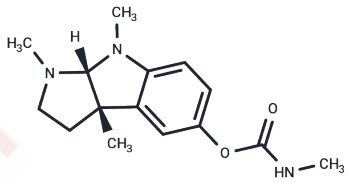
Data Sheet (Cat.No.T21438)

TargetMol

Physostigmine

Chemical Properties



CAS No. : 57-47-6

Formula: C15H21N3O2

Molecular Weight: 275.35

Storage: 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	Physostigmine is an alkaloid extracted from the poison bean (Physostigma venenosum) and acts as a reversible acetylcholinesterase (AChE) inhibitor. Physostigmine inhibits the action of acetylcholinesterase, increasing acetylcholine levels, and thus serves as an antidote for anticholinergic poisoning. Physostigmine crosses the blood-brain barrier and stimulates central cholinergic neurotransmission. Physostigmine can reverse memory deficits in transgenic mice with Alzheimer's disease.
Targets(IC50)	Others,Cholinesterase (ChE)
In vitro	Methods: Tissue homogenates were prepared from the CA3-CA1 region of the hippocampus. After perfusion with 10 μM Physostigmine for 20 minutes, acetylcholinesterase (AChE) activity was measured using a colorimetric assay immediately after perfusion, 20 minutes after elution, and 1 hour after elution. Results: AChE activity increased after 20 min of Physostigmine perfusion, returned to baseline after 20 min of elution, and showed a compensatory increase after 1 h of elution. [1] Methods: Primary rat cortical neurons were treated with Physostigmine (0.01, 0.1, 1.0, 10, 100 nM) for 24 h. Live-cell imaging (1 frame every 2 seconds for a total of 3 minutes) was performed to generate a kymograph, which was analyzed using KymoAnalyzer. Results: None of the Physostigmine concentrations had a significant effect on axonal transport velocity (anterior direction); conversely, the highest concentration (100 nM) significantly increased retrograde transport velocity.[2]
In vivo	Methods: To investigate the effects of Physostigmine, adult male C57BL/6J mice were administered Physostigmine (0.25 mg/kg) via intraperitoneal injection. Twenty minutes after the initial injection, ketamine (5 mg/kg) was administered intraperitoneally. The forced swim test was conducted 50 minutes later, and the immobility time within the first 4 minutes was recorded. Results: Physostigmine significantly increased the immobility time; ketamine significantly reduced the increase in immobility time induced by Physostigmine, indicating that Physostigmine impairs neurotransmission. [1]

Solubility Information

Solubility	DMSO: 40 mg/mL (145.27 mM),Sonication is recommended. H2O: Insoluble, (< 1 mg/ml refers to the product slightly soluble or insoluble)

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	3.6317 mL	18.1587 mL	36.3174 mL
5 mM	0.7263 mL	3.6317 mL	7.2635 mL
10 mM	0.3632 mL	1.8159 mL	3.6317 mL
50 mM	0.0726 mL	0.3632 mL	0.7263 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

Kim JW, et al. Distinct synaptic mechanisms drive the behavioral response to acute stress and rapid correction by ketamine. Neuropsychopharmacology. 2024;49(12):1916-1924.
Naughton SX, et al. The Carbamate, Physostigmine does not Impair Axonal Transport in Rat Cortical Neurons. Neurosci Insights. 2021;16:26331055211020289. Published 2021 May 24.
Allen L, Alsalim W. Best evidence topic report. Gammahydroxybutyrate overdose and physostigmine. Emerg Med J. 2006 Apr;23(4):300-1. Review. PubMed PMID: 16549578; PubMed Central PMCID: PMC2579509.
Traub SJ, Nelson LS, Hoffman RS. Physostigmine as a treatment for gamma-hydroxybutyrate toxicity: a review. J Toxicol Clin Toxicol. 2002;40(6):781-7. Review. PubMed PMID: 12475191.

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