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DATASHEET

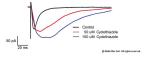
Cyclothiazide

Product overview

Name Cyclothiazide
Cat No HB0221
Alternative names CTZ
Biological action PAM
Purity >98%

Description AMPA receptor positive allosteric modulator. Inhibits AMPAR desensitization.

Images







Biological Data

Biological description

Cyclothiazide (CTZ) is an AMPA receptor positive allosteric modulator (PAM) which produces a fast inhibition of AMPAR desensitization and a slow potentiation of the AMPA current.

 $\label{eq:Cyclothiazide} \textbf{Cyclothiazide also inhibits GABA}_{\textbf{A}} \ \textbf{mediated currents and shows diuretic and convulsive actions}.$

Application notes

Cyclothiazide is active in vivo.

The AMPAR positive allosteric modulator Cyclothiazide increases the open time of the AMPAR by inhibiting AMPAR desensitization. It is often used at a concentration of 100 μ M. Cyclothiazide from Hello Bio potentiates AMPAR mediated evoked EPSCs in cortical neurons at 50 μ M and above (see Fig 1 above)

#Protocol 1: Evoked and spontaneous evoked excitatory post synaptic currents (EPSCs)

- Whole cell voltage clamp recordings were obtained from layer V neurons of the mouse prelimbic cortex brain slice.
- EPSCs were evoked via a stimulating electrode placed in layers II/III delivering a single square (150 μs) pulse every 10 sec at an intensity that gave a reliable EPSC.
- Neurons were held at -70 mV (the reversal potential of GABA currents).
- EPSCs were then continuously stimulated and recorded in response to 5 min applications of 50 μM and then 100 μM Cyclothiazide.

Solubility & Handling

Storage instructions Solubility overview

Important

Room temperature

Soluble in DMSO (100mM) or ethanol (25mM)

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 6-Chloro-3,4-dihydro-3-(5-norbornen-2-yl)-2*H*-1,2,4-benzothiazidiazine-7-sulfonamide-1,1-dioxide

Molecular Weight 389.87

Chemical structure

CI H N NH O O O O

SMILES C1C2CC(C1C=C2)C3NC4=CC(=C(C=C4S(=O)(=O)N3)S(=O)(=O)N)Cl

Source Synthetic

InChi InChi=1S/C14H16ClN3O4S2/c15-10-5-11-13(6-12(10)23(16,19)20)24(21,22)18-14(17-11)9-4-7-1-2-

8(9)3-7/h1-2,5-9,14,17-18H,3-4H2,(H2,16,19,20)

InChiKey BOCUKUHCLICSIY-UHFFFAOYSA-N

MDL number MFCD00210192 Appearance White solid

References

Effects of cyclothiazide on GluR1/AMPA receptors.

Fucile S et al (2006) Proc Natl Acad Sci U S A 103(8)

PubMedID 16473938

Downregulated GABA and BDNF-TrkB pathway in chronic cyclothiazide seizure model.

Kong S et al (2014) Neural Plast 2014

PubMedID 24757570

The norbornenyl moiety of cyclothiazide determines the preference for flip-flop variants of AMPA receptor subunits.

Kessler M *et al* (2000) Neurosci Lett 287(2) **PubMedID**10854736

Superactivation of AMPA receptors by auxiliary proteins.

Carbone and Plested (2016) Nat Commun 7 **PubMedID**26744192