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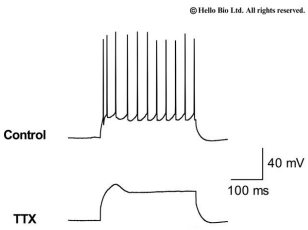
DATASHEET

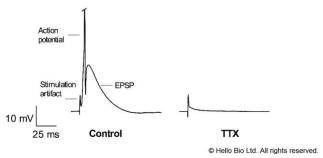
Tetrodotoxin (citrate free)

Product overview

Name	Tetrodotoxin (citrate free)
Cat No	HB1034
Alternative names	TTX
Biological action	Blocker
Purity	>99%
Special requirements	As this product is a toxin, customers are required to complete a short end user declaration when ordering. Our customer care team will be happy to help you with this.
Customer comments	This is a home office notifiable schedule 5 toxin. *Just washed the Tetrodotoxin (TTX) on and it works as expected (it inhibits the fibre volley at 1 µM).***Verified customer, The University of Bristol** *Tetrodotoxin (citrate free) is a wonderful product. Very efficient and very effective in blocking sodium channels.***Verified customer, Drexel University College of Medicine**
Description	Potent, selective, use-dependent Na^+ channel blocker. Citrate free.

Images





Biological Data

Biological description	Potent, selective and reversible, voltage dependent Na^+ channel blocker. Use dependent. Commonly used in electrophysiological preparations to block or reduce excitability. Water soluble, Tetrodotoxin citrate also available.
Application notes	Tetrodotoxin is commonly used in electrophysiology to block excitability by inhibiting action potential firing within neurons. It is commonly applied at concentrations of 1 µM. Tetrodotoxin from Hello Bio works as expected and blocks action potential firing (see Fig 1 and 2 above).

#Protocol 1: Effect of TTX citrate on action potentials in mouse cortical neurons

- Whole cell voltage clamp recordings were obtained from layer V pyramidal neurons of the mouse prelimbic cortex brain slice.
- Neurons were held at the resting membrane potential (~ -70 mV) and injected with a 500 pA 300 ms current step to induce action potential firing.
- TTX was bath applied for 10 min first at 100 nM then 300 nM, 1 µM and 2 µM. After

each drug application a current step was recorded to assess action potential blockade.

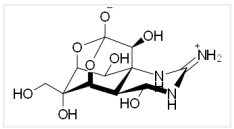
#Protocol 2: Effect of TTX citrate on EPSPs and action potential firing in mouse cortical neurons

- Whole cell voltage clamp recordings were obtained from layer V pyramidal neurons of the mouse prelimbic cortex brain slice.
- Neurons were held at the resting membrane potential (~ -70 mV) and EPSP were evoked by placing a stimulating electrode close to the recorded the neuron in layer II/III.
- EPSPs and action potentials were evoked by single square (150 µs) pulse every 10 sec with an intensity that produced both an EPSP and action potential.
- TTX was bath applied for 10 min first at 100 nM then 300 nM, 1 µM and 2 µM whist continually evoking and recording EPSP/A.Ps.

Solubility & Handling

Storage instructions	-20°C (desiccate)
Solubility overview	Soluble in acidic buffer (pH 4.8) to 3mM
Handling	This product is soluble to 3mM in an acidic buffer (pH 4.8), e.g. a 0.1M citrate or acetate buffer. Therefore, you can make a buffer solution by dissolving either sodium citrate or sodium acetate in water to a final concentration of 0.1M. You can then adjust the pH via the addition of citric acid, acetic acid or sodium hydroxide to pH 4.8.
Important	This product is for RESEARCH USE ONLY and is not intended for therapeutic or diagnostic use. Not for human or veterinary use

Chemical Data

Chemical name	Octahydro-12-(hydroxymethyl)-2-imin o-5,9:7,10a-dimethano-10a*H*-[1,3]dioxocino[6,5-*d*]py rimidine-4,7,10,11,12-pentol
Molecular Weight	319.27
Chemical structure	
Molecular Formula	$C_{11}H_{17}N_3O_8$
CAS Number	4368-28-9
PubChem identifier	4490623
SMILES	C(C1(C2C3C(N=C(NC34C(C1OC(C4O)(O2)O)O)N)O)O)O
Source	Extracted from fugu
InChi	InChI=1S/C11H17N3O8/c12-8-13-6(17)2-4-9(19,1-15)5-3(16)10(2,14-8)7(18)11(20,21-4)22-5/h2-7, 15-20H,1H2,(H3,12,13,14)
InChiKey	CFMYXEVWODSLAX-UHFFFAOYSA-N

References

The protective action of tetrodotoxin and (+/-)-kavain on anaerobic glycolysis, ATP content and intracellular Na+ and Ca2+ of anoxic brain vesicles.

Gleitz J *et al* (1996) Neuropharmacology 35(12)
PubMedID 9076753

Antagonistic effects of tetrodotoxin on aconitine-induced cardiac toxicity.

Ono T *et al* (2013) J Nippon Med Sch 80(5)
PubMedID 24189353

Tetrodotoxin: chemistry, toxicity, source, distribution and detection.

Bane V *et al* (2014) Toxins (Basel) 6(2)
PubMedID 24566728

Tetrodotoxin for moderate to severe cancer pain: a randomized, double blind, parallel design multicenter study.

Hagen NA *et al* (2008) J Pain Symptom Manage 35(4)

PubMedID 18243639