

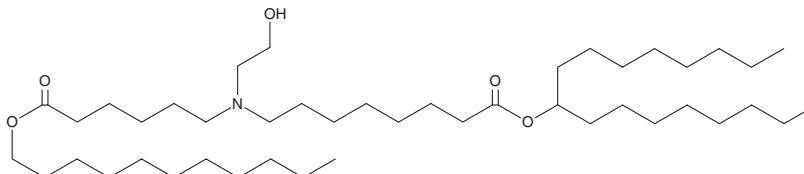
PRODUCT INFORMATION



SM-102

Item No. 33474

CAS Registry No.: 2089251-47-6
Formal Name: 8-[(2-hydroxyethyl)[6-oxo-6-(undecyloxy)hexyl]amino]octanoic acid, 1-octylnonyl ester
Synonyms: CAY10779, Lipid H, LNP-102
MF: C₄₄H₈₇NO₅
FW: 710.2
Purity: ≥98%
Supplied as: A 100 mg/ml solution in ethanol
Storage: -20°C
Stability: ≥1 year



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

SM-102 is supplied as a solution in ethanol. To change the solvent, simply evaporate the ethanol under a gentle stream of nitrogen and immediately add the solvent of choice. SM-102 is soluble in chloroform at a concentration of 100 mg/ml.

Description

SM-102 is an ionizable cationic lipid ($pK_a = 6.68$) that has been used in the generation of lipid nanoparticles (LNPs) for the delivery of mRNA and plasmid DNA *in vitro* and *in vivo*.^{1,2} It inhibits inward-rectifying potassium currents mediated by human-ether-a-go-go (hERG), also known as Kv11.1, in GH3 rat pituitary cells and MA-10 mouse Leydig cells ($IC_{50}S = 108$ and $98 \mu M$, respectively).³ Administration of luciferase mRNA in SM-102-containing LNPs induces hepatic luciferase expression in mice.¹ LNPs containing SM-102 and Q₁-SM-102 (Item No. 41239) as a cationic lipid pair (CLP) and encapsulating a luciferase reporter induce luciferase expression in the lungs and spleen in mice.⁴ Intramuscular immunization of LNPs containing SM-102 and encapsulating mRNA encoding the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spike glycoprotein increases serum SARS-CoV-2 spike glycoprotein-specific IgG titers in mice.⁵ LNPs containing SM-102 and encapsulating mRNA encoding β -catenin increase bone volume in a mouse model of tibia fracture repair when administered via injection to the fracture callus.⁶ Formulations containing SM-102 have been used in the development of LNPs for delivery of mRNA-based vaccines.

Reference

1. Sabnis, S., Kumarasinghe, E.S., Salerno, T., *et al.* A novel amino lipid series for mRNA delivery: Improved endosomal escape and sustained pharmacology and safety in non-human primates. *Mol. Ther.* **26(6)**, 1509-1519 (2018).
2. Zhang, W., Pfeifle, A., Lansdell, C., *et al.* The expression kinetics and immunogenicity of lipid nanoparticles delivering plasmid DNA and mRNA in mice. *Vaccines (Basel)* **11(10)**, 1580 (2023).
3. Cho, H.-Y., Chuang, T.-H., and Wu, S.-N. Effective perturbations on the amplitude and hysteresis of Erg-mediated potassium current caused by 1-octylnonyl 8-[(2-hydroxyethyl)[6-oxo-6-(undecyloxy)hexyl]amino]octanoate (SM-102), a cationic Lipid. *Biomedicines* **9(10)**, 1367 (2021).
4. Zeng, G., He, Z., Yang, H., *et al.* Cationic lipid pairs enhance liver-to-lung tropism of lipid nanoparticles for *in vivo* mRNA delivery. *ACS Appl. Mater. Interfaces* **16(20)**, 25698-25709 (2024).
5. Chen, K., Fan, N., Huang, H., *et al.* mRNA vaccines against SARS-CoV-2 variants delivered by lipid nanoparticles based on novel ionizable lipids. *Adv. Funct. Mater.* **32(39)**, (2022).
6. Nelson, A.L., Mancino, C., Gao, X., *et al.* β -catenin mRNA encapsulated in SM-102 lipid nanoparticles enhances bone formation in a murine tibia fracture repair model. *Bioact. Mater.* **39**, 273-286 (2024).

WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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