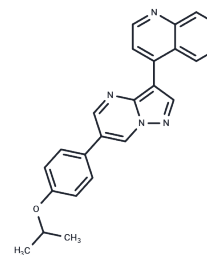


DMH-1

Chemical Properties

CAS No. :	1206711-16-1
Formula:	C ₂₄ H ₂₀ N ₄ O
Molecular Weight:	380.44
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	DMH-1 is a potent and selective Bone Morphogenetic Protein (BMP) inhibitor.
Targets(IC50)	ALK,Autophagy,TGF-beta/Smad
In vitro	<p>METHODS: HEK293 cells were treated with DMH-1 (1-20 μM) for 30 min, then incubated with BMP4 (50 ng/mL) or Activin A (40 ng/mL) for 30 min, and the expression levels of target proteins were detected by Western Blot.</p> <p>RESULTS: DMH-1 blocked BMP4-induced Smad 1/5/8 phosphorylation in HEK293 cells. In contrast, DMH-1 had no effect on BMP4-induced p38 MAPK phosphorylation and Activin A-induced Smad2 phosphorylation in HEK293 cells. [1]</p> <p>METHODS: hiPSC cells were treated with SB43154230 with Noggin (500 ng/mL) or DMH-1 (0.5 μM) for 7 days and the expression of neural precursor markers was detected by qRT-PCR.</p> <p>RESULTS: Neuralization of DMH-1 and Noggin produced a significant percentage of PAX6-positive cells on day 7 in six of the eight cell lines examined. In two cell lines, SM5 and TSC-12B4, the number of PAX6-positive cells was higher in cultures neuralized with Noggin. [2]</p>
In vivo	<p>METHODS: To detect anti-tumor activity in vivo, DMH-1 (5 mg/kg, 12.5% 2-hydroxypropyl-β-cyclodextrin) was injected intraperitoneally every two days for four weeks into SCID mice bearing A549 xenografts.</p> <p>RESULTS: DMH-1 treatment significantly reduced tumor growth in the human tumor xenograft model. At the end of the 4-week treatment, DMH-1 treatment resulted in a significant reduction in tumor volume of approximately 50% compared to the vector control. [3]</p>
Kinase Assay	<p>Kinase assay: All kinase assays are conducted by Reaction Biology Corp. In brief, compounds are tested at 10 concentrations by 3-fold serial dilutions starting at 30 μM, using nonspecific kinase inhibitor staurosporine as control. In vitro kinase reactions are carried out in the presence of 10 μM (33P)γATP. Five kinases tested are the human BMP type-I receptor activin receptor-like kinase 2 (ALK-2/ACVR1), the human TGFβ type-I receptor activin receptor-like kinase 5 (Alk5/TGFβR1), the human VEGF type-II receptor (KDR/Flk-1/VEGFR2), the human AMP-activated protein kinase (AMPK/A1/B1/G1) and the human platelet-derived growth factor receptor-β (PDGFRβ).</p>

Cell Research	About 10,000 A549 cells per well are seeded in 96-well plates and incubated for overnight. The culture medium is then changed to fresh medium containing DMSO or DMH1 at various concentrations. The cells are then incubated for 48 hours and 96 hours before treatment termination by replacing the medium with 100 µL of 10% trichloroacetic acid in 1× PBS, followed by incubation at 4°C for at least 1 hour. Subsequently, the plates are washed with water and air dried. The plates are stained with 50 µL 0.4% sulphorhodamine assay in 1% acetic acid for 30 minutes at room temperature. Unbound dye is washed off with 1% acetic acid. After air drying and solubilization of the protein-bound dye in 10 mM Tris solution, absorbance is read in a microplate reader at 565 nm.(Only for Reference)
---------------	--

Solubility Information

Solubility	DMSO: 12.68 mg/mL (33.33 mM),Sonication is recommended. Ethanol: < 1 mg/mL (insoluble or slightly soluble), H2O: < 1 mg/mL (insoluble or slightly soluble), (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 1.25 mg/mL (3.29 mM),Suspension. <i>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.</i>

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	2.6285 mL	13.1427 mL	26.2854 mL
5 mM	0.5257 mL	2.6285 mL	5.2571 mL
10 mM	0.2629 mL	1.3143 mL	2.6285 mL
50 mM	0.0526 mL	0.2629 mL	0.5257 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

- Hao J, et al. In vivo structure-activity relationship study of dorsomorphin analogues identifies selective VEGF and BMP inhibitors. *ACS Chem Biol.* 2010 Feb 19;5(2):245-53.
- Jiang M, Xiao Y, Weigao E, et al. Characterization of the Zebrafish Cell Landscape at Single-Cell Resolution. *Frontiers in Cell and Developmental Biology.* 2021, 9.
- Neely MD, et al. DMH1, a highly selective small molecule BMP inhibitor promotes neurogenesis of hiPSCs: comparison of PAX6 and SOX1 expression during neural induction. *ACS Chem Neurosci.* 2012 Jun 20;3(6):482-91.
- Eixarch H, Calvo-Barreiro L, Costa C, et al. Inhibition of the BMP Signaling Pathway Ameliorated Established Clinical Symptoms of Experimental Autoimmune Encephalomyelitis. *Neurotherapeutics.* 2020: 1-16.
- Qin X, Fu L, Li C, et al. Optimized inner ear organoids for efficient hair cell generation and ototoxicity response modeling. *Science China Life Sciences.* 2025: 1-15.
- Hao J, et al. DMH1, a small molecule inhibitor of BMP type I receptors, suppresses growth and invasion of lung cancer. *PLoS One.* 2014 Mar 6;9(6):e90748.
- Hao J, et al. *PLoS One.* 2014, 9(3), e90748.
- Hover LD, et al. Small molecule inhibitor of the bone morphogenetic protein pathway DMH1 reduces ovarian cancer cell growth. *Cancer Lett.* 2015 Nov 1;368(1):79-87.
- Eixarch H, Calvo-Barreiro L, Costa C, et al. Inhibition of the BMP Signaling Pathway Ameliorated Established Clinical Symptoms of Experimental Autoimmune Encephalomyelitis. *Neurotherapeutics.* 2020: 1-16.

Inhibitor · Natural Compounds · Compound Libraries · Recombinant Proteins

This product is for Research Use Only · Not for Human or Veterinary or Therapeutic Use

Tel: 781-999-4286 E_mail: info@targetmol.com Address: 34 Washington Street, Wellesley Hills, MA 02481