Mirodenafil

Cat. No.: HY-14930

CAS No.: 862189-95-5

Molecular Formula: $C_{26}H_{37}N_5O_5S$

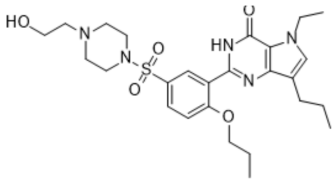
Molecular Weight: 531.67

Target: Phosphodiesterase (PDE); Glucocorticoid Receptor; Wnt; β-catenin; Apoptosis

Pathway: Metabolic Enzyme/Protease; Immunology/Inflammation; Vitamin D Related/Nuclear Receptor; Stem Cell/Wnt; Apoptosis

Storage:

Powder	-20°C	3 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

DMSO : 125 mg/mL (235.11 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	1.8809 mL	9.4043 mL	18.8087 mL
	5 mM	0.3762 mL	1.8809 mL	3.7617 mL
	10 mM	0.1881 mL	0.9404 mL	1.8809 mL

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

BIOLOGICAL ACTIVITY

Description

Mirodenafil (SK3530) is an orally active, potent, reversible, and selective phosphodiesterase 5 (PDE5) inhibitor. Mirodenafil is a glucocorticoid receptor (GR) modulator Mirodenafil activates the Wnt/β-catenin signaling pathway by downregulating Dkk1 expression. Mirodenafil can be used for the research of erectile dysfunction (ED), Alzheimer's disease (AD) and systemic sclerosis (SSc)[1][2][3].

IC_{50} & Target

PDE5

In Vitro

Mirodenafil (0-40 μM, 24 h) exerts neuroprotective functions via activating the cGMP/PKG/CREB signaling pathway[2].
Mirodenafil (0-40 μM, 24 h) enhances neuronal survival by protecting the mitochondrial membrane potential and inhibiting apoptosis[2].
Mirodenafil (0-40 μM) inhibits GSK-3β signaling, resulting in reduced tau phosphorylation, decreased Aβ production by inhibiting amyloidogenesis and activating the autophagosomal pathway[2].
Mirodenafil inhibits the transcriptional activity of the glucocorticoid receptor (GR), and inhibits homodimerization of GR in HT-22 cells[2].
Mirodenafil (0-100 μM, 24 h) inhibits TGF-β-induced phosphorylation of Smad2/3 and mRNA expression of the fibrosis

marker in fibroblasts[3].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Western Blot Analysis[2]

Cell Line:	SH-SY5Y human neuroblastoma cells
Concentration:	0, 10, 20, 40 μM
Incubation Time:	24 h
Result:	Significantly increased cGMP levels by about 200% in a dose-dependent manner. Reversed the Aβ-induced decrease in phosphorylated CREB in a dose-dependent manner. $A\beta_{42}$ alone increased the levels of cleaved caspase-3 and cleaved PARP, whereas the combined treatment with mirodenafil markedly reduced the expression levels of both apoptotic markers.

RT-PCR[3]

Cell Line:	NIH3T3 mouse embryonic fibroblasts
Concentration:	0, 10, 100 μM
Incubation Time:	24 h
Result:	The mRNA expression of COL1A1, α-SMA, and CTGF were induced by treatment with TGF-β1, and Mirodenafil significantly reduced the expression of these profibrotic genes.

In Vivo

Mirodenafil (4 mg/kg, IP, daily for 4 weeks) enhances the cognitive-behavioral performance in transgenic AD mice[2].

Mirodenafil (0-10 mg/kg, Orally, daily for 3 weeks) ameliorates dermal fibrosis in a BLM-induced SSc mouse model by inhibiting the TGF-β signaling pathway, thereby suppressing the expression of collagen and profibrotic genes[3].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	APP-C105 transgenic mice (13-month-old, male, n=6)[2]
Dosage:	4 mg/kg
Administration:	IP, daily for 4 weeks
Result:	Improved cognitive function in the APP-C105 AD mice.

Animal Model:	Male BALB/c mice (8 weeks old, four groups, n=10/group)[3]
Dosage:	0, 5 or 10 mg/kg
Administration:	Orally, daily for 3 weeks
Result:	Ameliorated dermal fibrosis and downregulated the protein levels of fibrosis markers including COL1A1 and α-SMA in the BLM-induced SSc mouse model. Significantly decreased dermal thickness and collagen content.

REFERENCES

[1]. Park HJ, et al. Mirodenafil for the treatment of erectile dysfunction: a systematic review of the literature. World J Mens Health. 2014 Apr;32(1):18-27.

[2]. Kang BW, et al. Phosphodiesterase 5 inhibitor mirodenafil ameliorates Alzheimer-like pathology and symptoms by multimodal actions. Alzheimers Res Ther. 2022 Jul

8;14(1):92.

[3]. Roh JS, et al. Mirodenafil ameliorates skin fibrosis in bleomycin-induced mouse model of systemic sclerosis. Anim Cells Syst (Seoul). 2021 Nov 3;25(6):387-395.

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