Carbamazepine

Cat. No.: HY-B0246

CAS No.: 298-46-4

Molecular Formula: $C_{15}H_{12}N_2O$

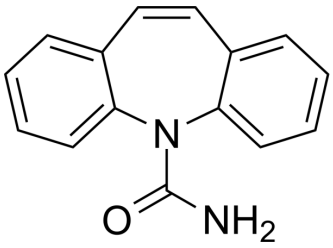
Molecular Weight: 236.27

Target: Sodium Channel; Autophagy; Mitophagy; Potassium Channel; Calcium Channel; HDAC

Pathway: Membrane Transporter/Ion Channel; Autophagy; Neuronal Signaling; Cell Cycle/DNA Damage; Epigenetics

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (423.24 mM; Need ultrasonic)

H_2O : < 0.1 mg/mL (ultrasonic) (insoluble)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
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

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

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (10.58 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (10.58 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (10.58 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Carbamazepine is an orally active pressure-sensitive sodium ion channel blocker with an IC_{50} of 131 μM. Carbamazepine blocks voltage gated Na^+, Ca^{2+}, and K^+ channels, and is also a HDAC inhibitor (IC_{50}: 2 μM). Carbamazepine is an anticonvulsant and can be used for research of epilepsy and neuropathic pain[1][2][3].

In Vitro

Carbamazepine (0-500 μM, 10 days) inhibits pre-adipocyte differentiation (10 days) and triglyceride accumulation (7 days) in 3T3-L1, 3T3-F442A and T37i cells[4].
Carbamazepine (5-20 μM, 15 min before LPS) inhibits LPS-induced production of NO and iNOS protein, and phosphorylation of Akt in microglial (BV-2) cells[5].
Carbamazepine (20 μM, 15 min before LPS) inhibits LPS-induced COX-2 expression and TNF-α production in microglial (BV-2) cells[5].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Western Blot Analysis[4]

Cell Line:	3T3-L1 pre-adipocytes
Concentration:	0-500 μM
Incubation Time:	10 days
Result:	Decreased PPAR-γ and C/EPB-α protein levels. Increased ERK 1/2 phosphorylation after a 10 min exposure, and also increased p38 MAPK phosphorylation.

In Vivo

Carbamazepine (250 mg/kg, p.o.) promotes liver regeneration and survival in partial hepatectomy (PHx) treated mice[6].
Carbamazepine (0.25%-0.75% for ICR mice, 0.5% and 0.75% for C57bl/6 mice with, in food (w/w)) shows mood-stabilising effects in mice[7].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	70% Partial hepatectomy treated mice[6]
Dosage:	250 mg/kg
Administration:	p.o.
Result:	Recoverd liver to body weight ratio. Increased the number of BrdU-positive nuclei, Increased PCNA protein. Increased mRNA levels of ccne2 and ccna2.

CUSTOMER VALIDATION

- Nat Commun. 2023 Jun 3;14(1):3224.
- Autophagy. 2022 Jul 1;1-14.
- Theranostics. 2019 Aug 14;9(21):6334-6353.
- Chemosphere. 2019 Jun;225:378-387.
- Biomed Pharmacother. 2022 Nov 22;157:114037.

See more customer validations on www.MedChemExpress.com

REFERENCES

[1]. Beutler AS, et al. Carbamazepine is an inhibitor of histone deacetylases. Life Sci. 2005 May 13;76(26):3107-15.

[2]. Turpin E, et al. Carbamazepine directly inhibits adipocyte differentiation through activation of the ERK 1/2 pathway. Br J Pharmacol. 2013 Jan;168(1):139-50.

[3]. Wang CH, et al. Carbamazepine attenuates inducible nitric oxide synthase expression through Akt inhibition in activated microglial cells. Pharm Biol. 2014

Nov;52(11):1451-9.

[4]. Kawaguchi T, et al. Carbamazepine promotes liver regeneration and survival in mice. J Hepatol. 2013 Dec;59(6):1239-45.

[5]. Kara NZ, et al. Chronic oral carbamazepine treatment elicits mood-stabilising effects in mice. Acta Neuropsychiatr. 2014 Feb;26(1):29-34.

[6]. Willow, M. and W.A. Catterall, Inhibition of binding of [3H]batrachotoxinin A 20-alpha-benzoate to sodium channels by the anticonvulsant drugs diphenylhydantoin and carbamazepine. Mol Pharmacol, 1982. 22(3): p. 627-35.

[7]. Okada, M., et al., Biphasic effects of carbamazepine on the dopaminergic system in rat striatum and hippocampus. Epilepsy Res, 1997. 28(2): p. 143-53.

Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA