

Product data sheet



MedKoo Cat#: 414874 Name: DSPE CAS: 1069-79-0 Chemical Formula: C ₄₁ H ₈₂ NO ₈ P Exact Mass: 747.5778 Molecular Weight: 748.0798	
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:

DSPE has been used in an FDA approved liposomal drug. It is the starting material for the synthesis of mPEG-DSPE, a widely used surface modifying amphiphilic molecule that keeps liposomes from interacting with blood components and provides a long circulation time for liposomes and other nanoparticles. DSPE has been explored to construct liposomes that are stable and long circulating in blood, but promptly release its content after ultrasound sonication.

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
Chloroform	3.0	4.01

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	1.34 mL	6.68 mL	13.37 mL
5 mM	0.27 mL	1.34 mL	2.67 mL
10 mM	0.13 mL	0.67 mL	1.34 mL
50 mM	0.03 mL	0.13 mL	0.27 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

- Xu B, Ding Z, Hu Y, Zhang T, Shi S, Yu G, Qi X. Preparation and Evaluation of the Cytoprotective Activity of Micelles with DSPE-PEG-C60 as a Carrier Against Doxorubicin-Induced Cytotoxicity. *Front Pharmacol.* 2022 Aug 4;13:952800. doi: 10.3389/fphar.2022.952800. PMID: 35991873; PMCID: PMC9386048.
- Zhao F, Xiao K, Wu C. Glucose-PEG2000-DSPE modified carbamazepine nano system alleviated cell apoptosis and oxidative stress in epilepsy. *Nucleosides Nucleotides Nucleic Acids.* 2022;41(7):671-683. doi: 10.1080/15257770.2022.2061714. Epub 2022 Apr 15. PMID: 35428408.

In vivo study

- Gao Y, Sun Y, Liao G, Zhang H, Long Q. DSPE-PEG polymers for improving pulmonary absorption of poorly absorbed macromolecules in rats and relative mechanism. *Drug Dev Ind Pharm.* 2021 Feb;47(2):337-346. doi: 10.1080/03639045.2021.1879837. Epub 2021 Feb 4. PMID: 33502913.
- Liu H, Liu N, Teng W, Chen J. Study on a dSPE-LC-MS/MS method for lysophosphatidylcholines and underivatized neurotransmitters in rat brain tissues. *J Chromatogr B Analyt Technol Biomed Life Sci.* 2018 Oct 1;1096:11-19. doi: 10.1016/j.jchromb.2018.07.040. Epub 2018 Jul 29. PMID: 30125781.

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7. Bioactivity

Biological target:

1,2-Distearoyl-sn-glycero-3-phosphorylethanolamine (DSPE) is a phosphoethanolamine (PE) lipid that can be used in the synthesis of liposomes.

In vitro activity

The release behaviors of DOX from DSPE-PEG-C60 micelles were consistent with the DSPE-PEG micelles, and it showed sustained release. There was lower cytotoxicity of DSPE-PEG-C60 micelles on normal cell lines (L02, H9c2, GES-1) than free DOX and DSPE-PEG micelles. In conclusion, the prepared DOX-loaded DSPE-PEG-C60 micelles have great promise for safe, effective tumor therapy.

Reference: Front Pharmacol. 2022 Aug 4;13:952800. <https://pubmed.ncbi.nlm.nih.gov/35991873/>

In vivo activity

Intrapulmonary delivery of these DSPE-PEG polymers significantly enhanced absorptions of poorly absorbed model drugs and did not induce serious damage to the pulmonary membranes of rats. These findings suggested that these DSPE-PEG polymers are potential for promoting absorptions of poorly absorbable macromolecules with no evidence of damage to the local pulmonary membranes of rats.

Reference: Drug Dev Ind Pharm. 2021 Feb;47(2):337-346. <https://pubmed.ncbi.nlm.nih.gov/33502913/>

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.