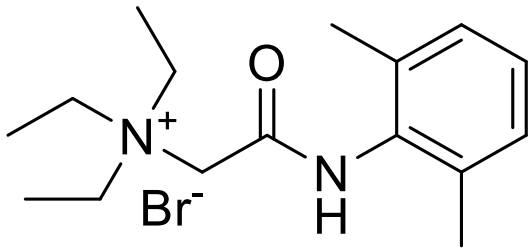
Product data sheet

MedKoo Cat#: 532485 Name: QX-314 Br CAS: 24003-58-5 Chemical Formula: $C_{16}H_{27}BrN_2O$ Molecular Weight: 343.31	
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:
QX-314 Br is a membrane impermeable quaternary derivative of lidocaine, a blocker of voltage-activated Na+ channels. QX 314 bromide also inhibits calcium currents in hippocampal CA1 pyramidal neurons.

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
Water	34.33	100

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	2.91 mL	14.56 mL	29.13 mL
5 mM	0.58 mL	2.91 mL	5.83 mL
10 mM	0.29 mL	1.46 mL	2.91 mL
50 mM	0.06 mL	0.29 mL	0.58 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. Rivera-Acevedo RE, Pless SA, Ahern CA, Schwarz SK. 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. doi: 10.1097/ALN.0b013e318216ea0c. Erratum in: Anesthesiology. 2015 Aug;123(2):492. PMID: 21502857.
2. Armogida M, Giustizieri M, Zona C, Piccirilli S, Nisticò R, Mercuri NB. N-ethyl lidocaine (QX-314) protects striatal neurons against ischemia: an in vitro electrophysiological study. Synapse. 2010 Feb;64(2):161-8. doi: 10.1002/syn.20735. PMID: 19852070.

In vivo study

1. Takahashi K, Hayakawa C, Onimaru H. Effects of a quaternary lidocaine derivative, QX-314, on the respiratory activity in brainstem-spinal cord preparation from newborn rats. Neurosci Lett. 2016 Apr 21;619:121-5. doi: 10.1016/j.neulet.2016.03.022. Epub 2016 Mar 15. PMID: 26992939.
2. Perkins KL, Wong RK. Intracellular QX-314 blocks the hyperpolarization-activated inward current Iq in hippocampal CA1 pyramidal cells. J Neurophysiol. 1995 Feb;73(2):911-5. doi: 10.1152/jn.1995.73.2.911. PMID: 7760149.

7. Bioactivity
Biological target:

QX 314 bromide is a sodium channel blocker.

Product data sheet

In vitro activity

QX-314, a quaternary lidocaine derivative, has been shown to interact with and permeate TRPV1 channels to produce nociceptive and sensory blockade in animals in vivo. This study found that QX-314 activated TRPV1 channels at 10, 30, and 60 mM but not TRPV4 channels. This study shows that QX-314 exerts biphasic effects on TRPV1 channels, inhibiting capsaicin-evoked TRPV1 currents at lower concentrations and activating TRPV1 channels at higher concentrations. These findings may provide an explanation for the irritant properties of intrathecal QX-314 in mice in vivo.

Reference: Anesthesiology. 2011 Jun;114(6):1425-34. https://pubmed.ncbi.nlm.nih.gov/21502857/

In vivo activity

The use of QX-314 has been proposed to achieve selective inhibition of nociceptors that express transient receptor potential vanilloid 1 (TRPV1) channels with fewer motor deficits. This study examined the effects of QX-314 on respiratory rhythm generation in brainstem-spinal cord preparations from newborn rats. The extracellular application of QX-314 decreased the C4 burst rate, amplitude, and slope during the initial rising phase. These findings could help explain one of the mechanisms underlying the central toxicities that occur after the systemic application of QX-314.

Reference: Neurosci Lett. 2016 Apr 21;619:121-5. https://pubmed.ncbi.nlm.nih.gov/26992939/

Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.