

DC60855 | 4A3-SC7

Instructions for Use

4A3-SC7 is a proprietary, ionizable lipid component central to the SORT LNP platform developed for targeted organ delivery. It features a unique branched-tail structure designed to enhance mRNA encapsulation and endosomal escape. In the study, it served as the primary ionizable lipid in both Liver SORT LNPs and updated Lung SORT LNPs. For liver targeting, it was formulated at 15.04 mol% alongside helper lipids (DOPE: 23.04%, Cholesterol: 38.72%), PEG-lipid (DMG-PEG2000: 3.2%), and the liver-targeting lipid 4A3-Cit (20 mol%). This specific composition (Total lipid:RNA = 20:1 wt/wt) yielded LNPs with ~74 nm size, low PDI (0.17), and high encapsulation efficiency (87%) for large mRNAs like ABE editors (~5000 nt). Its branched-tail architecture was critical for stabilizing nanoparticles encapsulating large RNAs, overcoming a key limitation of previous formulations. 4A3-SC7-based Liver SORT LNPs enabled >40% base editing in hepatocytes in vivo, achieving durable correction of the disease-causing SERPINA1 mutation in PiZ mice and significantly reducing pathological protein aggregates. In the updated DualSORT system, 4A3-SC7 was also paired with DORI (instead of DOTAP) for improved lung targeting, demonstrating its versatility as a foundational ionizable lipid for multi-organ gene editing therapeutics.

Product information

CAS No.	Not available
Chemical Name	4A3-SC7
Formula	C71H131N3O16S4
M.Wt	1,411.07
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: 1411.07 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	7.087 mL	1.417 mL	0.709 mL
25 mg	17.717 mL	3.543 mL	1.772 mL
50 mg	35.434 mL	7.087 mL	3.543 mL
100 mg	70.868 mL	14.174 mL	7.087 mL
250 mg	177.171 mL	35.434 mL	17.717 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

Dual SORT LNPs for multi-organ base editing-June 2025 Nature Biotechnology-Minjeong Kim¹, Daniel J. Siegwart .etl