Tetrahydrofolic acid

Cat. No.: HY-14520

CAS No.: 135-16-0

Molecular Formula: $C_{19}H_{23}N_7O_6$

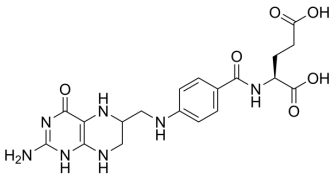
Molecular Weight: 445.43

Target: Endogenous Metabolite

Pathway: Metabolic Enzyme/Protease

Storage: -80°C, protect from light, stored under nitrogen

* The compound is unstable in solutions, freshly prepared is recommended.



SOLVENT & SOLUBILITY

In Vitro

DMSO : 20.83 mg/mL (46.76 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.2450 mL	11.2251 mL	22.4502 mL
	5 mM	0.4490 mL	2.2450 mL	4.4900 mL
	10 mM	0.2245 mL	1.1225 mL	2.2450 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (4.67 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (4.67 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Tetrahydrofolic acid (L-5,6,7,8-Tetrahydrofolic acid) is the biologically active vitamin B9 folate derivative. Tetrahydrofolic acid is a donor of one-carbon groups for amino acids, nucleic acids, and lipids. Tetrahydrofolic acid serves as an acceptor of free formaldehyde, producing 5,10-methylenetetrahydrofolate-Tetrahydrofolic acid[1].

IC_{50} & Target

Human Endogenous Metabolite

In Vitro

Tetrahydrofolic acid (0-200 μM; 3 days; $Adh5^{-/-}$ DT40 cells) exposure is cytotoxic to Adh5- and Fanconi anemia (FA)-deficient cells due to the accumulation of extensive DNA damage and chromosome breaks[1].

?Tetrahydrofolic acid (0-100 μM; 16 hours; $Adh5^{-/-}$ DT40 cells) treatment strongly promots FANCD2 and ser139-H2AX focus formation in $Adh5^{-/-}$ cells in a dose-dependent manner[1].

?Tetrahydrofolic acid exposure activates the DNA damage response (DDR) due to uncontrolled activity of the thymidylate

synthase enzyme, which causes a depletion of essential nucleotides, and promotes repair by a homologous recombination mechanism[1].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[1]

Cell Line:	Adh5$^{-/-}$ DT40 cells
Concentration:	0-200 μM
Incubation Time:	3 days
Result:	Viability of Adh5$^{-/-}$ DT40 cells rapidly dropped.

Western Blot Analysis[1]

Cell Line:	Adh5$^{-/-}$ DT40 cells
Concentration:	0-200 μM
Incubation Time:	16 hours
Result:	Strongly promoted FANCD2 and ser139-H2AX focus formation in Adh5$^{-/-}$ cells in a dose-dependent manner.

In Vivo

Tetrahydrofolic acid (62.5 mg/kg; intraperitoneal injection; daily; Adh5$^{-/-}$ mice) treatment perturbs the hematopoiesis of hematopoietic cells, increases ser139-H2AX phosphorylation, and decreases the survival of progenitor cells (HSPCs) suggesting that excess Tetrahydrofolic acid could be mutagenic and genotoxic to bone marrow cells[1].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Adh5$^{-/-}$ mice[1]
Dosage:	62.5 mg/kg
Administration:	Intraperitoneal injection; daily
Result:	Perturbed hematopoiesis, increased ser139-H2AX phosphorylation, and decreased the survival of progenitor cells (HSPCs).

CUSTOMER VALIDATION

- J Biol Chem. 2022 Sep 28;102548.

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REFERENCES

[1]. Clara B García-Calderón, et al. Genotoxicity of Tetrahydrofolic Acid to Hematopoietic Stem and Progenitor Cells. Cell Death Differ. 2018 Nov;25(11):1967-1979.

Caution: Product has not been fully validated for medical applications. For research use only.

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