# Laduviglusib

**Cat. No.:** HY-10182

**CAS No.:** 252917-06-9

**Molecular Formula:** $C_{22}H_{18}Cl_2N_8$

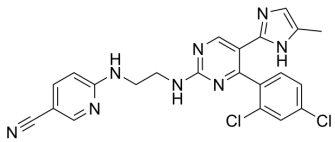
**Molecular Weight:** 465.34

**Target:** GSK-3; Autophagy; Wnt; β-catenin; Organoid

**Pathway:** PI3K/Akt/mTOR; Stem Cell/Wnt; Autophagy

**Storage:**

| | | |
|---|---|---|
| Powder | -20°C | 3 years |
| | 4°C | 2 years |
| In solvent | -80°C | 1 year |
| | -20°C | 6 months |



## SOLVENT & SOLUBILITY

**In Vitro**

DMSO : 50 mg/mL (107.45 mM; ultrasonic and warming and heat to 60°C)

| Preparing Stock Solutions | Solvent / Mass / Concentration | 1 mg | 5 mg | 10 mg |
|---|---|---|---|---|
| | 1 mM | 2.1490 mL | 10.7448 mL | 21.4897 mL |
| | 5 mM | 0.4298 mL | 2.1490 mL | 4.2979 mL |
| | 10 mM | 0.2149 mL | 1.0745 mL | 2.1490 mL |

Please refer to the solubility information to select the appropriate solvent.

**In Vivo**

1. Add each solvent one by one: 0.5% CMC-Na/saline water
   Solubility: 5 mg/mL (10.74 mM); Suspended solution; Need ultrasonic
2. Add each solvent one by one: 20% SBE-β-CD adjusted to pH 4-4.5 with 1 N acetic
   Solubility: 5 mg/mL (10.74 mM); Clear solution; Need ultrasonic
3. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (4.47 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (4.47 mM); Clear solution

## BIOLOGICAL ACTIVITY

**Description**

Laduviglusib (CHIR-99021) is a potent, selective and orally active GSK-3α/β inhibitor with $IC_{50}$s of 10 nM and 6.7 nM. Laduviglusib shows >500-fold selectivity for GSK-3 over CDC2, ERK2 and other protein kinases. Laduviglusib is also a potent Wnt/β-catenin signaling pathway activator. Laduviglusib enhances mouse and human embryonic stem cells self-renewal. Laduviglusib induces autophagy[1][2][3].

| $IC_{50}$ & Target | GSK-3β | GSK-3α | cdc2 |
|---|---|---|---|
| | 6.7 nM ($IC_{50}$) | 10 nM ($IC_{50}$) | 8800 nM ($IC_{50}$) |

**In Vitro**

Laduviglusib (1-10 μM, 3 days) reduces the viability of the ES-D3 cells with an $IC_{50}$ of 4.9 μM[2].
Laduviglusib (5 μM, 48 h) activates the canonical Wnt-pathway in ES-D3 cells and ES-CCE cells[2].
Laduviglusib (3 μM, 4 days) inhibits ES cell differentiation into neural cells[3].
Laduviglusib (1 μM, 2 weeks) inhibits adipogenesis by blocking induction of C/EBPα and PPARγ in 3T3-L1 preadipocytes[4].
Laduviglusib (2.5 μM, 24 h) protects Lgr5+ cells against radiation-induced apoptosis[5].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[2]

| | |
|---|---|
| Cell Line: | ES-D3 cells |
| Concentration: | 1-10 μM |
| Incubation Time: | 3 days |
| Result: | Reduced the viability of the ES-D3 cells by 24.7% at 2.5 μM, 56.3% at 5 μM, 61.9% at 7.5 μM and 69.2% at 10 μM |

**In Vivo**

Laduviglusib (30 mg/kg, p.o ) rapidly lowers plasma glucose[1].
Laduviglusib (2 mg/kg, i.p.) protects mice against radiation-induced lethal GI injury[5].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

| | |
|---|---|
| Animal Model: | ZDF rats[1] |
| Dosage: | 30 mg/kg |
| Administration: | Oral administration |
| Result: | Lowered plasma glucose, with a maximal reduction of nearly 150 mg/dl 3-4 h after administration. |

| | |
|---|---|
| Animal Model: | WT C57BL/6 mice[5] |
| Dosage: | 2 mg/kg |
| Administration: | Intraperitoneal injection (i.p.) |
| Result: | Blocked crypt apoptosis and increased Lgr5+ cell survival. |

## CUSTOMER VALIDATION

- Nat Med. 2016 May;22(5):547-56.
- Cell Discov. 2023 Jun 6;9(1):53.
- Nat Genet. 2024 Jan 24.
- Cell Stem Cell. 2022 Sep 1;29(9):1366-1381.e9.
- Cell Stem Cell. 2022 Jul 7;29(7):1102-1118.e8.

See more customer validations on www.MedChemExpress.com

## REFERENCES

[1]. Ring DB, et al. Selective glycogen synthase kinase 3 inhibitors potentiate activation of glucose transport and utilization in vitro and in vivo. Diabetes. 2003 Mar;52(3):588-95.

[2]. Bennett CN, et al. Regulation of Wnt signaling during adipogenesis. J Biol Chem. 2002 Aug 23;277(34):30998-1004.

[3]. Naujok O, et al. Cytotoxicity and activation of the Wnt/beta-catenin pathway in mouse embryonic stem cells treated with four GSK3 inhibitors.BMC Res Notes. 2014 Apr 29;7:273.

[4]. Wang X, et al. Pharmacologically blocking p53-dependent apoptosis protects intestinal stem cells and mice from radiation. Sci Rep. 2015 Apr 10;5:8566.

[5]. Ye S, et al. Pleiotropy of glycogen synthase kinase-3 inhibition by CHIR99021 promotes self-renewal of embryonic stem cells from refractory mouse strains. PLoS One. 2012;7(4):e35892.



Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA