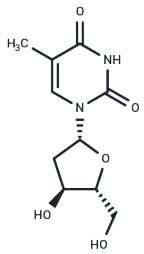
Data Sheet (Cat.No.TWP2911)

TargetMol

Thymidine

Chemical Properties



CAS No. : 50-89-5

Formula: C10H14N2O5

Molecular Weight: 242.23

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

Biological Description

Description	Thymidine (DThyd) is a cell synchronizing agent and a specific precursor of deoxyribonucleic acid. Thymidine inhibits DNA synthesis and can cause cell cycle arrest in the G1/S phase.
Targets(IC50)	Endogenous Metabolite,DNA/RNA Synthesis,Virus Protease
In vitro	**METHODS**: Human hepatocellular carcinoma cells HepG2 were treated with Thymidine (300-1200 μM) and H2O2 (1 mM) for 0.5 h. DNA damage was detected by comet assay. **RESULTS**: For the control and Thymidine alone groups, the samples appeared almost circular due to the absence of DNA damage. After exposure to 1.0 mM H2O2 for 0.5 h, a clear comet was observed, indicating DNA damage in this group. However, there was a decreasing trend in the extent of DNA damage in the three combination groups as the concentration of Thymidine pretreatment increased. [1] **METHODS**: Jurkat, MOLT4 and NALM6 cells were treated with Thymidine (2 mM) for 18 h. **RESULTS**: Thymidine arrests the cell cycle at the G1/S boundary. [2]
In vivo	**METHODS**: To investigate the effects of folate analogs on superantigen-reactive peripheral T cells in vivo, Thymidine (500 mg/kg) was injected intraperitoneally into MTX- or tomudex-administered mice twice daily for ten days. **RESULTS**: Both MTX and tomudex blocked the expansion and accelerated the peripheral clearance of Vβ8-selective T cells. Thymidine administration completely eliminated this effect, suggesting that inhibition of glycoside synthase (TS), but not other folate-dependent enzymes, is the predominant mechanism. [3]

Solubility Information

Solubility	Ethanol: < 1 mg/mL (insoluble) DMSO: 245 mg/mL (1011.44 mM),Sonication is recommended. Pyridine, Methanol, etc.: Soluble, (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+90% Saline: 5 mg/mL (20.64 mM),Solution. Saline: 25 mg/mL (103.21 mM),Solution. 5% DMSO+95% Saline: 2.63 mg/mL (10.86 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*

In vivo Formulation	*vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	4.1283 mL	20.6415 mL	41.2831 mL
5 mM	0.8257 mL	4.1283 mL	8.2566 mL
10 mM	0.4128 mL	2.0642 mL	4.1283 mL
50 mM	0.0826 mL	0.4128 mL	0.8257 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

Li Y, et al. Protective Effect of Thymidine on DNA Damage Induced by Hydrogen Peroxide in Human Hepatocellular Cancer Cells. ACS Omega. 2020 Aug 19;5(34):21796-21804.
Zhao Y, Yang J, Lu D, et al.The Loss-Function of KNL1 Causes Oligospermia and Asthenospermia in Mice by Affecting the Assembly and Separation of the Spindle through Flow Cytometry and Immunofluorescence.Sensors. 2023, 23(5): 2571.
Mayyas IM, et al. Hairpin-bisulfite sequencing of cells exposed to decitabine documents the process of DNA demethylation. Epigenetics. 2021 Nov;16(11):1251-1259.
Wang J, Chen Y, Li S, et al.PP2A inhibition causes synthetic lethality in BRCA2-mutated prostate cancer models via reactivating spindle assembly checkpoint.The Journal of Clinical Investigation.2023
Izeradjene K, et al. Inhibition of thymidine synthesis by folate analogues induces a Fas-Fas ligand-independent deletion of superantigen-reactive peripheral T cells. Int Immunol. 2001 Jan;13(1):85-93.
Zheng M, Li J, Guo H, et al.IMPDH inhibitors upregulate PD-L1 in cancer cells without impairing immune checkpoint inhibitor efficacy.Acta Pharmacologica Sinica.2024: 1-10.