

DC67314 | Lipid AA2

Instructions for Use

AA2 lipid is an innovative amino alcohol-derived ionizable lipid designed for optimized mRNA delivery. Its unique structure includes a hydroxyl-containing headgroup that enhances mRNA binding through hydrogen bonds and a branched ester tail (R2) that promotes a cone-shaped architecture, facilitating efficient endosomal escape. Formulated into lipid nanoparticles (LNPs) with a size of 108.6 ± 3.7 nm and a polydispersity index (PDI) below 0.3, AA2 achieves high mRNA encapsulation efficiency ($89.0 \pm 1.4\%$) and an ideal pKa of approximately 6.2, ensuring effective endosomal release. In vivo studies demonstrate that AA2 LNP-encapsulated spike mRNA elicits 4.7-fold higher IgG titers and robust CD8+ T-cell responses (characterized by IFN- γ +, TNF- α +, and granzyme B+ markers) compared to SM-102/ALC-0315 LNPs. Notably, AA2 exhibits minimal off-target accumulation, with low biodistribution in the liver and spleen. Its slightly positive surface charge (+3–5 mV) enhances cellular uptake, while the biodegradable ester structure ensures metabolic clearance, reducing potential toxicity.

Product information

CAS No.	Not available
Chemical Name	Lipid AA2
Formula	C ₅₆ H ₁₁₀ O ₇ N ₂
M.Wt	923.50
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: 923.5 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	10.828 mL	2.166 mL	1.083 mL
25 mg	27.071 mL	5.414 mL	2.707 mL
50 mg	54.142 mL	10.828 mL	5.414 mL
100 mg	108.284 mL	21.657 mL	10.828 mL
250 mg	270.709 mL	54.142 mL	27.071 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

LNP-RNA-mediated antigen presentation leverages SARS-CoV-2-specific immunity for cancer treatment
Y Xue, X Hou, Y Zhong, Y Zhang, S Du, DD Kang... - Nature Communications, 2025