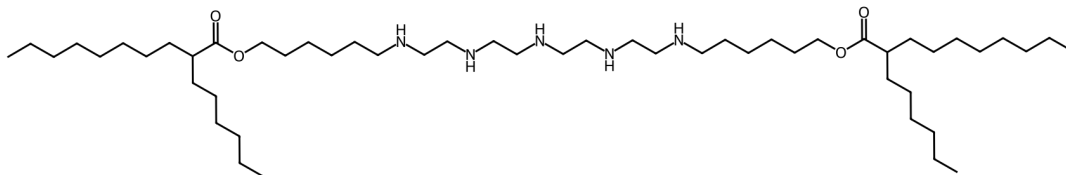


PA97MD101

DCL0011 | Research-use ionizable lipid | Product & literature guide



Description

PA97MD101 is an ester-containing ionizable lipid with a tetraethylenepentamine-derived headgroup and two branched hydrophobic ester arms. Identified through machine-learning-guided screening and independent animal validation, its LNPs produced approximately fourfold higher hepatic luciferase expression than SM-102 in mice after intravenous Fluc mRNA delivery at 0.1 mg/kg. The study also demonstrated Cre-dependent liver recombination and Cas9/sgTtr-mediated TTR suppression. Formulation-dependent activity was associated with acidic-pH membrane activity and reduced lysosomal colocalization. PA97MD101 is a preclinical research candidate for hepatic mRNA and CRISPR cargo delivery.

Catalog / product	DCL0011 / PA97MD101
Molecular formula	C52H107N5O4
Average molecular weight	866.46 g/mol (calculated neutral parent)
Stereochemistry / salt	Two unassigned stereocenters; no counterion or solvate depicted
Commercial specifications	Pack sizes, price, stock, purity and CAS: inquire

Published formulation and LNP properties

Lipid composition (mol%)	PA97MD101 / DSPC / cholesterol / PEG-DMG: 50 / 10 / 38.5 / 1.5
N/P ratio	Not reported
Apparent LNP pKa	6.85, TNS fluorescence assay
Encapsulation efficiency	91.19 +/- 0.58% SD, n=3, RiboGreen assay

Sources: Main Methods pp. 10-11; Supplementary Fig. 25, p. 26.

Functional delivery evidence in mice

Cargo	Conditions	Reported result
Fluc mRNA	0.1 mg/kg IV; C57BL/6 mice; 6 h	~4-fold higher hepatic Fluc output than SM-102 (author-reported).
Cre mRNA	0.25 mg/kg IV; mTmG mice; day 3	~6.75-fold higher liver-level Cre-dependent output reported; hepatocyte-enriched functional expression.
Cas9 + sgTtr	Cas9 0.25 mg/kg + sgRNA 0.05 mg/kg per injection; IV on 2 consecutive days; day 7	Lower hepatic Ttr FISH signal and serum TTR than SM-102. Not a genomic editing percentage.
hEPO mRNA	0.25 mg/kg IV; C57BL/6 mice; 24 h	Higher serum hEPO than SM-102 and PA86MD16 in Fig. 6f.

Values shown are literature-reported results for the cited formulation and study conditions. They do not guarantee performance of the supplied product in other formulations or experiments.

Preparation reference

The study used 10 mM sodium citrate (pH 4.5) for the RNA aqueous phase and ethanol for the lipid phase. Microfluidic flow rates were 9 mL/min aqueous and 3 mL/min organic (3:1; total 12 mL/min). LNPs underwent at least three 30 kDa filter wash cycles and 0.22 micrometer filtration, were adjusted to 1 mg/mL total lipid and stored at 4 C until use. This describes the published LNP procedure, not a validated shelf life for a DC Chemicals formulation.

Interpretation and handling

The 40:1 lipid:mRNA mass ratio was reported for the HeLa in vitro screen and is not an N/P ratio. Major animal endpoints used n=3 mice/group. Acute histology and cytokine findings do not establish chronic or clinical safety. No receptor-specific targeting or genomic indel percentage is established here.

Store the supplied lipid at -20 C and follow batch-specific COA/SDS instructions. Confirm identity, purity, solvent compatibility and concentration before preparing stocks. The paper does not establish a storage shelf life or dissolution protocol for the supplied commercial material.

Structure verification

Structure: Supplementary Fig. 18 and Fig. 22, pp. 19 and 23-24. Formula, average molecular weight and SMILES were derived from the assigned predominant structure. Calculated neutral exact mass 865.83231 agrees with the source; reported HRMS [M+Na]⁺ is 888.8228. Trace isomeric species were not excluded by the authors.

Reference

Zhang Z, Ren Y, Kong D, Feng J, Hu K, Xu X, Deng F, Li P, Wang J, Huang W, Wei G, Su Y, Tan Y, Zhang S, Sun X, Kang F, Yan H. Interpretable AI-guided discovery of degradable ionizable lipids with enhanced hepatic mRNA delivery in vivo. Nature Communications. 2026. Article in Press. doi:10.1038/s41467-026-78635-1.

<https://doi.org/10.1038/s41467-026-78635-1>