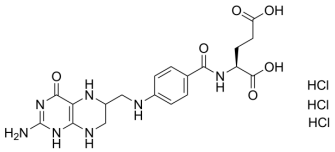
Tetrahydrofolic acid trihydrochloride

Cat. No.:	HY-14520B
CAS No.:	150731-85-4
Molecular Formula:	$C_{19}H_{26}Cl_3N_7O_6$
Molecular Weight:	554.81
Target:	Endogenous Metabolite
Pathway:	Metabolic Enzyme/Protease
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description	Tetrahydrofolic acid (L-5,6,7,8-Tetrahydrofolic acid) trihydrochloride is the biologically active vitamin B9 folate derivative. Tetrahydrofolic acid trihydrochloride is a donor of one-carbon groups for amino acids, nucleic acids, and lipids. Tetrahydrofolic acid trihydrochloride 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) trihydrochloride 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) trihydrochloride strongly promots FANCD2 and ser139-H2AX focus formation in Adh5$^{-/-}$ cells in a dose-dependent manner[1]. Tetrahydrofolic acid trihydrochloride 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) trihydrochloride perturbs the hematopoiesis of hematopoietic cells, increases ser139-H2AX phosphorylation, and decreases the survival of progenitor cells (HSPCs) suggesting that excess Tetrahydrofolic acid trihydrochloride 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]. Steven W. Bailey, et al. Synthesis of Tetrahydropteridine C6-Stereoisomers, Including N6-Formyl-(68)-tetrahydrofolic Acid. The Journal of Organic Chemistry, 57(16), 4470-4477.

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