# SB-431542

## TGFβ superfamily Type I activin receptor-like kinase Inhibitor

SB-431542 is a potent and selective inhibitor of the transforming growth factor-β (TGF-β) type I receptor, specifically targeting ALK4, ALK5, and ALK7. It is a cell-permeable compound that effectively inhibits SMAD2 phosphorylation, with $IC_{50}$ values of 140 nM and 94 nM for ALK4 and ALK5, respectively.

This compound is widely used in research to study TGF-β signaling pathways and has applications in various biological processes, including the suppression of TGF-β-induced proliferation in human osteosarcoma cells and the reprogramming of fibroblasts into induced pluripotent stem cells (iPSCs), as well as apoptosis and growth suppression. Additionally, SB-431542 has been shown to improve the efficiency of generating human iPSCs and is used in protocols for differentiating stem cells into specific cell types.

Key features and applications include:

- **Cancer Research:** SB-431542 is used to investigate the role of TGF-β signaling in cancer progression and metastasis. It helps in understanding how TGF-β influences tumor growth and the tumor microenvironment.
- **Stem Cell Research:** It is employed to study the differentiation of stem cells. By inhibiting TGF-β signaling, researchers can explore how stem cells differentiate into various cell types.
- **Tissue Engineering:** SB-431542 is used in tissue engineering to control the differentiation of cells and to prevent fibrosis in engineered tissues.

Relevant disease states include:

- **Fibrosis:** SB-431542 is used to study and potentially treat various fibrotic diseases. For example, it has been shown to prevent arthrofibrosis, a condition characterized by joint stiffening and scar tissue formation.
- **Muscle Injuries:** It has been used in research to reduce fibrosis and fatty infiltration in muscle injuries, such as rotator cuff tears.

- GMP format available

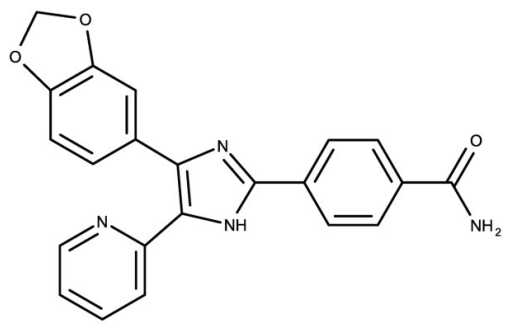
## Ordering Information

Order Online »

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|---|---|
| **ENZ-CHM331-0025** | 25mg |

## Manuals, SDS & CofA

View Online »


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## Handling & Storage

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|---|---|
| **Use/Stability** | As indicated on product label or CoA when stored as recommended. Solutions in DMSO or ethanol may be stored at -20°C for up to 3 months. |
| **Handling** | Keep container tightly closed in a dry and well-ventilated place. |
| **Short Term Storage** | Ambient |
| **Long Term Storage** | Ambient |
| **Shipping** | Ambient Temperature |

## Regulatory Status

RUO - Research Use Only

## Product Details

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|---|---|
| **Alternative Name** | 4-[4-(3,4-Methylenedioxyphenyl)-5-(2-pyridyl)-1H-imidazol-2-yl]-benzamide |
| **Appearance** | Yellow solid. |
| **CAS** | 301836-41-9 |
| **Couple Target** | Activin receptor, TGF-beta receptor |
| **Couple Type** | Inhibitor |
| **Formula** | $C_{22}H_{16}N_4O_3$ |
| **Identity** | Determined by NMR. |
| **MW** | 384.4 |
| **Purity** | ≥99% (HPLC) |
| **Solubility** | Soluble in DMSO (up to 30 mg/mL). Soluble in ethanol (up to 3 mg/mL). |



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