Small Molecules

BIO

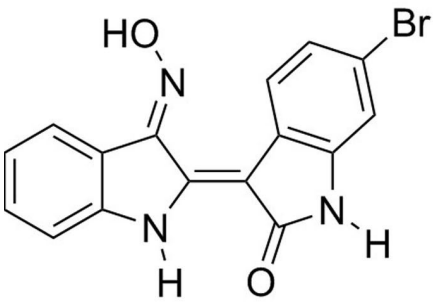
WNT pathway activator; Inhibits GSK3

Catalog # 72032 1 mg
72034 5 mg

STEMCELL™ TECHNOLOGIES
Scientists Helping Scientists™ | WWW.STEMCELL.COM
TOLL FREE PHONE 1 800 667 0322 • PHONE +1 604 877 0713
INFO@STEMCELL.COM • TECHSUPPORT@STEMCELL.COM
FOR GLOBAL CONTACT DETAILS VISIT OUR WEBSITE

Product Description

BIO is an indirubin compound that is cell permeable and is a selective, potent, and reversible inhibitor of glycogen synthase kinase (GSK) 3α and GSK3β (IC_{50} = 5 nM) that acts by competing for the ATP-binding site of GSK3. GSK3 is a serine/threonine kinase that is a key inhibitor of the WNT pathway; therefore BIO functions as a WNT activator. It shows some inhibitory activity against cyclin-dependent kinase (CDK) 5 (IC_{50} = 83 nM), CDK2 (IC_{50} = 300 nM), and CDK1 (IC_{50} = 320 nM), and little activity against other common kinases including MAPK, PKA, PKC, and PKG (Meijer et al.).

Molecular Name:	BIO
Alternative Names:	GSK 3 IX; MLS 2052; 6-Bromoindirubin-3'-oxime
CAS Number:	667463-62-9
Chemical Formula:	$C_{16}H_{10}BrN_3O_2$
Molecular Weight:	356.2 g/mol
Purity:	≥ 98%
Chemical Name:	6-bromo-3-[(3E)-1,3-dihydro-3-(hydroxyimino)-2H-indol-2-ylidene]-1,3-dihydro-(3Z)-2H-indol-2-one
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 ≤ 25 mM · Absolute ethanol ≤ 1.5 mM For example, to prepare a 10 mM stock solution in DMSO, resuspend 1 mg in 281 µL 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
· Maintains self-renewal of mouse embryonic stem (ES) cells in the absence of LIF (Sato et al.).
· Maintains self-renewal of human ES cells in unconditioned medium through a SMAD 2/3 dependent mechanism (James et al.; Sato et al.).
· Induces proliferation of neonatal and adult rat cardiomyocytes (Tseng et al.).
REPROGRAMMING
· Enhances reprogramming of mouse fibroblasts, neural stem cells, and thymocytes to induced pluripotent stem (iPS) cells (Lluis et al.).
DIFFERENTIATION
· Promotes differentiation of cardiomyocytes from human ES and iPS cells (Lian et al.).

References

James D et al. (2005) TGFbeta/activin/nodal signaling is necessary for the maintenance of pluripotency in human embryonic stem cells. Development 132(6): 1273–82.
Lian X et al. (2012) Robust cardiomyocyte differentiation from human pluripotent stem cells via temporal modulation of canonical Wnt signaling. Proc Natl Acad Sci USA 109(27): E1848–57.
Lluis F et al. (2008) Periodic activation of Wnt/beta-catenin signaling enhances somatic cell reprogramming mediated by cell fusion. Cell Stem Cell 3(5): 493–507.
Meijer L et al. (2003) GSK-3-selective inhibitors derived from Tyrian purple indirubins. Chem Biol 10(12): 1255–66.
Sato N et al. (2004) Maintenance of pluripotency in human and mouse embryonic stem cells through activation of Wnt signaling by a pharmacological GSK-3-specific inhibitor. Nat Med 10(1): 55–63.
Tseng A-S et al. (2006) The GSK-3 inhibitor BIO promotes proliferation in mammalian cardiomyocytes. Chem Biol 13(9): 957–63.

Related Small Molecules

For a complete list of small molecules available from STEMCELL Technologies, visit www.stemcell.com/smallmolecules or contact us at techsupport@stemcell.com.

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