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## DATASHEET

SB 431542

### Product overview

|                          |                                                                                                                                                                                                                                                                             |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Name</b>              | SB 431542                                                                                                                                                                                                                                                                   |
| <b>Cat No</b>            | HB3555                                                                                                                                                                                                                                                                      |
| <b>Biological action</b> | Inhibitor                                                                                                                                                                                                                                                                   |
| <b>Purity</b>            | >98%                                                                                                                                                                                                                                                                        |
| <b>Description</b>       | Potent, selective TGF- $\beta$ RI ALK5, ALK4, ALK7 inhibitor. Induces sheet formation, proliferation, differentiation of ESC-derived endothelial cells and replaces SOX2 in reprogramming protocols. 3D growth matrix component and can be used in production of organoids. |

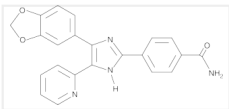
### Biological Data

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Biological description</b> | <p>Potent and selective transforming growth factor <math>\beta</math> type I receptor (TGF-<math>\beta</math>RI) activin receptor-like kinase ALK5, ALK4 and ALK7 inhibitor (<math>IC_{50}</math> = 94 nM at ALK5).</p> <p>Specifically inhibits Smad2/3 activation and blocks TGF-<math>\beta</math> signal transduction.</p> <p>Maintains the undifferentiated state of mouse embryonic stem cells (ESCs).</p> <p>Also induces sheet formation, proliferation, differentiation of ESC-derived endothelial cells.</p> <p>It additionally can be used as a 3D growth matrix component and can be used in production of organoids (e.g. brain/ blood vessel organoids).</p> <p>It can also be used to replace the SOX2 factor in reprogramming protocols.</p> |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Solubility & Handling

|                             |                                                                                                                               |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Storage instructions</b> | Room temperature                                                                                                              |
| <b>Solubility overview</b>  | Soluble in DMSO (100mM) and ethanol (10mM)                                                                                    |
| <b>Important</b>            | This product is for RESEARCH USE ONLY and is not intended for therapeutic or diagnostic use. Not for human or veterinary use. |

### Chemical Data

|                           |                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------|
| <b>Chemical name</b>      | 4-[4-(1,3-benzodioxol-5-yl)-5-(2-pyridinyl)-1H-imidazol-2-yl]-benzamide                    |
| <b>Molecular Weight</b>   | 384.4                                                                                      |
| <b>Chemical structure</b> |         |
| <b>Molecular Formula</b>  | $C_{22}H_{16}N_4O_3$                                                                       |
| <b>CAS Number</b>         | 301836-41-9                                                                                |
| <b>PubChem identifier</b> | 4521392                                                                                    |
| <b>SMILES</b>             | <chem>C1OC2=C(O1)C=C(C=C2)C3=C(NC(=N3)C4=CC=C(C(=O)N)C5=CC=CC=N5</chem>                    |
| <b>Source</b>             | Synthetic                                                                                  |
| <b>InChi</b>              | InChI=1S/C22H16N4O3/c23-21(27)13-4-6-14(7-5-13)22-25-19(20(26-22)16-3-1-2-10-24-16)15-8-9- |

|                      |                                                                         |
|----------------------|-------------------------------------------------------------------------|
| <b>Chemical name</b> | 4-[4-(1,3-benzodioxol-5-yl)-5-(2-pyridinyl)-1H-imidazol-2-yl]-benzamide |
| <b>InChiKey</b>      | 17-18(11-15)29-12-28-17/h1-11H,12H2,(H2,23,27)(H,25,26)                 |
| <b>MDL number</b>    | FHYUGAJXYORMHI-UHFFFAOYSA-N                                             |
| <b>Appearance</b>    | MFCD11045982<br>Yellow solid                                            |

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## References

### 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.

Laping et al (2002) Mol Pharmacol 62(1)

**PubMedID** [12065755](#)

### SB-431542 is a potent and specific inhibitor of transforming growth factor-beta superfamily type I ALK receptors ALK4, ALK5, and ALK7.

Inman et al (2002) Mol Pharmacol 62(1)

**PubMedID** [12065756](#)

### TGF-beta receptor kinase inhibitor enhances growth and integrity of embryonic stem cell-derived endothelial cells.

Watabe et al (2003) J Cell Biol 163(6)

**PubMedID** [14676305](#)

### Mechanism of SB431542 in inhibiting mouse embryonic stem cell differentiation.

Du et al (2014) Cell Signal 26(10)

**PubMedID** [24949833](#)

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