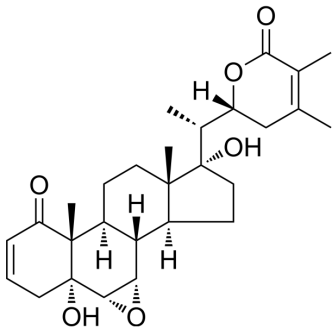
Withanone

Cat. No.:	HY-129692
CAS No.:	27570-38-3
Molecular Formula:	$C_{28}H_{38}O_6$
Molecular Weight:	470.6
Target:	iGluR
Pathway:	Membrane Transporter/Ion Channel; Neuronal Signaling
Storage:	Powder -20°C 3 years 4°C 2 years In solvent -80°C 6 months -20°C 1 month



BIOLOGICAL ACTIVITY

Description	Withanone is an active constituent from Withania somnifera roots with multifunctional neuroprotective effect in alleviating cognitive dysfunction. Withanone affords protection against N-methyl-D-aspartate (NMDA)-induced excitotoxicity in Neuron-like cells[1][2].
IC_{50} & Target	NMDA Receptor
In Vitro	Withanone (5-20 μM; Neuro2a cells) treatment significantly reverses the cell death induced by NMDA in N2a cells[1]. Withanone (5-20 μM; Neuro2a cells) treatment significantly normalizes Bax and Bcl-2 levels[1]. Attenuation of NMDA-induced intracellular calcium releases by Withanone in N2a cells[1]. Withanone attenuates NMDA-induced Reactive Oxygen Species generation in N2a cells and induces attenuation of mitochondrial membrane motential loss[1]. Withanone treatment down-regulates the expression of cytochrome c[1]. Withanone treatment decteases the Malondialdehyde levels in NMDA-induced excitotoxicity[1]. Withanone shows promise in Alzheimer's disease (AD) treatment because of cognitive benefits and more importantly, mechanisms of action with respect to the fundamental pathophysiology of the disease, not limited to the inhibition of AChE, but also include the modification of Aβ processing, protection against oxidative stress and anti-inflammatory effects. Withanone (24 hours) treatment shows significant protective effect against amyloid β (Aβ) toxicity in Aβ induced toxicity in PC-12 cells[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[1]

Cell Line:	Neuro2a (N2a) cells
Concentration:	5 μM, 10 μM, 20 μM
Incubation Time:	
Result:	Attenuated NMDA-Induced cell death in N2a cells.

Western Blot Analysis[1]

Cell Line:	Neuro2a (N2a) cells

Concentration:	5 μM, 10 μM, 20 μM
Incubation Time:	
Result:	Normalized NMDA-induced alterations in Bax and Bcl-2.

In Vivo

Withanone (5-20 mg/kg; oral administration; daily; for 21 days; male Wistar rats) treatment shows significant improvement in the cognitive skill by inhibiting amyloid β-42 and attenuates the elevated levels of pro-inflammatory cytokines like TNF α, IL-1β, IL-6, MCP-1, Nitric oxide, lipid peroxidation and both β- and γ- secretase enzymatic activity. Administration of Withanone also significantly reverses the decline in acetyl choline and Glutathione (GSH) activity[1].

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

Animal Model:	Male Wistar rats (20-24 weeks; 320-360 g) received ICV injection of STZ[1]
Dosage:	5 mg/kg, 10 mg/kg and 20 mg/kg
Administration:	Oral administration; daily; for 21 days
Result:	Showed significant improvement in the cognitive skill by inhibiting amyloid β-42 and attenuated the elevated levels of pro-inflammatory cytokines like TNF alpha, IL-1β, IL-6, MCP-1, Nitric oxide, lipid peroxidation and both β- and γ- secretase enzymatic activity. Also significantly reversed the decline in acetyl choline and Glutathione (GSH) activity.

REFERENCES

[1]. Pandey A, et al. Multifunctional neuroprotective effect of Withanone, a compound from Withania somnifera roots in alleviating cognitive dysfunction. Cytokine. 2018 Feb;102:211-221.

[2]. Dar NJ, et al. Withanone, an Active Constituent from Withania somnifera, Affords Protection Against NMDA-Induced Excitotoxicity in Neuron-Like Cells. Mol Neurobiol. 2017 Sep;54(7):5061-5073.

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