产品名称：SB431542
产品别名：SB-431542

生物活性：

Description	SB-431542 is a potent and selective inhibitor of ALK5/TGF-β type I Receptor with an IC_{50} value of 94 nM.
IC_{50} & Target	ALK5
	94 nM (IC_{50})
In Vitro	SB-431542 (1 μM) significantly reduces the TGF-β-induced nuclear accumulation of Smad proteins in A498 cells. SB-431542 inhibits TGF-β1-induced collagen Iα1 and PAI-1 mRNA with IC50 values of 60 and 50 nM, respectively. In addition, SB-431542 inhibits TGF-β 1-induced fibronectin mRNA and protein with IC50 values of 62 and 22 nM, respectively[1]. SB-431542 (10 μM) is a selective inhibitor of TGF-β signaling but has no effect on BMP signaling in NIH 3T3 cells[2]. TRKI, SB-431542, inhibits TGF-beta-induced transcription, gene expression, apoptosis, and growth suppression. SB-431542 attenuates the tumor-promoting effects of TGF-beta, including TGF-beta-induced EMT, cell motility, migration and invasion, and vascular endothelial growth factor secretion in human cancer cell lines. SB-431542 induces anchorage independent growth of cells that are growth-inhibited by TGF-beta, whereas it reduces colony formation by cells that are growth-promoted by TGF-beta[3]. SB-431542 (0.3 μM) inhibits cell proliferation induced by TGF-β in MG63 cells[4].
In Vivo	SB-431542 (10 mg/kg, i.p.) decreases lung metastasis but does not significantly alter growth of the primary tumor 4T1 xenograft[5].
Solvent&Solubility	***In Vitro:***
	DMSO : ≥ 40 mg/mL (104.06 mM)
	Ethanol : 11.17 mg/mL (29.06 mM; Need ultrasonic and warming)
	* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.6015 mL	13.0076 mL	26.0152 mL
	5 mM	0.5203 mL	2.6015 mL	5.2030 mL
	10 mM	0.2602 mL	1.3008 mL	2.6015 mL

*请根据产品在不同溶剂中的溶解度选择合适的溶剂配制储备液；一旦配成溶液，请分装保存，避免反复冻融造成的产品失效。

储备液的保存方式和期限：-80°C, 6 months; -20°C, 1 month。-80°C 储存时，请在 6 个月内使用，-20°C 储存时，请在 1 个月内使用。

In Vivo:

请根据您的实验动物和给药方式选择适当的溶解方案。以下溶解方案都请先按照 **In Vitro** 方式配制澄清的储备液，再依次添加助溶剂：

——为保证实验结果的可靠性，澄清的储备液可以根据储存条件，适当保存；体内实验的工作液，建议您现用现配，当天使用； 以下溶剂前显示的百分比是指该溶剂在您配制终溶液中的体积占比；如在配制过程中出现沉淀、析出现象，可以通过加热和/或超声的方式助溶

1.请依序添加每种溶剂： 10% DMSO→40% PEG300 →5% Tween-80 → 45% saline

Solubility: ≥ 2.5 mg/mL (6.50 mM); Clear solution

此方案可获得 ≥ 2.5 mg/mL (6.50 mM，饱和度未知) 的澄清溶液。

以 1 mL 工作液为例，取 100 μL 25.0 mg/mL 的澄清 DMSO 储备液加到 400 μL PEG300 中，混合均匀；向上述体系中加入 50 μL Tween-80，混合均匀；然后继续加入 450 μL 生理盐水定容至 1 mL。

	2.请依序添加每种溶剂： 10% DMSO→ 90% (20% SBE-β-CD in saline) Solubility: ≥ 2.5 mg/mL (6.50 mM); Clear solution 此方案可获得 ≥ 2.5 mg/mL (6.50 mM，饱和度未知) 的澄清溶液。 以 1 mL 工作液为例，取 100 μL 25.0 mg/mL 的澄清 DMSO 储备液加到 900 μL 20% 的 SBE-β-CD 生理盐水水溶液中，混合均匀。
References	[1]. N. J. Laping, et al. Inhibition of Transforming Growth Factor (TGF)-β1-Induced Extracellular Matrix with a Novel Inhibitor of the TGF-β Type I Receptor Kinase Activity: SB-431542. [2]. Inman GJ, et al. SB-431542 is a potent and specific inhibitor of transforming growth factor-beta superfamily type I receptor-like kinase (ALK) receptors ALK4, ALK5, and ALK7. Mol Pharmacol, 2002, 62(1), 65-74. [3]. Halder SK, et al. A specific inhibitor of TGF-beta receptor kinase, SB-431542, as a potent antitumor agent for human cancers. Neoplasia, 2005, 7(5), 509-521. [4]. Matsuyama S, et al. SB-431542 inhibits transforming growth factor-beta-induced proliferation of human osteosarcoma cells. Cancer Res, 2003, 63(22), 7791-7798. [5]. Sato M, et al. Differential Proteome Analysis Identifies TGF-β-Related Pro-Metastatic Proteins in a 4T1 Murine Breast Cancer Model. PLoS One. 2015 May 18;10(5):e0126483. [6]. "Ma J, et al. Growth differentiation factor 11 improves neurobehavioral recovery and stimulates angiogenesis in rats subjected to cerebral ischemia/reperfusion. Brain Res Bull. 2018 Feb 9;139:38-47. "

实验参考：

Cell Assay	A498 cells are seeded at 5,000 to 10,000 cells/well in 96-well plates. The cells are serum-deprived for 24 h and then treated with SB-431542 for 48 h to assess the cellular toxicity. Cell viability is determined by incubating cells for 4 h with XTT labeling and electron coupling reagent according to the manufacturer's directions. Live cells with active mitochondria produce an orange-colored product, formazan, which is detected using a plate reader at between A 450 nm and A 500 nm with a reference wavelength greater than 600 nm. The absorbance values correlate with the number of viable cells. [1]
Animal Administration	Ten thousand 4T1 cells are injected subcutaneously into the second mammary fat pad of 6-week-old Balb/c female mice. Tumors are measured twice weekly, and volume is calculated using the following formula: Volume = width^2×length×0.52. Mice are randomly assigned to two treatment groups: control, n = 14 (20% DMSO/80% corn oil); SB-431542-treated, n = 15 (10 mg/kg body weight in 20% DMSO/80% corn oil, administered intraperitoneally three times per week starting one day after tumor cell inoculation. Primary tumors are resected when the volume at day 10 post-injection of 4T1 cells. All mice are monitored daily and euthanized after 4 weeks. The metastases are dissected to snap-freeze for further analysis. [5]
Kinase Assay	A total of 100,000 cells from each pool of A549 and HT29 are seeded into each well of 12-well plate. Cells are cultured in media containing 0.2% FBS for 18 hours, and then treated with 5 ng/mL TGF-β1 in the presence of SB-431542 (10 μM) in 0.5 mL of media for 24 hours. One hundred μLs of each supernatant media is used for VEGF assay according to the manufacturer's instruction. For TGF-β1 ELISA, 100,000 cells from each pool of A549, VMRC-LCD, and HT29 are seeded into each well of 12-well plates and serum-starved for 20 hours. Cells are then treated with SB-431542 in 0.5 mL of serum-free RPMI media for 24 hours. One hundred μLs of each supernatant media is

	activated and used for TGF-β1 assay according to the manufacturer's instruction. [3]
References	[1]. N. J. Laping, et al. Inhibition of Transforming Growth Factor (TGF)-β1-Induced Extracellular Matrix with a Novel Inhibitor of the TGF-β Type I Receptor Kinase Activity: SB-431542. [2]. Inman GJ, et al. SB-431542 is a potent and specific inhibitor of transforming growth factor-beta superfamily type I receptor-like kinase (ALK) receptors ALK4, ALK5, and ALK7. Mol Pharmacol, 2002, 62(1), 65-74. [3]. Halder SK, et al. A specific inhibitor of TGF-beta receptor kinase, SB-431542, as a potent antitumor agent for human cancers. Neoplasia, 2005, 7(5), 509-521. [4]. Matsuyama S, et al. SB-431542 inhibits transforming growth factor-beta-induced proliferation of human osteosarcoma cells. Cancer Res, 2003, 63(22), 7791-7798. [5]. Sato M, et al. Differential Proteome Analysis Identifies TGF-β-Related Pro-Metastatic Proteins in a 4T1 Murine Breast Cancer Model. PLoS One. 2015 May 18;10(5):e0126483. [6]. "Ma J, et al. Growth differentiation factor 11 improves neurobehavioral recovery and stimulates angiogenesis in rats subjected to cerebral ischemia/reperfusion. Brain Res Bull. 2018 Feb 9;139:38-47. "