Small Molecules

Dorsomorphin

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

Catalog # 72102 10 mg
100-0246 50 mg

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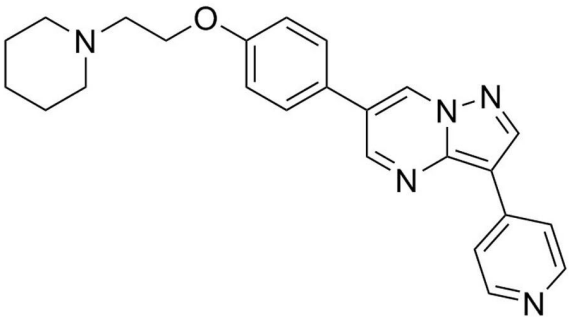
Product Description

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 200 µM stock solution in absolute ethanol, resuspend 10 mg in 130 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).