Product Datasheet

Methyllycaconitine citrate

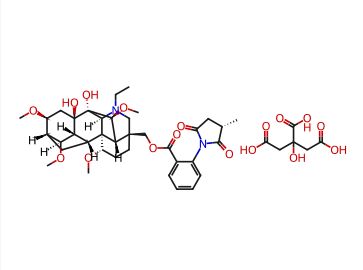
Catalog No. **BP-08976** · CAS **351344-10-0** · Form **free base** · Physical state **solid** · Version **1.0** · Revision **2026-11-13**

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Target	Research area
nAChR; Autophagy; Reactive Oxygen Species (ROS); mTOR	**Neurological Disease**

Molecular formula	$C_{43}H_{58}N_2O_{17}$
Molecular weight	**874.9340**

STRUCTURE



DESCRIPTION

Methyllycaconitine (MLA) citrate is a blood-brain barrier-permeable antagonist of α7 nicotinic acetylcholine receptor (α7nAChR) with an IC50 of 2 nM. Methyllycaconitine citrate inhibits Aβ25-35-induced autophagy by restoring the mTOR pathway, and prevents reactive oxygen species (ROS) production, microglial activation, reduced dopamine uptake, loss of dopaminergic terminals and catecholamine secretion. Methyllycaconitine citrate induces hippocampal glutamate efflux, enhances long-term potentiation, and improves memory acquisition. Methyllycaconitine citrate can be used in research related to Alzheimer's disease, cerebral palsy, Parkinson's disease and schizophrenia .

BIOLOGICAL ACTIVITY

In Vitro

Aβ/Tau/α-Synuclein Aggregation

Methyllycaconitine (2.5-20 μM; 24 h) shows no cytotoxicity against SH-SY5Y cells and alleviates Aβ25-35-induced cytotoxicity in SH-SY5Y cells[1].

Autophagy

Methyllycaconitine (5 μM) inhibits Aβ25-35-induced autophagy in SH-SY5Y cells by reducing LC3-II accumulation, autophagosome formation, and acidic vacuole formation[1].

Others

Methyllycaconitine (5 μM) inhibits Aβ25-35-induced autophagy in SH-SY5Y cells by restoring mTOR pathway activity[1].

Methyllycaconitine (0.1 μM; 40 min) inhibits the methamphetamine-induced suppression of [3H]dopamine uptake in mouse striatal synaptosomes without altering the basal uptake level[2].

Methyllycaconitine (5 nM-50 μM; 3 min) does not alter vesicular uptake of [3H]dopamine in isolated mouse striatal

synaptic vesicles[2].

Methyllycaconitine (1 nM; 2 min) potently inhibits agonist responses of human α7 nicotinic acetylcholine receptors heterologously expressed in Xenopus laevis oocytes, reducing the normalized response to 3.4% at a concentration of 1 nM[3].

Methyllycaconitine potently competes with [125I]α-bungarotoxin for binding to α7 nicotinic acetylcholine receptors in rat brain, with an IC50 of 0.01 μM[3].

Methyllycaconitine inhibits nicotine-induced catecholamine secretion in bovine adrenal cells expressing α3β4 nicotinic acetylcholine receptors, with an inhibition rate of approximately 95%[3].

In Vivo

Others

Methyllycaconitine (6 mg/kg; i.p.; single administration) inhibits methamphetamine-induced climbing behavior in male Swiss CD-1 mice by 50%[2].

Methyllycaconitine (0.003-0.1 mg/kg; i.p.; single administration) significantly enhances the long-term memory acquisition ability of healthy male Wistar rats in the object recognition task (ORT) with a 24 h retention period[4].

Innate Immunity

Methyllycaconitine (6 mg/kg; i.p.; administered 4 times total) attenuates Methamphetamine-induced loss of striatal dopaminergic terminals in male Swiss CD-1 mice by partially restoring the levels of dopamine transporter and tyrosine hydroxylase[2].

Glutamate Release or Receptors

Methyllycaconitine (1.0 mg/kg; i.p.; single administration) significantly increases glutamate efflux in the hippocampus of healthy male Sprague Dawley rats, with the effect starting at 30 min post-injection and lasting for at least 2 h[4].

REFERENCES

[1]. Zheng X, et al. Methyllycaconitine alleviates amyloid-β peptides-induced cytotoxicity in SH-SY5Y cells. PloS one. 2014;9(10):e111536.

[2]. Escubedo E, et al. Methyllycaconitine prevents methamphetamine-induced effects in mouse striatum: involvement of alpha7 nicotinic receptors. The Journal of pharmacology and experimental therapeutics. 2005 Nov;315(2):658-67.

[3]. Qasem AMA, et al. Synthesis and Antagonist Activity of Methyllycaconitine Analogues on Human α7 Nicotinic Acetylcholine Receptors. ACS bio & med chem Au. 2023 Apr 19;3(2):147-157.

[4]. van Goethem NP, et al. Antagonizing α7 nicotinic receptors with methyllycaconitine (MLA) potentiates receptor activity and memory acquisition. Cellular signalling. 2019 Oct;62:109338.