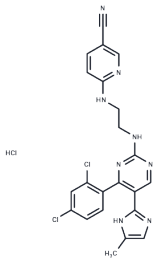
Data Sheet (Cat.No.T2310L)

TargetMol

CHIR-99021 HCl

Chemical Properties



CAS No. : 1797989-42-4

Formula: C22H19Cl3N8

Molecular Weight: 501.8

Storage: Keep away from direct sunlight,Store under nitrogen
Pure form: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

Description	CHIR-99021 HCl (Laduviglusib HCl) is a highly potent and selective inhibitor of GSK-3α/β, with IC50 values of 10 nM and 6.7 nM respectively. It demonstrates remarkable selectivity for GSK-3, with over 500-fold selectivity over CDC2, ERK2, and other protein kinases. Additionally, CHIR-99021 HCl serves as a robust activator of the Wnt/β-catenin signaling pathway. Moreover, it exhibits the ability to enhance self-renewal in both mouse and human embryonic stem cells. Furthermore, CHIR-99021 HCl induces autophagy [1] [2] [3].
Targets(IC50)	Autophagy,GSK-3,Wnt/beta-catenin
In vitro	Laduviglusib monohydrochloride is a potent inhibitor of human GSK-3β, demonstrating a K_i value of 9.8 nM. As a small organic molecule, it competitively inhibits GSK3α and GSK3β by binding to their ATP-binding sites. Kinase assay results reveal that Laduviglusib monohydrochloride specifically targets GSK3β (IC 50 =~5 nM) and GSK3α (IC 50 =~10 nM) with minimal impact on other kinases. Studies show that at concentrations of 2.5 μM to 10 μM, Laduviglusib monohydrochloride significantly reduces the viability of ES-D3 cells in a dose-dependent manner, with an IC 50 of 4.9 μM, indicating a substantial reduction in cell viability at these concentrations.
In vivo	In ZDF rats, administering a single oral dose of Laduviglusib monohydrochloride, either 16 mg/kg or 48 mg/kg, swiftly lowers plasma glucose levels, achieving a peak reduction of approximately 150 mg/dl within 3-4 hours post-dose [1]. Additionally, a one-time administration of Laduviglusib (2 mg/kg) monohydrochloride, 4 hours prior to exposure, markedly enhances survival rates following 14.5 Gy abdominal irradiation (ABI). This treatment significantly inhibits crypt cell apoptosis and the buildup of p-H2AX + cells, while fostering crypt regeneration and increasing villus height. Furthermore, Laduviglusib monohydrochloride enhances the survival of Lgr5 + cells by preventing apoptosis and effectively halts the early reduction of Olfm4, Lgr5, and CD44 markers, observable as soon as 4 hours post-treatment [5].

Solubility Information

Solubility	DMSO: 60 mg/mL (119.57 mM),Sonication is recommended. H2O: 6.4 mg/mL (12.75 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween-80+45% Saline: 2.5 mg/mL (4.98 mM),Sonication is recommended. *Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	1.9928 mL	9.9641 mL	19.9283 mL
5 mM	0.3986 mL	1.9928 mL	3.9857 mL
10 mM	0.1993 mL	0.9964 mL	1.9928 mL
50 mM	0.0399 mL	0.1993 mL	0.3986 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

Ring DB, et al. Selective glycogen synthase kinase 3 inhibitors potentiate insulin activation of glucose transport and utilization in vitro and in vivo. Diabetes. 2003 Mar;52(3):588-95.
Xu C, Zhao W, Peng L, et al.PRDM14 extinction enables the initiation of trophoblast stem cell formation.Cellular and Molecular Life Sciences.2024, 81(1): 208.
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.
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.
Bennett CN, et al. Regulation of Wnt signaling during adipogenesis. J Biol Chem. 2002 Aug 23;277(34):30998-1004.
Wang X, et al. Pharmacologically blocking p53-dependent apoptosis protects intestinal stem cells and mice from radiation. Sci Rep. 2015 Apr 10;5:8566.