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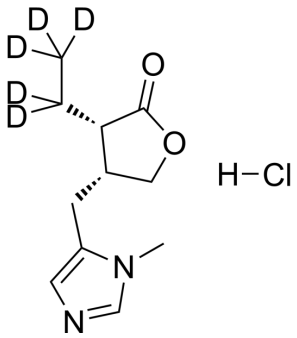
Pilocarpine-d_5 hydrochloride

Cat. No.:	HY-B0726S1
Molecular Formula:	$C_{11}H_{12}D_5ClN_2O_2$
Molecular Weight:	249.75
Target:	mAChR; Isotope-Labeled Compounds
Pathway:	GPCR/G Protein; Neuronal Signaling; Others
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description	Pilocarpine-d_5 hydrochloride is deuterated labeled Pilocarpine hydrochloride (HY-B0726). Pilocarpine Hydrochloride is a potent M3-type muscarinic acetylcholine receptor (M3 muscarinic receptor) agonist.
In Vitro	Stable heavy isotopes of hydrogen, carbon, and other elements have been incorporated into drug molecules, largely as tracers for quantitation during the drug development process. Deuteration has gained attention because of its potential to affect the pharmacokinetic and metabolic profiles of drugs[1]. To evaluate the cytotoxicity of Pilocarpine, the morphology and viability of human corneal stromal (HCS) cells are examined by light microscopy and MTT assay, respectively. Morphological observations show that HCS cells exposed to Pilocarpine at a concentration from 0.625 to 20 g/L exhibit dose- and time-dependent proliferation retardation and morphological abnormality such as cellular shrinkage, cytoplasmic vacuolation, detachment from culture matrix, and eventually death, while no obvious difference is observed between those exposed to Pilocarpine below the concentration of 0.625 g/L and controls. Results of MTT assay reveal that the cell viability of HCS cells decrease with time and concentration after exposing to Pilocarpine above the concentration of 0.625 g/L ($P<0.01$ or 0.05), while that of HCS cells treated with Pilocarpine below the concentration of 0.625 g/L show no significant difference to controls[3]. The partial muscarinic agonist, Pilocarpine, evokes concentration-dependent relaxation with an EC_{50} of 2.4 mM in isolated segments of rat tail artery that were constricted with Penylephrine (10 to 200 nM)[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	The Pilocarpine-induced saliva secretion of the control rats (CN) and exercised (EX) rats is examined. A significantly greater amount of saliva is induced by Pilocarpine in the EX rats than in the CN rats ($P<0.01$). Conversely, the Na^+ concentration in the saliva of the EX rats is significantly lower than that of the CN rats ($P<0.05$)[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

REFERENCES

[1]. Tonta MA, et al. Pilocarpine-induced relaxation of rat tail artery by a non-cholinergic mechanism and in the absence of an intact endothelium. Br J Pharmacol. 1994 Jun;112(2):525-32.

[2]. Matsuzaki K, et al. Daily voluntary exercise enhances pilocarpine-induced saliva secretion and aquaporin 1 expression in rat submandibular glands. FEBS Open Bio. 2017 Dec 7;8(1):85-93.

[3]. Wang RF, et al. Post-treatment with the GLP-1 analogue liraglutide alleviate chronic inflammation and mitochondrial stress induced by Status epilepticus. Epilepsy Res. 2018 Mar 9;142:45-52.

[4]. Yuan XL, et al. Cytotoxicity of pilocarpine to human corneal stromal cells and its underlying cytotoxic mechanisms. Int J Ophthalmol. 2016 Apr 18;9(4):505-11.

[5]. Russak EM, et al. Impact of Deuterium Substitution on the Pharmacokinetics of Pharmaceuticals. Ann Pharmacother. 2019 Feb;53(2):211-216.

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