

Small Molecules

BIRB-796

p38 MAPK inhibitor

Catalog # 72682
72684

1 mg
10 mg



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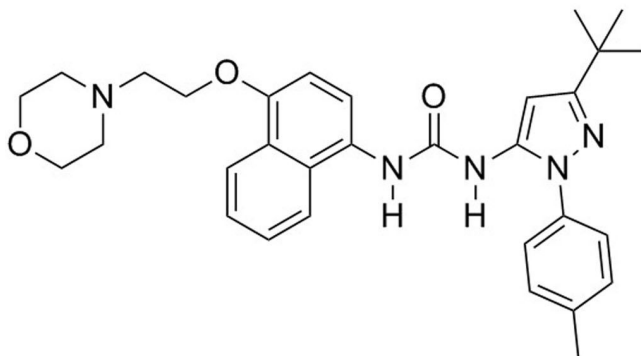
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Product Description

BIRB-796 inhibits the stress-activated p38 mitogen-activated protein kinase (MAPK), which plays a critical role in regulating the production of proinflammatory cytokines such as tumor necrosis factor (TNF) and Interleukin 1 (IL-1). BIRB-796 is a highly potent inhibitor of p38 MAPK ($K_d = 0.1$ nM) that blocks TNF α release in LPS-stimulated THP-1 cells ($IC_{50} = 18$ nM; Pargellis et al.). At 10 μ M, BIRB-796 inhibits c-Jun N-terminal kinase (JNK) 2 α 2 in vitro, but at the low concentration necessary to inhibit p38 MAPK, it does not affect the phosphorylation of JNK substrates in cells (Bain et al.; Kuma et al.).

Molecular Name: BIRB-796
Alternative Names: Doramapimod
CAS Number: 285983-48-4
Chemical Formula: C₃₁H₃₇N₅O₃
Molecular Weight: 527.7 g/mol
Purity: $\geq 98\%$
Chemical Name: N-[3-(1, 1-dimethylethyl)-1-(4-methylphenyl)-1H-pyrazol-5-yl]-N'-[4-[2-(4-morpholinyl)ethoxy]-1-naphthalenyl]-urea

Structure:



Properties

Physical Appearance: A crystalline solid
Storage: Product stable at -20°C as supplied. Protect from prolonged exposure to light. For product expiry date, please contact techsupport@stemcell.com.
Solubility:
· DMSO ≤ 56 mM
· Absolute ethanol ≤ 5.6 mM
For example, to prepare a 10 mM stock solution in DMSO, resuspend 1 mg in 190 μ L of fresh DMSO.

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

MAINTENANCE AND SELF-RENEWAL

- Rescues the self-renewal ability of muscle satellite cells from aged mice (Bernet et al.).
- Increases the regenerative capacity of functional aged skeletal muscle stem cells grown in hydrogel (Cosgrove et al.).
- Blocks GADD45G-induced differentiation of long-term repopulating hematopoietic stem cells (Thalheimer et al.).
- Enhances stem cell activity of cultured umbilical cord blood-derived hematopoietic cells cultured in serum-free medium supplemented with SCF (Catalog #78062), TPO (Catalog #02522), and FLT3L (Baudet et al.).
- Blocks the osteogenic differentiation effect of myocilin on human mesenchymal stem cells (Kwon et al.).

References

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- Bernet JD et al. (2014) p38 MAPK signaling underlies a cell-autonomous loss of stem cell self-renewal in skeletal muscle of aged mice. *Nat Med* 20(3): 265–71.
- Cosgrove BD et al. (2014) Rejuvenation of the muscle stem cell population restores strength to injured aged muscles. *Nat Med* 20(3): 255–64.
- Kuma Y et al. (2005) BIRB796 inhibits all p38 MAPK isoforms in vitro and in vivo. *J Biol Chem* 280(20): 19472–9.
- Kwon HS et al. (2013) Myocilin stimulates osteogenic differentiation of mesenchymal stem cells through mitogen-activated protein kinase signaling. *J Biol Chem* 288(23): 16882–94.
- Pargellis C et al. (2002) Inhibition of p38 MAP kinase by utilizing a novel allosteric binding site. *Nat Struct Biol* 9(4): 268–72.
- Thalheimer FB et al. (2014) Cytokine-Regulated GADD45G Induces Differentiation and Lineage Selection in Hematopoietic Stem Cells. *Stem Cell Reports* 3(1): 34–43.

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