

## Small Molecules

BIO

WNT pathway activator; Inhibits GSK3

Catalog # 72032  
72034

1 mg  
5 mg



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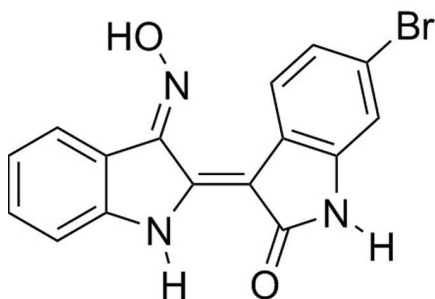
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## Product Description

BIO is an indirubin compound that is cell-permeable and is a selective, potent, and reversible inhibitor of glycogen synthase kinase (GSK) 3 $\alpha$  and GSK3 $\beta$  ( $IC_{50}$  = 5 nM) which 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 <sub>16</sub> H <sub>10</sub> BrN <sub>3</sub> O <sub>2</sub>
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. For product expiry date, please contact <a href="mailto:techsupport@stemcell.com">techsupport@stemcell.com</a> .
Solubility:	<ul style="list-style-type: none"><li>· DMSO ≤ 25 mM</li><li>· Absolute ethanol ≤ 1.5 mM</li></ul> For example, to prepare a 10 mM stock solution in DMSO, resuspend 1 mg in 281 $\mu$ 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

- 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 U S A* 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

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