Ipratropium bromide hydrate

Cat. No.: HY-B1332

CAS No.: 66985-17-9

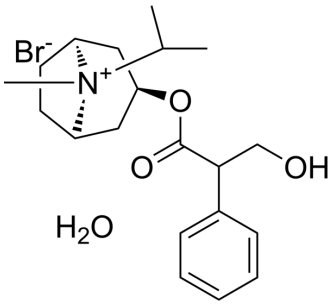
Molecular Formula: $C_{20}H_{32}BrNO_4$

Molecular Weight: 430.38

Target: mAChR

Pathway: GPCR/G Protein; Neuronal Signaling

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

H_2O : 50 mg/mL (116.18 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.3235 mL	11.6176 mL	23.2353 mL
	5 mM	0.4647 mL	2.3235 mL	4.6471 mL
	10 mM	0.2324 mL	1.1618 mL	2.3235 mL

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

In Vivo

1. Add each solvent one by one: PBS
Solubility: 50 mg/mL (116.18 mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

Ipratropium bromide (Sch 1000) hydrate is a muscarinic receptor antagonist, with IC_{50}s of 2.9 nM, 2 nM, and 1.7 nM for M1, M2, and M3 receptors, respectively. Ipratropium bromide hydrate relaxes smooth muscle, can be used in the research for COPD (chronic obstructive pulmonary disease) and asthma[1][2][3][4][5].

IC_{50} & Target

mAChR1	mAChR2	mAChR3
2.9 nM (IC_{50})	2 nM (IC_{50})	1.7 nM (IC_{50})

In Vitro

Ipratropium bromide hydrate (1 nM, 10 nM, 100 nM; 15 min) exerts its toxic effects via disruption of mitochondrial membrane potential[1].

Ipratropium bromide hydrate (1 nM-1 μM; 4 h) increases infarct size in isolated perfused heart ischaemia/reperfusion experiments with a dose-responsive manner (EC_{50}=22.7 nM)[1].

Ipratropium bromide hydrate (0.001 nM-0.1 mM; 2 h) inhibits adult rat cardiac myocyte growth after 4 h hypoxia treatment[1].

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

Cell Viability Assay[1]

Cell Line:	Adult Rat Cardiac Myocyte
Concentration:	0.001 nM-0.1 mM
Incubation Time:	2 h in dark; prior to 4 h hypoxia
Result:	Resulted cell viability in a dose-dependent manner, with the inhibition rate of 52.7% at 0.1 mM dose.

In Vivo

Ipratropium bromide hydrate (1.0 μg/kg; i.v.; single dose) enhances vagal nerve stimulation induing bronchoconstriction[2]. Ipratropium bromide hydrate (0.04 mg/20 mL and 0.20 mg/20 mL; inhalation for 30 min, rate=30 mL/30 min) can protect the lungs against the cadmium-induced acute neutrophilic inflammation by reducing the parenchyma inflammatory infiltration of neutrophils[4].

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

Animal Model:	Guinea-pigs of the Dunkin Hartley strain[2]
Dosage:	0.1-1 μg/kg
Administration:	Intravenous injection; single dose
Result:	Resulted little blocking effect on post-junctional muscarinic receptors at 0.3 μg/kg, and inhibited ACh-induced bronchoconstriction at 0.5 μg/kg.

Animal Model:	Male Sprague-Dawley rats (300-350 g)[4]
Dosage:	0.04 mg/20 mL and 0.20 mg/20 mL
Administration:	Inhalation; atomization rate of 30 mL/30 min; 30 min
Result:	Had no significant effects on any parameters recorded in healthy rats but exerted a protective effect against the inflammatory reaction elicited by cadmium.

REFERENCES

[1]. Fryer AD, et al. Maclagan, Ipratropium bromide potentiates bronchoconstriction induced by vagal nerve stimulation in the guinea-pig. Eur J Pharmacol, 1987. 139(2): p. 187-91.

[2]. Harvey, et al. Maddock, Ipratropium Bromide-Mediated Myocardial Injury in In Vitro Models of Myocardial Ischaemia/Reperfusion. Toxicol Sci, 2014.

[3]. Maria Prat, et al. Discovery of novel quaternary ammonium derivatives of (3R)-quinuclidinyl amides as potent and long acting muscarinic antagonists. Bioorg Med Chem Lett. 2015 Apr 15;25(8):1736-1741.

[4]. Wenhui Zhang, et al. Anti-inflammatory effects of formoterol and ipratropium bromide against acute cadmium-induced pulmonary inflammation in rats. Eur J Pharmacol. 2010 Feb 25;628(1-3):171-8.

[5]. Venkatasamy R, et al. Novel relaxant effects of RPL554 on guinea pig tracheal smooth muscle contractility. Br J Pharmacol. 2016 Aug;173(15):2335-51.

Caution: Product has not been fully validated for medical applications. For research use only.

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