

DC153158 | ND-O1 (SM-86 Analog-2)

Instructions for Use

ND-O1 (SM-86 Analog-2) is a novel ionizable lipid designed to improve the delivery of siRNA via lipid nanoparticles (LNPs) for treating liver fibrosis. It is derived from SM-86 (structurally similar to SM-102, used in COVID-19 mRNA vaccines) but incorporates an ether bond within its hydrophobic tail, a first-of-its-kind modification aimed at enhancing delivery efficiency. In Vitro Efficiency: ND-O1 LNPs (LNP-O1) showed significantly higher siRNA transfection efficiency in activated fibroblasts compared to Lipid 5 LNPs (LNP-M). In Vivo Efficacy: In a CCl₄-induced liver fibrosis mouse model, LNP-O1/siHSP47 (loaded with HSP47-targeting siRNA) reduced HSP47 expression by ~84%, threefold more effective than LNP-M. This led to a dramatic reduction in collagen deposition and marked improvement in liver fibrosis. Safety: The ether bond modification did not introduce additional toxicity, maintaining biocompatibility. ND-O1 represents a breakthrough in ionizable lipid design, demonstrating that strategic placement of ether bonds in hydrophobic tails can enhance LNP performance without compromising safety. Its success highlights its potential for clinical translation in RNA-based therapies for liver fibrosis and other hepatic diseases.

Product information

CAS No.	Not available
Chemical Name	ND-O1 (SM-86 Analog-2)
Formula	C ₄₃ H ₈₅ NO ₆
M.Wt	712.15
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.

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

Mass	1 mM	5 mM	10 mM
10 mg	14.042 mL	2.808 mL	1.404 mL
25 mg	35.105 mL	7.021 mL	3.510 mL
50 mg	70.210 mL	14.042 mL	7.021 mL
100 mg	140.420 mL	28.084 mL	14.042 mL
250 mg	351.050 mL	70.210 mL	35.105 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

Ether bond-modified lipid nanoparticles for enhancing the treatment effect of hepatic fibrosis-International Journal of Pharmaceutics-Runxuan Chu a, Jianglong Kong b, Qiang Gao a, Yani Yang a, Ting Pan a c, Xiaohong Lu a, Zhefeng Wang a, Yi Wang b, Jun He Volume 671, 25 February 2025, 125192