Pioglitazone

Cat. No.: HY-13956

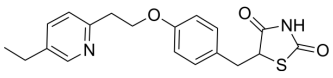
CAS No.: 111025-46-8

Molecular Formula: $C_{19}H_{20}N_2O_3S$

Molecular Weight: 356.44

Target: PPAR; Ferroptosis

Pathway: Cell Cycle/DNA Damage; Metabolic Enzyme/Protease; Vitamin D Related/Nuclear Receptor; Apoptosis



Storage:

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

SOLVENT & SOLUBILITY

In Vitro

DMSO : 25 mg/mL (70.14 mM; ultrasonic and warming and heat to 60°C)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.8055 mL	14.0276 mL	28.0552 mL
	5 mM	0.5611 mL	2.8055 mL	5.6110 mL
	10 mM	0.2806 mL	1.4028 mL	2.8055 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: 10 mg/mL (28.06 mM); Suspened solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: 2.08 mg/mL (5.84 mM); Suspended solution; Need ultrasonic
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (5.84 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Pioglitazone (U 72107) is an orally active and selective PPARγ (peroxisome proliferator-activated receptor) agonist with high affinity binding to the PPARγ ligand-binding domain with EC_{50} of 0.93 and 0.99 μM for human and mouse PPARγ, respectively. Pioglitazone can be used in diabetes research[2][3][4].

IC_{50} & Target	hPPARγ	mouse PPARγ	hPPARδ	hPPARα
	0.93 μM (EC50)	0.99 μM (EC50)	43 μM (EC50)	100 μM (EC50)

	mouse PPARα 100 μM (EC50)
In Vitro	Pioglitazone (0.5 or 1 μM, 5 days) can completely prevent AGEs (advanced glycation end-products)-induced β-cell necrosis and the increase of caspase-3 thereby avoiding the impaired viability caused by AGEs in pancreatic beta cell line HIT-T15[2]. ?Pioglitazone (1 μM, 1 h) can stimulate insulin secretion induced by low glucose concentration and attenuate the GSSG/GSH ratio in cells cultured with AGEs[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Pioglitazone (oral gavage, 10 or 30 mg/kg, once daily, 14 days) can induce improvements in insulin resistance and diabetes that may be lipocalin-dependent in the liver but not in skeletal muscle[3]. ?Pioglitazone (oral gavage, 10 mg/kg, once daily, 4 weeks) can significantly reduce body weight (BW), cardiac hypertrophy, elevated blood glucose levels and improve the associated dyslipidemia[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	ob/ob and adipo$^{-/-}$ ob/ob mice with a C57Bl/6 background[3]
Dosage:	10 or 30 mg/kg
Administration:	Oral gavage; once daily; 14 days
Result:	Showed no changes of serum-free fatty acid and triglyceride levels as well as adipocyte sizes in ob/ob and adipo$^{-/-}$ ob/ob C57BL/6 mice at 10 mg/kg but significantly reduced to a similar degree at 30 mg/kg. Also showed no changes of expressions of TNFα and resistin in adipose tissues of ob/ob and adipo$^{-/-}$ ob/ob mice at 10 mg/kg but decreased at 30 mg/kg.

Animal Model:	Male Wistar albino rats[4]
Dosage:	10 mg/kg
Administration:	Oral gavage; once daily; 4 weeks
Result:	Decreased the elevated serum levels of both creatinine and creatine kinase-MB (CK-MB), TGF-β1 gene expression and regulated the expression of MMP-2/TIMP-2 system.

CUSTOMER VALIDATION

- Cell Metab. 2021 Mar 2;33(3):581-597.e9.
- Cell Stem Cell. 2022 Sep 1;29(9):1366-1381.e9.
- Gut Microbes. 2022, 14(1): 2139978.
- Cancer Res. 2022 Apr 15;82(8):1503-1517.
- Acta Pharmacol Sin. 2021 Jan;42(1):160-170.

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REFERENCES

[1]. Kuwabara K, et al. A novel selective peroxisome proliferator-activated receptor alpha agonist, 2-methyl-c-5-[4-[5-methyl-2-(4-methylphenyl)-4-oxazolyl]butyl]-1,3-

dioxane-r-2-carboxylic acid (NS-220), potently decreases plasma triglyceride and glucose leve

[2]. Puddu A, et al. Pioglitazone attenuates the detrimental effects of advanced glycation end-products in the pancreatic beta cell line HIT-T15. Regul Pept. 2012 Aug 20;177(1-3):79-84.

[3]. Kubota N, et al. Pioglitazone ameliorates insulin resistance and diabetes by both adiponectin-dependent and -independent pathways. J Biol Chem. 2006 Mar 31;281(13):8748-55.

[4]. Elrashidy RA, et al. Pioglitazone attenuates cardiac fibrosis and hypertrophy in a rat model of diabetic nephropathy. J Cardiovasc Pharmacol Ther. 2012 Sep;17(3):324-33.

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