

Product Data Sheet

Product Name: IDE 2
Cat. No.: GC10854

Chemical Properties

Cas. No. 1136466-93-7

Chemical Name (Z)-7-(cyclopentylidenehydrazono)-7-hydroxyheptanoic acid

SMILES O/C(CCCCCC(O)=O)=N\N=C1CCCC/1

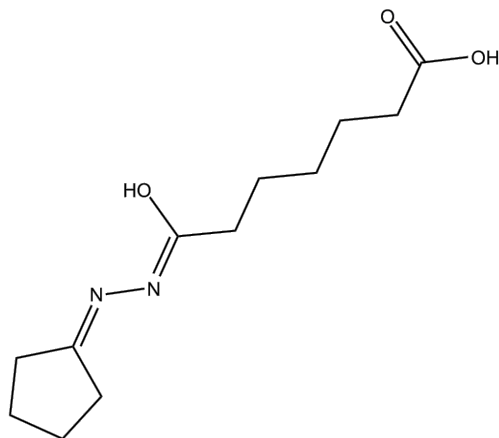
Formula $C_{12}H_{20}N_2O_3$ M.Wt 240.3

Solubility DMF: 33 mg/ml, DMF:PBS(pH 7.2) (1:1): 0.5 mg/ml, DMSO: 25 mg/ml, Ethanol: 0.1 mg/ml
Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice. All other available sizes: ship with RT, or blue ice upon request.

Structure



Protocol

Cell experiment [1]:

Caution: Product has not been fully validated for medical applications. For research use only.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

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Cell lines	human embryonic stem cells (Envy) and umbilical cord blood-derived unrestricted somatic stem cells (USSC)
Preparation Method	human embryonic stem cells and USSC were maintained in appropriate stem cell media, then treated with 200nM IDE 2 in RPMI for 4 days, after which RNA was extracted and gene expression was assessed by PCR.
Reaction Conditions	200nM; 4 days
Applications	IDE 2 upregulated Sox17 and Brachyury mRNA in human embryonic stem cells, while in USSC it did not induce Sox17 or Brachyury expression and a proportion of USSC acquired a more rounded morphology.
References:[1] Filby CE, Williamson R, van Kooy P, et al. Stimulation of Activin A/Nodal signaling is insufficient to induce definitive endoderm formation of cord blood-derived unrestricted somatic stem cells. Stem Cell Res Ther. 2011 Apr 4;2(2):16.	

Background

IDE 2 is a definitive endoderm inducer with small molecule activity and activates the TGF- β /Nodal signaling pathway. IDE 2 upregulates Sox17 and FoxA2 expression to drive human pluripotent stem cells to ectoderm-external lineage specification. IDE 2 can be used for definitive endoderm differentiation and human embryonic stem cell fate regulation studies^[1-4].

In vitro, 200nM IDE 2 was applied to umbilical cord blood-derived stem cells for 4 days and induced the stem cells to change into a round morphology and upregulate Brachyury mRNA^[5]. 1 μ M IDE 2 was applied to embryonic stem cells for 4 days and induced the cells to express definitive endoderm markers FOXA2 and SOX17^[6].

References:

- [1] Korostylev A, Mahaddalkar PU, Keminer O, et al. A high-content small molecule screen identifies novel inducers of definitive endoderm. Mol Metab. 2017 May 4;6(7):640-650.
- [2] Novakovsky G, Sasaki S, Fornes O, et al. In silico discovery of small molecules for efficient stem

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cell differentiation into definitive endoderm. Stem Cell Reports. 2023 Mar 14;18(3):765-781.

[3] Bogacheva MS, Harjumäki R, Flander E, et al. Differentiation of Human Pluripotent Stem Cells Into Definitive Endoderm Cells in Various Flexible Three-Dimensional Cell Culture Systems: Possibilities and Limitations. Front Cell Dev Biol. 2021 Sep 9;9:726499.

[4] Xu T, Zhang M, Laurent T, et al. Concise review: chemical approaches for modulating lineage-specific stem cells and progenitors. Stem Cells Transl Med. 2013 May;2(5):355-61.

[5] Borowiak M, Maehr R, Chen S, et al. Small molecules efficiently direct endodermal differentiation of mouse and human embryonic stem cells. Cell Stem Cell. 2009 Apr 3;4(4):348-58.

[6] Filby CE, Williamson R, van Kooy P, et al. Stimulation of Activin A/Nodal signaling is insufficient to induce definitive endoderm formation of cord blood-derived unrestricted somatic stem cells. Stem Cell Res Ther. 2011 Apr 4;2(2):16.

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