IDE1

Small molecule inducer of definitive endoderm

IDE1 is a small-molecule compound that promotes the differentiation of embryonic stem cells (ESCs) and induced pluripotent stem cells (iPSCs) into definitive endoderm (DE) lineages. It functions by activating the TGF-β signaling pathway, leading to Smad2 phosphorylation and increased Nodal expression. IDE1 has an EC_{50} of approximately 125 nM for inducing DE differentiation.

Key features and applications include:

- **Definitive Endoderm Induction:** Efficiently induces $Sox17^+/FoxA2^+$ endodermal progenitors from both mouse and human ESCs.
- **TGF-β Pathway Activation:** Mimics Activin A by triggering Smad2 phosphorylation, a key step in endoderm specification.
- **Cell-Permeable & Cost-Effective:** Offers a small-molecule alternative to expensive growth factors like Activin A.
- **Versatile in Culture Systems:** Effective in both 2D monolayer and 3D embryoid body (EB) differentiation protocols.
- **Pancreatic Lineage Differentiation:** When combined with FGF10, retinoic acid, or hedgehog inhibitors, IDE1-derived DE cells can further differentiate into $Pdx1^+$ pancreatic progenitors.

Research Applications:

- Stem cell differentiation protocols
- Developmental biology studies
- Pancreatic and hepatic lineage specification
- High-throughput screening for endoderm inducers

Relevant disease states include:

- **Diabetes Mellitus:** IDE1 is used in protocols to generate pancreatic β-cell precursors, aiding in diabetes research and regenerative therapy development.

- **Liver Disease:** Supports the generation of hepatocyte-like cells from pluripotent stem cells for liver disease modeling and drug screening.
- **Congenital Gut Disorders:** Enables modeling of early gut tube development and related congenital abnormalities.
- **Stem Cell Therapy Research:** Facilitates the development of cell-based therapies by providing a scalable method for generating endodermal derivatives.

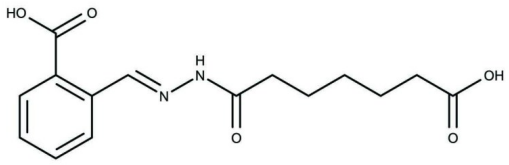
Ordering Information

Order Online »

ENZ-CHM352-0025	25mg

Manuals, SDS & CofA

View Online »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Handling & Storage

Use/Stability	As indicated on product label or CoA when stored as recommended.
Short Term Storage	-20°C
Long Term Storage	-20°C
Shipping	Ambient Temperature

Regulatory Status

RUO - Research Use Only

Product Details

Alternative Name	2-[(E)-(6-carboxyhexanoylhydrazinylidene)methyl]benzoic acid
Appearance	White solid.
CAS	1160927-48-9
Couple Target	TGF-beta
Couple Type	Activator
Formula	$C_{15}H_{18}N_2O_5$
Identity	Determined by NMR.
MW	306.32
Purity	≥98% (TLC)
Solubility	Soluble in DMSO (≥ 25 mg/mL).

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