

DC60978 | C12-2aN

Instructions for Use

C12-2aN is a crosslinked ionizable lipid developed for mRNA vaccine delivery and dendritic-cell metabolic reprogramming. Its structure combines two piperazine-based ionizable amine cores, a bis-amidine crosslinker, and four hydroxylated C12 hydrophobic tails. When formulated with DOPE, cholesterol, and C14-PEG2000, C12-2aN LNPs enhanced mRNA endosomal escape and activated AMPK-mTORC2-dependent glycolysis, supporting dendritic-cell maturation and antigen presentation. In preclinical mouse studies, C12-2aN LNPs generated robust humoral and cellular immune responses in SARS-CoV-2 RBD and OVA cancer-vaccine models. The formulation also demonstrated reduced liver-associated off-target expression and lower acute inflammatory markers than the tested control formulations. C12-2aN is a preclinical research lipid intended for evaluating metabolically active mRNA vaccine delivery systems.

Product information

CAS No.	Not available
Chemical Name	C12-2aN
Formula	C ₇₄ H ₁₅₂ N ₁₀ O ₄
M.Wt	1,246.0960
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: 1246.096 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	8.025 mL	1.605 mL	0.803 mL
25 mg	20.063 mL	4.013 mL	2.006 mL
50 mg	40.125 mL	8.025 mL	4.013 mL
100 mg	80.251 mL	16.050 mL	8.025 mL
250 mg	200.627 mL	40.125 mL	20.063 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

Kim D, Gong N, Alameh M-G, Han EL, Wang H, Wang J, Feng E, Yoon I-C, Murray AM, Shi Q, Moon S-J, Mrksich K, Weissman D, Mitchell MJ. Crosslinked ionizable lipids reprogram dendritic cell metabolism for potent mRNA vaccination. Nature Materials. 2026.