# Bupivacaine

**Cat. No.:** HY-B0405

**CAS No.:** 38396-39-3

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

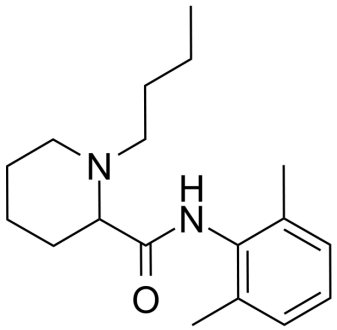
**Molecular Weight:** 288.43

**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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