

Product data sheet



MedKoo Cat#: 555960 Name: DOTMA CAS: 104872-42-6 Chemical Formula: C ₄₂ H ₈₄ ClNO ₂ Exact Mass: 669.6191 Molecular Weight: 670.589		
Product supplied as:	Powder	
Purity (by HPLC):	≥ 98%	
Shipping conditions	Ambient temperature	
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.	
	In solvent: -80°C 3 months; -20°C 2 weeks.	

1. Product description:

DOTMA is one of the first cationic lipid used for gene transfection. DOTMA is an effective transfection agent in vitro and in vivo. DOTMA carries a positive charge on the surface of liposomes which condenses anionic nucleic acids and promotes efficient interactions between the cell membrane and the liposome.

2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under “QC And Documents” section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	50.0	0.03

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	1.49 mL	7.46 mL	14.91 mL
5 mM	0.30 mL	1.49 mL	2.98 mL
10 mM	0.15 mL	0.75 mL	1.49 mL
50 mM	0.03 mL	0.15 mL	0.30 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of “Calculator”

6. Recommended literature which reported protocols for in vitro and in vivo study

In vitro study

1. Gendron F, Grasser M, Le Guennic B. Near-infrared circular dichroism of the ytterbium DOTMA complex: an ab initio investigation. *Phys Chem Chem Phys*. 2022 Mar 2;24(9):5404-5410. doi: 10.1039/d1cp01675j. PMID: 35170600.

2. Aime S, Botta M, Garda Z, Kucera BE, Tircso G, Young VG, Woods M. Properties, solution state behavior, and crystal structures of chelates of DOTMA. *Inorg Chem*. 2011 Sep 5;50(17):7955-65. doi: 10.1021/ic2012827. Epub 2011 Aug 5. PMID: 21819052; PMCID: PMC3204394.

In vivo study

1. Kurosaki T, Kanda H, Hashizume J, Sato K, Harasawa H, Nakamura T, Sasaki H, Kodama Y. Delivery of pDNA to the Lung by Lipopolyplexes Using N-Lauroylsarcosine and Effect on the Pulmonary Fibrosis. *Pharmaceutics*. 2021 Nov 22;13(11):1983. doi: 10.3390/pharmaceutics13111983. PMID: 34834398; PMCID: PMC8625672.

2. Mashal M, Attia N, Puras G, Martínez-Navarrete G, Fernández E, Pedraz JL. Retinal gene delivery enhancement by lycopene incorporation into cationic niosomes based on DOTMA and polysorbate 60. *J Control Release*. 2017 May 28;254:55-64. doi: 10.1016/j.jconrel.2017.03.386. Epub 2017 Mar 24. PMID: 28347807.

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7. Bioactivity

Biological target:

DOTMA, as a tetra-methylated DOTA analogue, is a cationic lipid and can be used as a non-viral vector for gene therapy.

In vitro activity

In particular, the Ln(3+) chelates of DOTMA exhibit a marked preference for the monocapped twisted square antiprismatic coordination isomer which imparts more rapid water exchange kinetics on the chelates; $\tau(M)(298)$ was determined to be 85 ns for GdDOTMA.

Reference: Inorg Chem. 2011 Sep 5;50(17):7955-65. <https://pubmed.ncbi.nlm.nih.gov/21819052/>

In vivo activity

The present study aimed to evaluate the incorporation of the natural lipid lycopene into niosome formulations based on cationic lipid DOTMA and polysorbate 60 non-ionic surfactant to analyze the potential application of this novel formulation to deliver genetic material into the rat retina. Both subretinal and intravitreal administrations to the rat retina showed that nioplexes were able to transfect efficiently the outer segments of the retina, which offer reasonable hope for the treatment of many inherited retinal diseases by a safe non-viral vector formulation after the less invasive intravitreal administration.

Reference: J Control Release. 2017 May 28;254:55-64. <https://pubmed.ncbi.nlm.nih.gov/28347807/>

Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.