Data Sheet (Cat.No.T4893)

TargetMol

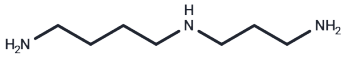
Spermidine

Chemical Properties

CAS No. : 124-20-9

Formula: C7H19N3

Molecular Weight: 145.25



Storage: Pure form: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

Description	Spermidine (N-(3-Aminopropyl)-1,4-diaminobutane) inhibits NOS1 (nNOS). Spermidine binds and precipitates DNA and may be used for purification of DNA binding proteins. Spermidine activates PNK (polynucleotide kinase T4). Spermidine binds to and activates NMDA and has been shown to potentiate NMDA-induced currents in a concentration-dependent manner.
Targets(IC50)	Endogenous Metabolite
In vitro	**METHODS**: Human neuroblastoma cells SH-SY5Y were treated with Spermidine (0.05-10 μM) for 24-48 h. Mitochondrial metabolic activity was measured by MTT assay and ATP production assay. **RESULTS**: No effect of Spermidine was observed after 24 h. 0.1 and 1 μM Spermidine significantly increased cellular metabolic activity and ATP production after 48 h of treatment. The most effective concentration of Spermidine, 0.1 μM, induced an 8.2% increase in metabolic activity and a 4% increase in ATP production. [1] **METHODS**: The retinal pigment epithelial cell line ARPE-19 was treated with H2O2 (300 μM) and Spermidine (10 μM) for 24 h. Apoptosis was detected by Flow cytometry. **RESULTS**: 300 μM H2O2 significantly increased the frequency of annexin V-positive cells to approximately 25%, but Spermidine significantly inhibited this increase. The results suggest that Spermidine attenuates H2O2-mediated oxidative stress-induced apoptosis in ARPE-19 cells. [2]
In vivo	**METHODS**: To study the effects on diabetes, Spermidine (10 mM) was administered orally in water to non-obese diabetic (NOD) mice (type 1 diabetes mouse model) for thirty weeks. **RESULTS**: Treatment of NOD mice with Spermidine resulted in a higher incidence of diabetes, although pancreatic insulitis was not altered.Spermidine modulated pancreatic tissue polyamine levels and increased signs of autophagy.Spermidine resulted in an increase in the proportion of pro-inflammatory T-cells in the pancreatic lymph nodes (pLN) of diabetic mice. [3]

Solubility Information

Solubility	DMSO: 250 mg/mL (1721.17 mM),Sonication is recommended. H2O: 100 mg/mL (688.47 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	5% DMSO+95% Saline: 1.67 mg/mL (11.5 mM),Solution. *Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	6.8847 mL	34.4234 mL	68.8468 mL
5 mM	1.3769 mL	6.8847 mL	13.7694 mL
10 mM	0.6885 mL	3.4423 mL	6.8847 mL
50 mM	0.1377 mL	0.6885 mL	1.3769 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

Fairley LH, et al. Spermidine Rescues Bioenergetic and Mitophagy Deficits Induced by Disease-Associated Tau Protein. Int J Mol Sci. 2023 Mar 10;24(6):5297.

Wang Q, Zhao Y, Qin X, et al.Deciphering relationship between depression and microbial molecules based on multi-omics: A case study of Chaigui Granules.Chinese Herbal Medicines.2024

Kim DH, et al. Spermidine Attenuates Oxidative Stress-Induced Apoptosis via Blocking Ca2+ Overload in Retinal Pigment Epithelial Cells Independently of ROS. Int J Mol Sci. 2021 Jan 29;22(3):1361.

Karacay C, et al. The effect of spermidine on autoimmunity and beta cell function in NOD mice. Sci Rep. 2022 Mar 16;12(1):4502.