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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.

This is a home office notifiable schedule 5 toxin.

 $\mu$ M). Verified customer, The University of Bristol

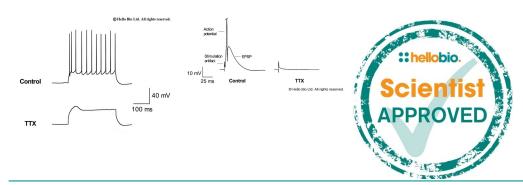
Tetrodotoxin (citrate free) is a wonderful product. Very efficient and very effective in blocking sodium

channels. Verified customer, Drexel University College of Medicine

Potent, selective, use-dependent Na+ channel blocker. Citrate free.

## **Images**

Description



## **Biological Data**

**Biological description** 

Potent, selective and reversible, voltage dependent Na<sup>+</sup> 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  $\mu$ M. 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

**Solubility overview** Soluble in acidic buffer (pH 4.8) to 3mM

Storage instructions -20 °C (desiccate)

Storage of solutions Prepare and use solutions on the same day if possible. Store solutions at -20 °C for up to one month if

storage is required. Equilibrate to RT and ensure the solution is precipitate free before use. 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.

**Shipping Conditions** Stable for ambient temperature shipping. Follow storage instructions on receipt.

This product is for RESEARCH USE ONLY and is not intended for therapeutic or diagnostic use. Not

for human or veterinary use

#### **Chemical Data**

Handling

**Important** 

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)

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