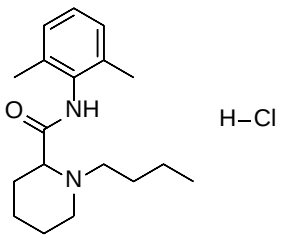
Product data sheet

MedKoo Cat#: 317356 Name: Bupivacaine HCl CAS#: 18010-40-7 (HCl) Chemical Formula: $C_{18}H_{29}ClN_2O$ Exact Mass: 288.2202 Molecular Weight: 324.89	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:
Bupivacaine is a BK/SK, Kv1, Kv3, TASK-2 K Channel and voltage-gated Na channel blocker used as an anesthetic. It maybe neurotoxic at high does, inducing apoptosis in neuroblastoma cells. It acts by binding to the intracellular portion of voltage-gated sodium channels and blocking sodium influx into nerve cells.

2. CoA, QC data, SDS, and handling instruction
SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	40.11	123.46
DMF	30.0	92.34
Water	38.75	119.27
Ethanol	47.50	146.20
Ethanol:PBS (pH 7.2) (1:1)	0.50	1.54

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	3.08 mL	15.39 mL	30.78 mL
5 mM	0.62 mL	3.08 mL	6.16 mL
10 mM	0.31 mL	1.54 mL	3.08 mL
50 mM	0.06 mL	0.31 mL	0.62 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator
Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study
In vitro study

1. Chapman GL, Zuckerman LM, Mirshahidi S. The In Vitro Effects of Bupivacaine on Cartilage-forming Tumor Cells. J Am Acad Orthop Surg. 2019 Apr 1;27(7):e337-e345. doi: 10.5435/JAAOS-D-17-00407. PMID: 30278011.
2. Flenner F, Arlt N, Nasib M, Schobesberger S, Koch T, Ravens U, Friedrich F, Nikolaev V, Christ T, Stehr SN. In Vitro Negative Inotropic Effect of Low Concentrations of Bupivacaine Relates to Diminished Ca2+ Sensitivity but Not to Ca2+ Handling or β-Adrenoceptor Signaling. Anesthesiology. 2018 Jun;128(6):1175-1186. doi: 10.1097/ALN.0000000000002180. PMID: 29547406.

In vivo study

1. Wang T, Hurwitz O, Shimada SG, Tian D, Dai F, Zhou J, Ma C, LaMotte RH. Anti-nociceptive effects of bupivacaine-encapsulated PLGA nanoparticles applied to the compressed dorsal root ganglion in mice. Neurosci Lett. 2018 Mar 6;668:154-158. doi: 10.1016/j.neulet.2018.01.031. Epub 2018 Feb 3. PMID: 29355697; PMCID: PMC5829013.

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2. Zhang X, Xia L, Xie A, Liao O, Ju F, Zhou Y. Low concentration of Bupivacaine ameliorates painful diabetic neuropathy by mediating miR-23a/PDE4B axis in microglia. Eur J Pharmacol. 2021 Jan 15;891:173719. doi: 10.1016/j.ejphar.2020.173719. Epub 2020 Nov 1. PMID: 33144067.

7. Bioactivity

Biological target: Bupivacaine hydrochloride is a Na+ channel blocker which has local narcotic effect.

In vitro activity

The in vitro effects of bupivacaine on cartilaginous tumor cells were evaluated. Multiple different cartilaginous tumors were evaluated, including enchondromas, chondroblastomas, a low-grade chondrosarcoma, which were harvested from patients during tumor resection, and a grade-II chondrosarcoma SW1535 (ATCC HTB-94). The tumor cells were treated with 0.25% and 0.5% bupivacaine at various times points, and the result was compared with that of untreated tumor cells. Increasing periods of exposure to bupivacaine decreased the cell viability in all tumor samples. The cytotoxicity of 0.5% bupivacaine was significantly greater than that of 0.25% bupivacaine in all tumor cells tested.

Reference: J Am Acad Orthop Surg. 2019 Apr 1;27(7):e337-e345.
https://journals.lww.com/jaaos/Abstract/2019/04010/The_In_Vitro_Effects_of_Bupivacaine_on.10.aspx

In vivo activity

The role of Bupivacaine in painful diabetic neuropathy was evaluated. Mouse model with painful diabetic neuropathy was established, and then treated with different concentrations of Bupivacaine. Bupivacaine ameliorated the mechanical allodynia, thermal hyperalgesia, and thermal allodynia in mice with painful diabetic neuropathy, and is more effective at low concentration. Moreover, low concentration of Bupivacaine inhibited inflammation and promoted miR-23a expression in mice with painful diabetic neuropathy and in microglia induced by high glucose.

Reference: Eur J Pharmacol. 2021 Jan 15;891:173719.
https://www.sciencedirect.com/science/article/abs/pii/S0014299920308116?via%3Dihub