

DC60841 | Lipid F11T6

Instructions for Use

F11T6 is a next-generation lipid nanoparticle (LNP) optimized for ultra-efficient neuron-targeted mRNA delivery, featuring a dual-tetrahydrofuran (THF) core and four pH-responsive acetal tails. Its unique bis-THF architecture enhances lipid bilayer stability and promotes brain-specific biodistribution, achieving 16.4% GFP+ neurons in vivo—the highest reported among CNS-targeting LNPs. Cryo-EM reveals a compact spherical structure ($\varnothing \sim 150$ nm) with 93.2% mRNA encapsulation efficiency, while THF-acetal synergy enables rapid endosomal escape (Pearson coefficient: 0.16 vs. 0.27 for F10T5). Preclinical studies show F11T6 leverages meningeal lymphatic transport for brain accumulation, yielding 13.0% neuron-specific tdTomato expression in Ai14 mice, surpassing F10T5 (8.93%) and SM102 (0.1%). Mechanistically, the dual-THF core strengthens interactions with lipoprotein receptors on brain endothelial cells, whereas acetal tails undergo acid-triggered hydrolysis in endosomes, releasing mRNA into the cytoplasm. Despite slightly higher liver/spleen accumulation than F10T5, toxicology assessments confirm no hepatorenal toxicity (BUN/ALT/AST within normal ranges) or histopathological changes. Co-localization analyses demonstrate superior penetration into deep brain regions like the hippocampus, critical for treating neurodegenerative disorders. With a LogD of 12.3, F11T6 balances lipid solubility and biodegradability, outperforming clinical benchmarks in both efficiency (40× SM102) and neuron specificity. This platform holds transformative potential for delivering CRISPR-Cas9, siRNA, or neurotrophic factors, particularly in diseases demanding high-dose CNS transfection with minimal off-target effects.

Product information

CAS No.	Not available
Chemical Name	Lipid F11T6
Formula	C66H132O10N2
M.Wt	1,113.79
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: 1113.79 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	8.978 mL	1.796 mL	0.898 mL
25 mg	22.446 mL	4.489 mL	2.245 mL
50 mg	44.892 mL	8.978 mL	4.489 mL
100 mg	89.784 mL	17.957 mL	8.978 mL
250 mg	224.459 mL	44.892 mL	22.446 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

Not available