DC68216 | Lipid CA2d

Instructions for Use

CA2d is an ionizable lipid developed for systemic mRNA delivery to the central nervous system. Its architecture combines an MK-0752-derived CNS-accessing moiety, a short three-carbon diamine spacer, a tertiary ionizable amine, and two acetal-containing hydrophobic tails. When formulated with DOPE, cholesterol and DMG-PEG2000, CA2d LNPs crossed the blood-brain barrier through caveolae- and γ-secretase-associated transcytosis and delivered mRNA to neurons, astrocytes, microglia and brain endothelial cells. Following intravenous administration of FLuc mRNA at 0.5 mg/kg in mice, CA2d produced 16.6-fold higher brain expression than MC3 and 8.6-fold higher expression than SM-102 at 6 hours. CA2d was further evaluated in repeated brain-cell transfection studies, a pilot rhesus macaque experiment and a tPA-modified TGF-β1 mRNA formulation for ischemic stroke. These results support CA2d as a promising preclinical research lipid for investigating non-viral CNS mRNA delivery; it has not been clinically validated.

Product information

CAS No.	Not available
Chemical Name	Lipid CA2d
Formula	Not available
M.Wt	Not available
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: not available g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	MW unavailable	MW unavailable	MW unavailable
25 mg	MW unavailable	MW unavailable	MW unavailable
50 mg	MW unavailable	MW unavailable	MW unavailable
100 mg	MW unavailable	MW unavailable	MW unavailable
250 mg	MW unavailable	MW unavailable	MW unavailable

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

Wang S, Zhong Y, Wang C, Tian M, Bennett JL, Bliss-Moreau E, Xue Y, Yu C, Hou X, Zheng YY, Li H, Liu Z, Cao D, Kang DD, Deng B, Dong Y. Overcoming the blood-brain barrier using central nervous system-accessing lipid nanoparticles for enhanced mRNA therapeutics. Proc Natl Acad Sci U S A. 2026 Aug 18;123(33):e2538147123. doi: 10.1073/pnas.2538147123. Epub 2026 Aug 14. PMID: 42599788.