# QX-314 bromide

**Cat. No.:** HY-101350

**CAS No.:** 24003-58-5

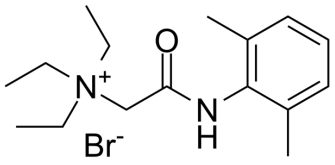
**Molecular Formula:** $C_{16}H_{27}BrN_2O$

**Molecular Weight:** 343.3

**Target:** Sodium Channel

**Pathway:** Membrane Transporter/Ion Channel

**Storage:** 4°C, sealed storage, away from moisture
* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



## SOLVENT & SOLUBILITY

**In Vitro**

$H_2O$ : 100 mg/mL (291.29 mM; Need ultrasonic)
DMSO : 50 mg/mL (145.65 mM; ultrasonic and warming and heat to 60°C)

**Preparing Stock Solutions**

| Solvent / Mass / Concentration | 1 mg | 5 mg | 10 mg |
|---|---|---|---|
| 1 mM | 2.9129 mL | 14.5645 mL | 29.1290 mL |
| 5 mM | 0.5826 mL | 2.9129 mL | 5.8258 mL |
| 10 mM | 0.2913 mL | 1.4565 mL | 2.9129 mL |

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

**In Vivo**

1. Add each solvent one by one: PBS
   Solubility: 50 mg/mL (145.65 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (6.06 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (6.06 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (6.06 mM); Clear solution

## BIOLOGICAL ACTIVITY

**Description**

QX-314 bromide is a membrane-impermeable permanently charged sodium channel blocker[1].

**$IC_{50}$ & Target**

sodium channel[1]

**In Vitro**

QX-314 bromide exerts biphasic effects on transient receptor potential vanilloid subtype 1 channels (TRPV1) in vitro [1].
QX-314 bromide (1–60 mM) directly activates TRPV1 in a concentration-dependent manner[1].

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| | QX-314 bromide (≥ 30 mM) produces oocyte membrane blackening and cell death [1].<br>QX-314 bromide inhibits calcium currents in hippocampal CA1 pyramidal neurons intracellular, and the low-threshold (T-type) $Ca^{2+}$ currents are on average < 10% of control amplitude [3].<br>QX-314 bromide shifts the current-voltage relationships (I-Vs) in the positive voltage direction due to the presence of intracellular Br- [3].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |
| **In Vivo** | QX-314 bromide (1.6 mg/kg; i.c.) abolishes responses to noxious mechanical and thermal stimuli without motor or tactile deficits when co-treatment with capsaicin[2].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

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| Animal Model: | Male Sprague-Dawley rats (250-290 g)[2] |
| Dosage: | 1.6 mg/kg |
| Administration: | Intracutaneous injection |
| Result: | Abolished responses to noxious mechanical and thermal stimuli without motor or tactile deficits when co-treatment with capsaicin. |

## REFERENCES


[1]. Rivera-Acevedo RE, et al. The quaternary lidocaine derivative, QX-314, exerts biphasic effects on transient receptor potential vanilloid subtype 1 channels in vitro. Anesthesiology. 2011 Jun;114(6):1425-34.

[2]. Binshtok AM, et al. Coapplication of lidocaine and the permanently charged sodium channel blocker QX-314 produces a long-lasting nociceptive blockade in rodents. Anesthesiology. 2009 Jul;111(1):127-37.

[3]. Talbot MJ, et al. Intracellular QX-314 inhibits calcium currents in hippocampal CA1 pyramidal neurons. J Neurophysiol. 1996 Sep;76(3):2120-4.





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