Hello Bio, Inc.
304 Wall St., Princeton, NJ 08540 USA

T. 609-683-7500
F. 609-228-4994

customercare-usa@hellobio.com

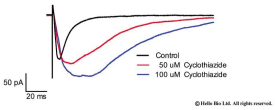
DATASHEET

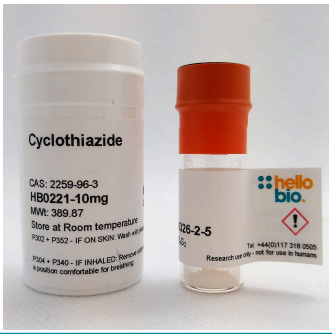
Cyclothiazide

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.

Cyclothiazide also inhibits $GABA_A$ 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 µM. Cyclothiazide from Hello Bio potentiates AMPAR mediated evoked EPSCs in cortical neurons at 50 µM and above (see Fig 1 above)

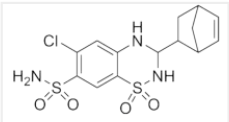
#Protocol 1: Evoked and spontaneous evoked excitatory post synaptic currents (EPSCs)

- 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	Room temperature
Solubility overview	Soluble in DMSO (100mM) or ethanol (25mM)
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	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	
Molecular Formula	$C_{14}H_{16}ClN_3O_4S_2$
CAS Number	2259-96-3
PubChem identifier	2910
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