Pyrintegrin

Cat. No.: HY-13306

CAS No.: 1228445-38-2

Molecular Formula: $C_{23}H_{25}N_5O_3S$

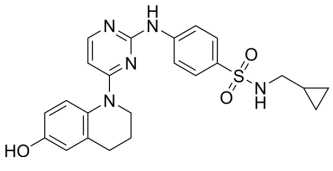
Molecular Weight: 451.54

Target: Integrin

Pathway: Cytoskeleton

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 : 250 mg/mL (553.66 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.2146 mL	11.0732 mL	22.1464 mL
	5 mM	0.4429 mL	2.2146 mL	4.4293 mL
	10 mM	0.2215 mL	1.1073 mL	2.2146 mL

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

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (4.61 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (4.61 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Pyrintegrin is an β1-integrin agonist and a 2,4-disubstituted pyrimidine that promotes embryonic stem cells survival. Pyrintegrin enhances cell-extracellular matrix (ECM) adhesion-mediated integrin signaling. Pyrintegrin can be used as a podocyte-protective agent and has robustly adipogenic[1][2][3].

IC_{50} & Target

β1-integrin[2]

In Vitro

Pyrintegrin (0-10 μM; 1 hour; hASCs) treatment inhibits BMP4-mediated phosphorylation of BMP responsive SMAD1/5 in a dose-dependent manner (IC_{50}?of?1.14?μM)[1].
?In vitro, Pyrintegrin stimulats human adipose stem/progenitor cells (hASCs) to differentiate into lipid-laden adipocytes by upregulating peroxisome proliferator-activated receptor (PPARγ) and CCAAT/enhancer-binding protein-α (C/EBPα), with

differentiated cells increasingly secreting adiponectin, leptin, glycerol and total triglycerides. Pyrintegrin attenuates Runx2 and Osx via BMP-mediated SMAD1/5 phosphorylation[1].
?Treatment with Pyrintegrin prevents damage-induced decreases in F-actin stress fibers, focal adhesions, and active β1-integrin levels in cultured cells[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Western Blot Analysis

Cell Line:	Human adipose stem/progenitor cells (hASCs)[2]
Concentration:	0 μM, 0.2 μM, 0.5 μM, 1 μM, 2 μM, 5 μM, 10 μM
Incubation Time:	1 hour
Result:	Inhibited BMP4-mediated phosphorylation of BMP responsive SMAD1/5 in a dose-dependent manner.

In Vivo

Pyrintegrin (10 mg/kg; intraperitoneal injection; once; C57BL/6J mice) treatment protects mice from LPS-induced podocyte foot process effacement and proteinuria. Analysis of the murine glomeruli shows that LPS administration reduces the levels of active β1 integrin in the podocytes, which is prevented by cotreatment with Pyrintegrin[2].
?In rats, Pyrintegrin reduces peak proteinuria caused by puromycin aminonucleoside-induced nephropathy[2].
?Pyrintegrin induces postnatal adipose tissue formation in vivo of transplanted adipose stem/progenitor cells (ASCs) and recruited endogenous cells. In vivo, Pyrintegrin-treated human adipose stem/progenitor cells (ASCs) in 3D-bioprinted scaffolds, when transplanted in the dorsum of athymic mice, yielded ectopically formed adipose tissue that expressed human PPARγ. Remarkably, Pyrintegrin-adsorbed collagen gel implanted in the inguinal fat pad promoted adipogenesis formed by host endogenous cells, suggesting its ability to induce in situ adipogenesis without the need for cell transplantation[1].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Female wild type C57BL/6J mice (10-week-old) injected with LPS[2]
Dosage:	10 mg/kg
Administration:	Intraperitoneal injection; once
Result:	Provided a significant protection for these animals from LPS-induced proteinuria and foot processe (FP) effacement.

CUSTOMER VALIDATION

- Mol Ther. 2023 Feb 28;S1525-0016(23)00116-8.
- Biomed Pharmacother. 2023 Sep 1;166:115394.

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REFERENCES

[1]. Shah BS, et al. Pyrintegrin Induces Soft Tissue Formation by Transplanted or Endogenous Cells. Sci Rep. 2017 Jan 27;7:36402.

[2]. Lee HW, et al. A Podocyte-Based Automated Screening Assay Identifies Protective Small Molecules. J Am Soc Nephrol. 2015 Nov;26(11):2741-52.

[3]. Xu Y, et al. Revealing a core signaling regulatory mechanism for pluripotent stem cell survival and self-renewal by small molecules. Proc Natl Acad Sci U S A. 2010 May

4;107(18):8129-34.

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