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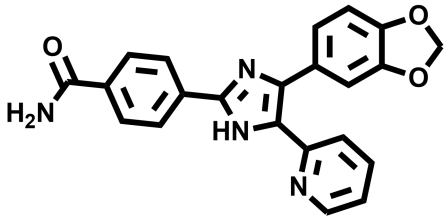
TGF-beta Inhibitor SB431542

Chemical Name: 4-(4-(benzo[d][1,3]dioxol-5-yl)-5-(pyridin-2-yl)-1H-imidazol-2-yl)benzamide



Molecular Weight:	384.39
Formula:	$C_{22}H_{16}N_4O_3$
Purity:	≥98%
CAS#:	301836-41-9
Solubility:	DMSO up to 100mM
Storage	Powder: 4°C 1 year DMSO: 4°C 3 month -20°C 1 year

Biological Activity:

SB-431542 is a potent and selective inhibitor of TGF-β type I receptors ALK5 (IC_{50} ~94 nM), ALK4 (IC_{50} ~140 nM) and ALK7. It has no activities on the other ALK family members such as ALK2, ALK3 and ALK6, nor on components of the ERK, JNK, and p38 MAP kinase pathways. It specifically blocks Smad2 signaling, modulating gene expression related to EMT. In several publications SB-431542 has been used to enhance iPSC reprogramming, induce neural differentiation of human pluripotent stem cells, and promote naïve state of pluripotent stem cells.

How to Use:

In vitro: SB-431542 was used at 10 μM concentration in cell culture.

In vivo: SB-431542 was intraperitoneally dosed to mice at 10 mg/kg once per day.

Reference:

1. Laping NJ, et al. Inhibition of transforming growth factor (TGF)-beta1-induced extracellular matrix with a novel inhibitor of the TGF-beta type I receptor kinase activity: SB-431542. (2002) Mol Pharmacol.; 62(1):58-64.
2. Inman GJ, et al. SB-431542 is a potent and specific inhibitor of transforming growth factor-β superfamily type I activin receptor-like kinase (ALK) receptors ALK4, ALK5, and ALK7. (2002) Mol Pharmacol.; 62(1):65–74.
3. Lin T, et al. A chemical platform for improved induction of human iPSCs. Nature Methods 6, 805 - 808 (2009).
4. Chambers SM, et al. Highly efficient neural conversion of human ES and iPS cells by dual inhibition of SMAD signaling. (2009) Nat Biotechnol.;27(3):275-80.
5. Li W, et al. Rapid induction and long-term self-renewal of primitive neural precursors from human embryonic stem cells by small molecule inhibitors. (2011) PNAS;108(20):8299-304
6. Chambers SM, et al. Combined small-molecule inhibition accelerates developmental timing and converts human pluripotent stem cells into nociceptors. (2012) Nat Biotechnol. In press.