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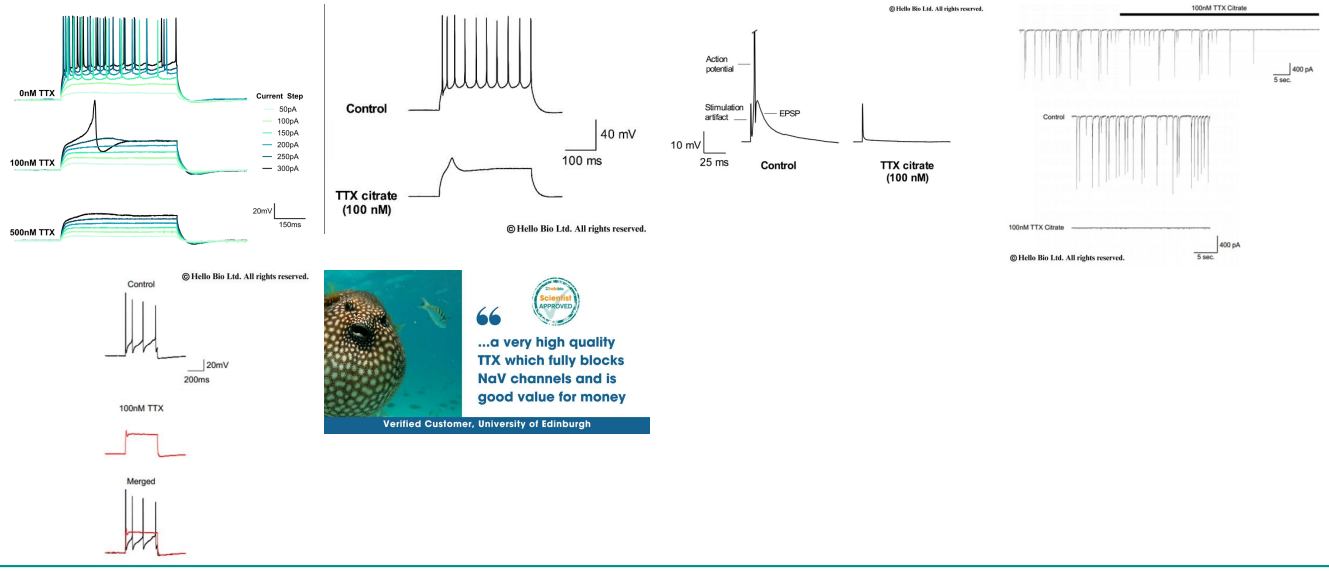
DATASHEET

Tetrodotoxin citrate

Product overview

Name	Tetrodotoxin citrate
Cat No	HB1035
Alternative names	TTX|TTX citrate
Biological action	Blocker
Purity	>99%
Special requirements	This is a Home Office notifiable schedule 5 toxin. 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	*Great product! TTX citrate works great and is very effective for neuroscience study. I have used this product for many years. Other products are excellent as well* **Verified customer, Texas A&M University, USA** *Works as it should for a reasonable price. The citrate version dissolves easily in water at 1mM and blocks action potentials quickly and reversibly at 0.5µM.* **Verified customer, Heidelberg University, Germany** *Excellent, good value product. We have bought this product for many years and it has always performed as it should. It dissolves quickly and is highly effective at the doses suggested by the literature. We will continue to buy it from Hello Bio.* **Verified customer, UCL, UK** *...worked perfectly as expected and blocked action potential firing at concentrations of 100 nM and above. I would recommend the use of Tetrodotoxin citrate from Hello Bio for use in electrophysiology recordings.* **Matt Udakis, University of Bath, UK**
Description	Potent, selective, use-dependent Na^+ channel blocker. Citrate Salt.

Images



Biological Data

Biological description	Potent, selective and reversible, voltage dependent Na^+ channel blocker. Use dependent. Citrate Salt. Commonly used in electrophysiological preparations to block or reduce excitability.
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 at concentrations of 100 nM and above (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.

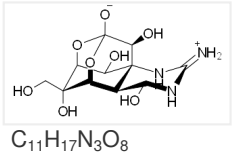
#Protocol 2: Effect of TTX citrate on EPSPs and action potential firing in mouse cortical neurons

- 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 water (1 mg/ml). The vial contains 1 mg of TTX and an additional 5 mg of citrate buffer to aid with solubility. For calculations relating to TTX concentration, refer to the molecular weight 319.27 listed on the vial.
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 citrate
Molecular Weight	319.27
Chemical structure	
Molecular Formula	$C_{11}H_{17}N_3O_8$
CAS Number	18660-81-6
PubChem identifier	54592378
SMILES	C(C(=O)O)C(CC(=O)O)(C(=O)O)O.C([C@@]1([C@@H]2[C@@H]3[C@H](N=C(N[C@]34[C@@H]([C@H]1O[C@]([C@H]4O)(O2)O)O)N)O)O)O
Source	Extracted from fugu
InChi	InChI=1S/C11H17N3O8.C6H8O7/c12-8-13-6(17)2-4-9(19,1-15)5-3(16)10(2,14-8)7(18)11(20,21-4)2 2-5;7-3(8)1-6(13,5(11)12)2-4(9)10/h2-7,15-20H,1H2,(H3,12,13,14);13H,1-2H2,(H,7,8)(H,9,10)(H,11, 12)/t2-,3-,4+,5-,6-,7+,9+,10+,11+;/m1./s1
InChiKey	YUJWMDOXROTQCW-WNGAXIQVSA-N
Appearance	White or colourless solid

References

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