Small Molecules

SB431542

Activin/BMP/TGFβ pathway inhibitor;
Inhibits ALK4, ALK5, and ALK7

Catalog #	72232	1 mg
	72234	10 mg

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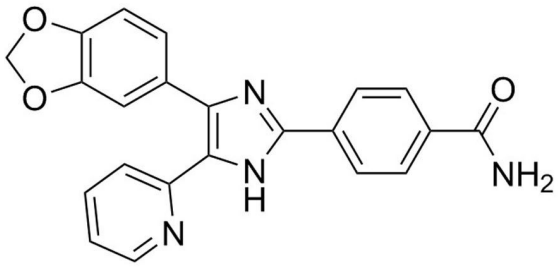
Product Description

SB431542 is a selective and potent inhibitor of the transforming growth factor (TGF)-β, Activin, and Nodal pathways. It inhibits the TGF-β type I receptors ALK5 (IC_{50} = 94 nM), ALK4 (IC_{50} = 140 nM), and ALK7 by competing for the ATP binding site. It does not inhibit the bone morphogenetic protein (BMP) type I receptors ALK2, ALK3, and ALK6 (Inman et al.; Laping et al.).

Molecular Name:	SB431542
Alternative Names:	SB-431542
CAS Number:	301836-41-9
Chemical Formula:	$C_{22}H_{16}N_4O_3$
Molecular Weight:	384.4 g/mol
Purity:	≥ 98%
Chemical Name:	4-[4-(1,3-benzodioxol-5-yl)-5-(2-pyridinyl)-1H-imidazol-2-yl]-benzamide
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:	· Absolute ethanol ≤ 5.2 mM · DMSO ≤ 50 mM For example, to prepare a 10 mM stock solution in DMSO, resuspend 1 mg in 260 µL of 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

REPROGRAMMING
· Replaces SOX2 in the reprogramming of mouse fibroblasts to induced pluripotent stem (iPS) cells (Ichida et al.).
· Increases the efficiency of reprogramming human somatic cells to iPS cells, in combination with PD0325901 (Catalog #72182) and Thiazovivin (Catalog #72252) (Lin et al.).
· Direct lineage reprogramming of fibroblasts to mature neurons, in combination with CHIR99021 (Catalog #72052), ISX-9 (Catalog #73202), Forskolin (Catalog #72112), and I-BET151 (Catalog #73712; Li et al.).
DIFFERENTIATION
· Promotes differentiation of neural progenitor cells from human pluripotent stem cells (PSCs), in combination with either LDN193189 (Catalog #72146) or Noggin (Catalog #78060) (Chambers et al. 2009; Chambers et al. 2012).
· Promotes proliferation and sheet formation of mouse embryonic stem (ES)-derived endothelial cells (Watabe et al.).
· Enhances differentiation of cardiomyocytes from mouse and human PSCs (Kattman et al.).
· Inhibits the self-renewal and causes differentiation of human PSCs, demonstrating the importance of the TGFβ/Activin/Nodal pathway in their maintenance (James et al.; Vallier et al.).

References

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Li X et al. (2015) Small-molecule-driven direct reprogramming of mouse fibroblasts into functional neurons. Cell Stem Cell 17(2): 195–203.
Lin T et al. (2009) A chemical platform for improved induction of human iPSCs. Nat Methods 6(11): 805–8.
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