Product overview

Name: Cyclothiazide
Cat No: HB0221
Short description: AMPA receptor positive allosteric modulator. Inhibits AMPAR desensitization.

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\textsubscript{A} mediated currents and shows diuretic and convulsive actions.

Alternative names: CTZ
Biological action: PAM
Purity: >98%

Images

Fig 1: Cyclothiazide enhancement of evoked EPSCs in mouse cortical neuron

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 HelloBio potentiates AMPAR mediated evoked EPSCs in cortical neurons at 50 μM and above. For assay protocol, see Protocol 1 in Application Notes below.
Properties

Chemical name: 6-Chloro-3,4-dihydro-3-(5-norbornen-2-yl)-2H-1,2,4-benzothiazidiazine-7-sulfonamide-1,1-dioxide
Molecular Weight: 389.87

Chemical structure:

![Chemical structure image]

Molecular Formula: C14H16ClN3O4S2
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

Applications

Application notes:
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.

Storing and Using Your Product

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.

References for Cyclothiazide
Effects of cyclothiazide on GluR1/AMPA receptors.
PubMedID: 16473938

Downregulated GABA and BDNF-TrkB pathway in chronic cyclothiazide seizure model.
PubMedID: 24757570

The norbornenyl moiety of cyclothiazide determines the preference for flip-flop variants of AMPA receptor subunits.
PubMedID: 10854736

Superactivation of AMPA receptors by auxiliary proteins.
PubMedID: 26744192