Small Molecules

DMH1

Activin/Nodal/TGFβ pathway inhibitor;
Inhibits ALK2

Catalog # 73632 1 mg
73634 10 mg

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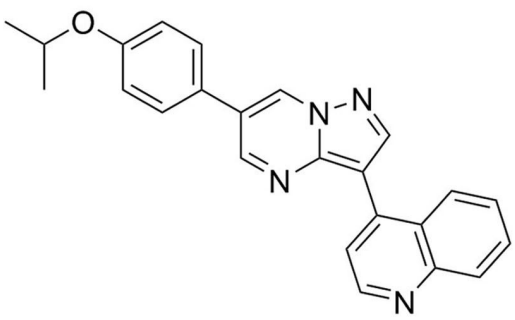
Product Description

DMH1 (dorsomorphin homolog 1) is a selective inhibitor of activin receptor-like kinase 2 (ALK2; IC_{50} = 13 - 108 nM), a type I bone morphogenetic protein (BMP) receptor (Hao et al.; Mohedas et al.). DMH1 exhibits no detectable inhibition of ALK4, ALK5, AMPK, KDR (VEGFR2), or PDGFRβ, although it inhibits ALK1 and ALK3 at nanomolar concentrations (Hao et al.; Mohedas et al.).

Molecular Name:	DMH1
Alternative Names:	Dorsomorphin homolog 1
CAS Number:	1206711-16-1
Chemical Formula:	$C_{24}H_{20}N_4O$
Molecular Weight:	380.4 g/mol
Purity:	≥ 98%
Chemical Name:	4-[6-(4-propan-2-yloxyphenyl)pyrazolo[1,5-a]pyrimidin-3-yl]quinoline
Structure:	

Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. Protect product from prolonged exposure to light. For long-term storage store with a desiccant. Stable as supplied for 12 months from date of receipt.
Solubility:	· DMSO ≤ 2.6 mM · DMF ≤ 50 mM For example, to prepare a 10 mM stock solution in DMF, resuspend 1 mg in 263 µL of DMF. Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported, however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application. Compound has low solubility in aqueous media. For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO concentration above 0.1% due to potential cell toxicity.

Published Applications

DIFFERENTIATION
· Induces differentiation of mouse embryonic stem cells to cardiomyocyte progenitor cells (Ao et al.).
· Induces differentiation of human induced pluripotent stem cells to SOX1- and PAX6-expressing neural precursor cells (Neely et al.).
· Dorsalizes the embryonic axis without disrupting the angiogenic process in early zebrafish embryos (Hao et al. 2010).
CANCER RESEARCH
· Suppresses non-small cell lung cancer cell growth, migration, and invasion in vitro, and attenuates xenografted lung tumor growth in vivo (Hao et al. 2014).
· Inhibits chemotherapeutic drug-induced autophagy response (Sheng et al.).

References

Ao A et al. (2012) DMH1, a novel BMP small molecule inhibitor, increases cardiomyocyte progenitors and promotes cardiac differentiation in mouse embryonic stem cells. PLoS One 7(7): e41627.
Hao J et al. (2014) DMH1, a small molecule inhibitor of BMP type I receptors, suppresses growth and invasion of lung cancer. PLoS One 9(6): e90748.
Hao J et al. (2010) In vivo structure-activity relationship study of dorsomorphin analogues identifies selective VEGF and BMP inhibitors. ACS Chem Biol 5(2): 245–53.
Mohedas AH et al. (2013) Development of an ALK2-biased BMP type I receptor kinase inhibitor. ACS Chem Biol 8(6): 1291–302.
Neely MD et al. (2012) DMH1, a highly selective small molecule BMP inhibitor promotes neurogenesis of hiPSCs: comparison of PAX6 and SOX1 expression during neural induction. ACS Chem Neurosci 3(6): 482–91.
Sakata T & Chen JK. (2011) Chemical “Jekyll and Hyde”s: small-molecule inhibitors of developmental signaling pathways. Chem Soc Rev 40(8): 4318–31.
Sheng Y et al. (2015) DMH1 (4-[6-(4-isopropoxyphenyl)pyrazolo[1,5-a]pyrimidin-3-yl]quinoline) inhibits chemotherapeutic drug-induced autophagy. Acta Pharm Sin B 5(4): 330–6.

Related Small Molecules

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This product is hazardous. Please refer to the Safety Data Sheet (SDS).