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# DATASHEET

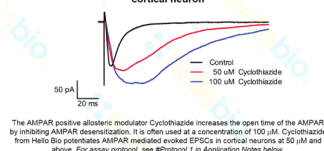
Cyclothiazide

## Product overview

<b>Name</b>	Cyclothiazide
<b>Cat No</b>	HB0221
<b>Description</b>	AMPA receptor positive allosteric modulator. Inhibits AMPAR desensitization.
<b>Alternative names</b>	CTZ
<b>Biological action</b>	PAM
<b>Purity</b>	>98%

## Images

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



## 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<sub>A</sub> 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  $\mu$ M. Cyclothiazide from Hello Bio potentiates AMPAR mediated evoked EPSCs in cortical neurons at 50  $\mu$ 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  $\mu$ s) 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  $\mu$ M and then 100  $\mu$ M 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.

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## Chemical Data

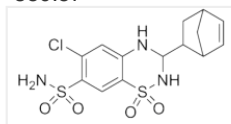
### Chemical name

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



### Molecular Formula

C<sub>14</sub>H<sub>16</sub>ClN<sub>3</sub>O<sub>4</sub>S<sub>2</sub>

### 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

BOCUKUHLCSYU-UHFFFAOYSA-N

### MDL number

MFCD00210192

### Appearance

White solid

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## 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](#)

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