Data Sheet (Cat.No.T206266)

TargetMol

MPTP

Chemical Properties

CAS No. : 28289-54-5

Formula: C12H15N

Molecular Weight: 173.25

Storage: Keep away from direct sunlight
Powder: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

Description	MPTP is a dopaminergic neurotoxic substance capable of penetrating the blood-brain barrier, commonly used to establish Parkinson's disease animal models. As an upstream precursor of MPP^+, MPTP further mediates neuronal apoptosis.
Targets(IC50)	Apoptosis,Dopamine Receptor
In vitro	Methods: Mouse phrenic nerve-diaphragm preparations were used as the research model. Preconditioning was performed with 50 mM 4-phenylpyridine. The half-maximal inhibitory concentration (IC_{50}) of MPTP and d-tubocurarine on twitch amplitude was determined respectively, and the pharmacological differences before and after pretreatment were compared. Results: Following pretreatment with 50 mM 4-phenylpyridine, the IC_{50} of MPTP for inhibiting twitch amplitude decreased from 53 mM to 18 mM in mouse phrenic nerve-diaphragm preparations; meanwhile, the IC_{50} of d-tubocurarine decreased from 0.7 mM to 0.3 mM. These Results: indicate that 4-phenylpyridine markedly enhances the inhibitory activity of both drugs [2].
In vivo	Methods: An animal model of Parkinson's disease was established using MPTP. Based on the characteristics of MPTP-induced neural injury, the pathological mechanisms underlying dopaminergic neuronal degeneration, mitochondrial dysfunction and neuroinflammation were explored. Meanwhile, the in vivo metabolic process of MPTP was determined, and the half-life of its metabolite MPP^+ in ovine serum was analyzed. Results: MPTP is a classic modeling agent for establishing Parkinson's disease animal models and can mimic naturally occurring neurodegenerative pathological changes. It is suitable for investigating the mechanisms related to dopaminergic neuronal damage, mitochondrial dysfunction and neuroinflammation. After entering the body, MPTP is rapidly metabolized into MPP^+, which exhibits a half-life of approximately 6 days in ovine serum.

Solubility Information

Solubility	DMSO: 40.00 mg/mL (230.88 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	5.772 mL	28.860 mL	57.7201 mL
5 mM	1.1544 mL	5.772 mL	11.544 mL
10 mM	0.5772 mL	2.886 mL	5.772 mL
50 mM	0.1154 mL	0.5772 mL	1.1544 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

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Sun XL, et al. Gas1 up-regulation is inducible and contributes to cell apoptosis in reactive astrocytes in the substantia nigra of LPS and MPTP models. J
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Jackson-Lewis V, Przedborski S. Protocol for the MPTP mouse model of Parkinson's disease. Nat Protoc. 2007;2(1): 141-51.
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Lee, et al. MPTP-driven NLRP3 inflammasome activation in microglia plays a central role in dopaminergic neurodegeneration. Cell Death Differ. 2019 Jan;26(2):213-228.
Zhang QS, et al. Reassessment of subacute MPTP-treated mice as animal model of Parkinson's disease. Acta Pharmacol Sin. 2017 Oct;38(10):1317-1328.
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