Bupivacaine

Cat. No.: HY-B0405

CAS No.: 38396-39-3

Molecular Formula: $C_{18}H_{28}N_2O$

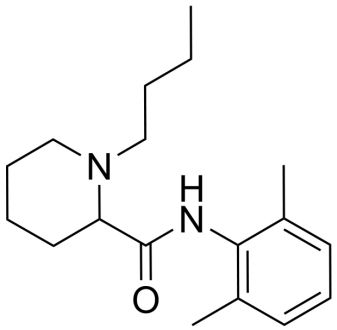
Molecular Weight: 288.43

Target: iGluR; Sodium Channel; Calcium Channel; Potassium Channel

Pathway: Membrane Transporter/Ion Channel; Neuronal Signaling

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 (346.70 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	3.4670 mL	17.3352 mL	34.6705 mL
5 mM	0.6934 mL	3.4670 mL	6.9341 mL
10 mM	0.3467 mL	1.7335 mL	3.4670 mL

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

BIOLOGICAL ACTIVITY

Description

Bupivacaine is a NMDA receptor inhibitor. Bupivacaine can block sodium, L-calcium, and potassium channels.Bupivacaine potently blocks SCN5A channels with the IC_{50} of 69.5 μM. Bupivacaine can be used for the research of chronic pain[1][2][3].

IC_{50} & Target

NMDA Receptor

In Vitro

Bupivacaine inhibits NMDA receptor-mediated synaptic transmission in the dorsal horn of the spinal cord, an area critically involved in central sensitization[1].

Bupivacaine influences the voltage dependency of channel activation and steady-state inactivation by shifting the membrane potential of half-maximal activation/inactivation toward somewhat more negative membrane potentials. In their inactivated state, SCN5A channels are slightly sensitive toward Bupivacaine IC_{50}=2.18±0.16 μM[2].

Bupivacaine reversibly inhibits the SK2 channel in a dose-dependent manner with the IC_{50} of 16.5 μM[3].

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

Cell Viability Assay[3]

Cell Line:	HEK 293 cells transfected with the SK2 gene (transfected cells were named SK2 cells)
Concentration:	10, 100, 1000 μM
Incubation Time:	
Result:	The IC_{50} value was 16.5 μM.

CUSTOMER VALIDATION

- Nat Commun. 2023 Jun 3;14(1):3224.
- Stem Cell Res Ther. 2021 Feb 4;12(1):107.
- Sci Rep. 2022 Jan 26;12(1):1378.

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REFERENCES

[1]. Meaghan A Paganelli, et al. Actions of Bupivacaine, a widely used local anesthetic, on NMDA receptor responses. J Neurosci. 2015 Jan 14;35(2):831-42.

[2]. Alexander P Schwoerer, et al. A Comparative Analysis of Bupivacaine and Ropivacaine Effects on Human Cardiac SCN5A Channels. Anesth Analg. 2015 Jun;120(6):1226-34.

[3]. Carsten Stoetzer, et al. Inhibition of Voltage-Gated Na^+ Channels by Bupivacaine Is Enhanced by the Adjuvants Buprenorphine, Ketamine, and Clonidine. Reg Anesth Pain Med.Jul/Aug 2017;42(4):462-468.

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