted mRNA delivery. Its core innovation lies in an anion-coordination strategy, where the parent lipid, 4A3-LNSC8, binds chloride ions (Cl⁻) via hydrogen-bonding interactions with its thiourea groups. This binding event is not merely structural but functionally critical, as it induces a significant shift in the surface pKa of the resulting lipid nanoparticles (LNPs) from approximately 5.54 to 8.79. This pKa modulation is the key mechanism that redirects the organotropism of the LNPs upon systemic administration. While the unmodified 4A3-LNSC8 LNPs preferentially deliver mRNA to the liver, CI-4A3-LNSC8 LNPs effectively reprogram this tropism, enabling highly efficient mRNA delivery to secondary lymphoid organs (SLOs), particularly the spleen and lymph nodes. This platform demonstrates remarkable efficacy, achieving up to 65.7% gene editing efficiency in splenic macrophages in vivo, significantly outperforming benchmark delivery systems. Furthermore, by leveraging the coordination with different halides, such as iodine for computed tomography (CT) contrast, the system can be adapted for dual-modal theranostic applications, enabling simultaneous lymphatic metastasis imaging and therapeutic mRNA delivery.

Product information

CAS No.	Not available
Chemical Name	CI-4A3-LNSC8
Formula	C87H163O16ClN11S8-
M.Wt	1,911.25
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: 1911.25 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	5.232 mL	1.046 mL	0.523 mL
25 mg	13.080 mL	2.616 mL	1.308 mL
50 mg	26.161 mL	5.232 mL	2.616 mL
100 mg	52.322 mL	10.464 mL	5.232 mL
250 mg	130.804 mL	26.161 mL	13.080 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