MPTP hydrochloride

Cat. No.: HY-15608

CAS No.: 23007-85-4

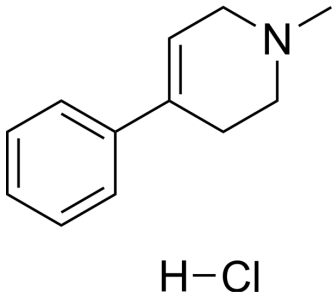
Molecular Formula: $C_{12}H_{16}ClN$

Molecular Weight: 209.72

Target: Dopamine Receptor; Apoptosis

Pathway: GPCR/G Protein; Neuronal Signaling; Apoptosis

Storage: 4°C, sealed storage, away from moisture
* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 12 mg/mL (57.22 mM; Need ultrasonic and warming)
H_2O : 10 mg/mL (47.68 mM; Need ultrasonic)

Preparing Stock Solutions	Concentration / Solvent / Mass	1 mg	5 mg	10 mg
	1 mM	4.7683 mL	23.8413 mL	47.6826 mL
	5 mM	0.9537 mL	4.7683 mL	9.5365 mL
	10 mM	0.4768 mL	2.3841 mL	4.7683 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 100 mg/mL (476.83 mM); Clear solution; Need ultrasonic and warming and heat to 60°C
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 1.67 mg/mL (7.96 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 1.67 mg/mL (7.96 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 1.67 mg/mL (7.96 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

MPTP hydrochloride is a brain penetrant dopamine neurotoxin, inducing Parkinson's Disease. MPTP hydrochloride, a precusor of MPP^+, induces apoptosis[1][2][3].

In Vitro

Pretreatment with 50 mM 4-phenylpyridine, reduces IC_{50} (concentration for 50% inhibition of twitch amplitude) values of MPTP from 53 to 18 mM and d-tubocurarine from 0.7 to 0.3 mM, respectively, in mouse phrenic nerve-diaphragm[2].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo	MPTP hydrochloride can be used in animal modeling to build Parkinson's syndrome models. The toxic effect of MPTP can be completely abolished in vivo by treatment with a monoamine oxidase inhibitor and potentiated by an inhibitor of catechol-O-methyltransferase[1]. Gas1 expressions are significantly elevated in the majority of the reactive astrocytes of the brains with LPS or MPTP insults in animal models[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration [3]	For the preparation of the LPS rat model and the MPTP mouse model, the treatments of the animals are performed. Briefly, adult rats receive unilateral injections of LPS (0.5 μL of 10 μg/μL diluted in 0.9% saline) into the medial forebrain bundle (MFB) at the following coordinates, AP-4.2 mm, L 1.5 mm, and V 7.8 mm, and into the contralateral side with the same volume of 0.9% saline. Adult mice are administered intraperitoneal injections of MPTP of 25 mg/kg per day for five continuous days, and the same volume of saline is injected as a control. All the animals are sacrificed at week 1, 2, 3, or 4 after the LPS or MPTP injections. The brain samples are collected for the subsequent immunohistochemistry and western blot experiments. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Signal Transduct Target Ther. 2021 Feb 24;6(1):77.
- Cell Death Dis. 2021 Feb 15;12(2):181.
- Cell Death Dis. 2019 Dec 16;10(12):952.
- Cell Death Discov. 2022 May 20;8(1):267.
- Int J Pharm. 2020 Mar 15;577:119053.

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REFERENCES

[1]. Langston J W, Irwin I. MPTP Neurotoxicity: An Overview and Characterization of Phases of Toxicity. II. Selective Accumulation of MPP in the Substantia Nigra: A Key to Neurotoxicity (Question). Life Sci., 1985, 36, No. 3, 201-12.

[2]. Hsu K S, et al. Potentiation of MPTP by 4-Phenylpyridine on the Neuromuscular Blockade in Mouse Phrenic Nerve-Diaphragm. Neuropharmacology, 1993, 32, No. 9, 877-83.

[3]. 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 Neuroinflammation. 2016 Jul 8;13(1):180.

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