DC67295 | Lipid MK16

Instructions for Use

MK16 is an MK-0752-derived ionizable lipid developed for blood-brain-barrier-crossing mRNA delivery in preclinical mouse models. In the cited MK16 BLNP formulation, the authors reported an apparent LNP pKa of 6.86, a particle diameter of 137.0 ± 4.1 nm, 84.8 ± 1.5% mRNA encapsulation, and brain FLuc expression 8.3-fold above an MC3 LNP comparator after intravenous administration. The study also reported mRNA expression in neurons, astrocytes, brain capillary endothelial cells and microglia, as well as proof-of-concept results in cocaine-conditioned-place-preference and orthotopic glioblastoma models. All formulation and performance information shown below is literature-derived study evidence, not a product specification or a guarantee of reproducible LNP performance.

Product information

CAS No.	Not available
Chemical Name	Lipid MK16
Formula	C55H91ClF2N2O7S
M.Wt	997.84
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.

Component	Reported molar ratio	Role
MK16	60	Ionizable lipid
DOPE	30	Helper phospholipid
Cholesterol	40	Sterol
DMG-PEG2k	0.75	PEG lipid
Reported ratio sum	130.75	Original ratio retained
N/P ratio	Not reported in the cited article	
Total lipid:cargo weight ratio	12.5:1 MK16:mRNA (w/w); this is not an N/P ratio	
Buffer & pH	Not reported in the cited article or supplied methods	
Cargo	Firefly luciferase (FLuc) mRNA	

Administration route	Intravenous tail-vein injection
Dose	0.5 mg mRNA/kg, single dose
Animal model	C57BL/6J mice
Formulation process	Lipids in an ethanol phase and mRNA in an aqueous phase; the cited article refers to a previously published method and does not report the device, flow rates, buffer exchange or final formulation buffer

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: 997.84 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	10.022 mL	2.004 mL	1.002 mL
25 mg	25.054 mL	5.011 mL	2.505 mL
50 mg	50.108 mL	10.022 mL	5.011 mL
100 mg	100.216 mL	20.043 mL	10.022 mL
250 mg	250.541 mL	50.108 mL	25.054 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

Cited literature for this formulation and performance dataset Wang C, Xue Y, Markovic T, et al. Blood-brain-barrier-crossing lipid nanoparticles for mRNA delivery to the central nervous system. Nature Materials. 2025;24:1653-1663. DOI: 10.1038/s41563-024-02114-5 Structure: Figure 3c and Supplementary Scheme S2; exact pKa: Supplementary Figure 6d; optimized composition: main text p. 1654; particle properties and biodistribution: main text p. 1656 and Supplementary Figures 8-10; cellular delivery: main text pp. 1657-1658; disease-model findings: Figures 5-6.