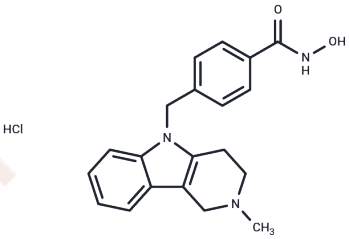
Data Sheet (Cat.No.T6161)

TargetMol

Tubastatin A Hydrochloride

Chemical Properties



CAS No. :	1310693-92-5
Formula:	C20H21N3O2·HCl
Molecular Weight:	371.86
Storage:	Store at low temperature 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	Tubastatin A Hydrochloride (TSA HCl) is an effective and specific HDAC6 inhibitor (IC50: 15 nM). It has selectivity (>1000-fold) against all other isozymes except HDAC8 (>57-fold).
Targets(IC50)	Apoptosis,Antibacterial,HDAC,Autophagy
In vitro	Tubastatin A exhibits high selectivity for all 11 HDAC isoforms, demonstrating over 1000-fold selectivity compared to all but HDAC8, for which it shows approximately 57-fold selectivity. In assays measuring neurodegeneration induced by homocysteic acid (HCA), Tubastatin A offers dose-dependent neuroprotection, achieving near-complete protection at concentrations of 10 μM, starting from 5 μM. Further, at a dosage of 100 ng/mL in vitro, it enhances the suppression of T cell proliferation by Foxp3+ T-regulatory cells (Tregs). In C2C12 cells, treatment with Tubastatin A disrupts myotube formation by causing early hyperacetylation of alpha-tubulin during the myogenic process, though it permits myotube elongation when hyperacetylation occurs within the myotubes. Additionally, recent studies have shown that Tubastatin A increases cell elasticity in mouse ovarian cancer cell lines, MOSE-E and MOSE-L, as determined by atomic force microscopy (AFM), without significantly altering the actin microfilament or microtubule networks.
In vivo	Daily administration of 0.5 mg/kg Tubastatin A inhibits HDAC6, enhancing Tregs suppressive activity in mouse models of inflammation and autoimmunity, including various forms of experimental colitis and fully major histocompatibility complex (MHC)-incompatible cardiac allograft rejection. [2]
Kinase Assay	Enzyme Inhibition Assays: Enzyme inhibition assays are performed by the Reaction Biology Corporation, Malvern, PA, using the Reaction Biology HDAC Spectrum platform. (www.reactionbiology.com) The HDAC1, 2, 4, 5, 6, 7, 8, 9, 10, and 11 assays use isolated recombinant human protein; HDAC3/NcoR2 complex is used for the HDAC3 assay. Substrate for HDAC1, 2, 3, 6, 10, and 11 assays is a fluorogenic peptide from p53 residues 379-382 (RHKKAc); substrate for HDAC8 is fluorogenic diacyl peptide based on residues 379-382 of p53 (RHKAcKAc). Acetyl-Lys (trifluoroacetyl)-AMC substrate is used for HDAC4, 5, 7, and 9 assays. Tubastatin A is dissolved in DMSO and tested in 10-dose IC50 mode with 3-fold serial dilution starting at 30 μM. Control Compound Trichostatin A (TSA) is tested in a 10-dose IC50 with 3-fold serial dilution starting at 5 μM. IC50 values are extracted by curve-fitting the dose/response slopes.

Cell Research	Primary cortical neuron cultures are obtained from the cerebral cortex of fetal Sprague-Dawley rats (embryonic day 17) as described previously. All experiments are initiated 24 hours after plating. Under these conditions, the cells are not susceptible to glutamate-mediated excitotoxicity. For cytotoxicity studies, cells are rinsed with warm PBS and then placed in minimum essential medium (Invitrogen) containing 5.5 g/L glucose, 10% fetal calf serum, 2 mM L-glutamine, and 100 μM cystine. Oxidative stress is induced by the addition of the glutamate analogue homocysteate (HCA; 5 mM) to the media. HCA is diluted from 100-fold concentrated solutions that are adjusted to pH 7.5. In combination with HCA, neurons are treated with Tubastatin A at the indicated concentrations. Viability is assessed after 24 hours by MTT assay (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) method.(Only for Reference)

Solubility Information

Solubility	DMSO: 35.7 mg/mL (96 mM),Sonication is recommended. H2O: 7.43 mg/mL (19.98 mM),Sonication and heating are recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 1 mg/mL (2.69 mM),Sonication is recommended. *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	2.6892 mL	13.4459 mL	26.8918 mL
5 mM	0.5378 mL	2.6892 mL	5.3784 mL
10 mM	0.2689 mL	1.3446 mL	2.6892 mL
50 mM	0.0538 mL	0.2689 mL	0.5378 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

Butler KV, et al, J Am Chem Soc, 2010, 132(31), 10842-10846.
Liu S, Zhang H L, Li J, et al.Tubastatin A potently inhibits GPX4 activity to potentiate cancer radiotherapy through boosting ferroptosis.Redox Biology.2023: 102677.
Jia S, Wen X, Zhu M, et al.The pluripotent-to-totipotent state transition in mESCs activates the intrinsic apoptotic pathway through DUX-induced DNA replication stress.Cellular and Molecular Life Sciences.2024, 81(1): 1-12.
de Zoeten EF, et al, Mol Cell Biol, 2011, 31(10), 2066-2078.
Di Fulvio S, et al, PloS One, 2011, 6(12):e28563.
Ketene AN, et al, Integr Biol (Camb), 2012, 4(5), 540-549.

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