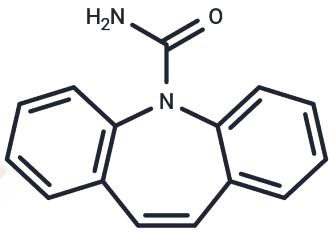
Data Sheet (Cat.No.T0943)

TargetMol

Carbamazepine

Chemical Properties



CAS No. : 298-46-4

Formula: C15H12N2O

Molecular Weight: 236.27

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	Carbamazepine (NSC-169864) is a tricyclic compound chemically related to tricyclic antidepressants (TCA) with anticonvulsant and analgesic properties. Carbamazepine exerts its anticonvulsant activity by reducing polysynaptic responses and blocking post-tetanic potentiation. Its analgesic activity is not understood; however, carbamazepine is commonly used to treat pain associated with trigeminal neuralgia.
Targets(IC50)	Mitophagy,Calcium Channel,HDAC,Autophagy,Potassium Channel,Sodium Channel
In vitro	In the presence of batrachotoxin, carbamazepine did not alter the binding of scorpion toxin (125I-labeled) to synaptosomes; however, upon the addition of 1.25 μM batrachotoxin, carbamazepine concentration dependently inhibited the enhancement of batrachotoxin-dependent scorpion toxin binding (IC50: 260 μM) via regulatory sites of the toxin alkaloid. Importantly, carbamazepine had no effect on [3H]saxitoxin binding. When acting on rat brain synaptosomes, carbamazepine impeded the binding of [3H] Batrachotoxinin A 20-α-benzoate to the voltage-sensitive sodium channel site (IC50: 131 μM), thereby reducing the ion flow activity of the sodium channels. As the dissociation rate of the ligand from the receptor-ligand complex increased, carbamazepine, despite decreasing receptor affinity, did not change the maximal binding capacity in Scatchard analyses of [3H]Batrachotoxinin A 20-α-benzoate to synaptosomes, suggesting that binding of [3H]Batrachotoxinin A 20-α-benzoate inhibits conformational changes associated with anticonvulsant effects.
In vivo	Treatment with Carbamazepine (25 mg/kg) significantly increases the levels of hippocampal dopamine, dihydroxyphenylalanine (DOPA), striatal homovanillic acid, and 3,4-dihydroxyphenylacetic acid, with these effects being dose-dependent. However, a higher dose of Carbamazepine (50 mg/kg) markedly reduces the overall hippocampal homovanillic acid and striatal DOPA and dopamine levels, while not affecting hippocampal dopamine, DOPA, and DOPAC levels, nor overall striatal DOPAC and homovanillic acid. At a dose of Carbamazepine (100 mg/kg, i.p.), there is a dose-dependent significant increase in the concentrations of neuroactive steroids in rat plasma corticosterone.

Solubility Information

Solubility	DMSO: 62 mg/mL (262.41 mM),Sonication is recommended. Ethanol: 15 mg/mL (63.49 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 2 mg/mL (8.46 mM),Sonication is recommended. *Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	4.2324 mL	21.1622 mL	42.3245 mL
5 mM	0.8465 mL	4.2324 mL	8.4649 mL
10 mM	0.4232 mL	2.1162 mL	4.2324 mL
50 mM	0.0846 mL	0.4232 mL	0.8465 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

Willow M, et al. Mol Pharmacol, 1982, 22(3), 627-635.
Li H, Zhou D S, Chang H, et al. Interactome Analyses implicated CAMK2A in the genetic predisposition and pharmacological mechanism of Bipolar Disorder. Journal of Psychiatric Research. 2019
Okada M, et al. Epilepsy Res, 1997, 28(2), 143-153.
Serra M, et al. Neuropharmacology, 2000, 39(12), 2448-2456.
Li H, Zhou D S, Chang H, et al. Interactome Analyses implicated CAMK2A in the genetic predisposition and pharmacological mechanism of Bipolar Disorder[J]. Journal of psychiatric research. 2019.
. Carbamazepine promotes specific stimuli induced NLRP3 inflammasome activation and causes idiosyncratic liver injury in mice . Archives of Toxicology. 2019