Small Molecules

Dorsomorphin

BMP and AMPK pathway inhibitor;
Inhibits ALK2, ALK3, ALK6, and AMPK

Catalog # 72102

10 mg

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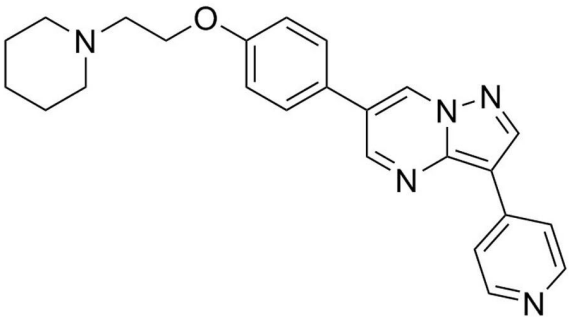
Product Description

Dorsomorphin inhibits the bone morphogenetic protein (BMP) pathway by targeting the type I BMP receptors activin receptor-like kinase (ALK) 2, ALK3, and ALK6. It is also a potent inhibitor of AMP-activated protein kinase (AMPK, Ki = 109 nM) but does not significantly inhibit structurally related kinases such as ZAPK, SYK, PKCθ, PKA, or JAK3 (Bain et al.; Yu et al.).

Molecular Name:	Dorsomorphin
Alternative Names:	Compound C
CAS Number:	866405-64-3
Chemical Formula:	$C_{24}H_{25}N_5O$
Molecular Weight:	399.5 g/mol
Purity:	≥ 98%
Chemical Name:	6-[4-[2-(1-piperidinyl)ethoxy]phenyl]-3-(4-pyridinyl)-pyrazolo[1,5-a]pyrimidine
Structure:	

Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. Protect from prolonged exposure to light. Stable as supplied for 12 months from date of receipt.
Solubility:	· DMSO ≤ 12 mM (with heat applied) · Absolute ethanol ≤ 350 µM · Dimethylformamide (DMF) ≤ 6.2 mM For example, to prepare a 300 µM stock solution in absolute ethanol, resuspend 1 mg in 8.3 mL of absolute ethanol. 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 absolute ethanol 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 ethanol concentration above 0.1% due to potential cell toxicity.

Published Applications

DIFFERENTIATION
· Promotes differentiation of neural progenitor cells from human pluripotent stem cells (Morizane et al.; Zhou et al.).
· Promotes differentiation of cardiomyocytes from mouse and human pluripotent stem cells (Hao et al.; Kattman et al.).
· Promotes differentiation of adipocytes and suppresses osteogenic differentiation of osteoblasts from human mesenchymal cells (Kim et al.).

References

Bain J et al. (2007) The selectivity of protein kinase inhibitors: a further update. Biochem J 408(3): 297–315.
Hao J et al. (2008) Dorsomorphin, a selective small molecule inhibitor of BMP signaling, promotes cardiomyogenesis in embryonic stem cells. PLoS One 3(8): e2904.
Kattman SJ et al. (2011) Stage-specific optimization of activin/nodal and BMP signaling promotes cardiac differentiation of mouse and human pluripotent stem cell lines. Cell Stem Cell 8(2): 228–40.
Kim E-K et al. (2012) Human mesenchymal stem cell differentiation to the osteogenic or adipogenic lineage is regulated by AMP-activated protein kinase. J Cell Physiol 227(4): 1680–7.
Morizane A et al. (2011) Small-molecule inhibitors of bone morphogenic protein and activin/nodal signals promote highly efficient neural induction from human pluripotent stem cells. J Neurosci Res 89(2): 117–26.
Yu PB et al. (2008) Dorsomorphin inhibits BMP signals required for embryogenesis and iron metabolism. Nat Chem Biol 4(1): 33–41.
Zhou J et al. (2010) High-efficiency induction of neural conversion in human ESCs and human induced pluripotent stem cells with a single chemical inhibitor of transforming growth factor beta superfamily receptors. Stem Cells 28(10): 1741–50.

Related Small Molecules

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