DC67544 | HCQ Lipid 4（HCQ-4）

Instructions for Use

HCQ-4 is a rationally engineered ionizable lipid derived from hydroxychloroquine (HCQ), featuring a ditetradecylamine-derived twin-C14 saturated hydrocarbon tail linked to the HCQ headgroup via a succinic acid spacer. Synthesized through a three-step route involving HCQ deprotonation, ditetradecylamine carboxylation, and EDC/DMAP-mediated amidation, this lipid forms the core of optimized lipid nanoparticles (LNPs) at a molar ratio of 60:10:40:0.5 (HCQ-4:DOPE:cholesterol:DMG PEG₂₀₀₀). The structure enables dual functionality: (1) Spleen-selective mRNA delivery (2.3-fold higher splenic vs. hepatic transfection) via 80-100 nm particle size, near-neutral charge (-3 mV), and low PEG density, facilitating immune cell uptake; (2) Tumor microenvironment modulation through HCQ-mediated repolarization of M2 macrophages to antitumor M1 phenotype (iNOS⁺ cells ↑2.5-fold, CD206⁺ cells ↓60%). This bifunctional design synergistically enhances mRNA cancer vaccine efficacy, demonstrating superior prophylactic/therapeutic antitumor activity and antimetastatic effects compared to clinical benchmarks like MC-3 LNP.

Product information

CAS No.	Not available
Chemical Name	HCQ Lipid 4（HCQ-4）
Formula	C50H87O3ClN4
M.Wt	827.72
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: 827.72 g/mol. Volumes are final solution volumes.

Mass	1 mM	5 mM	10 mM
10 mg	12.081 mL	2.416 mL	1.208 mL
25 mg	30.203 mL	6.041 mL	3.020 mL
50 mg	60.407 mL	12.081 mL	6.041 mL
100 mg	120.814 mL	24.163 mL	12.081 mL
250 mg	302.035 mL	60.407 mL	30.203 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