Product overview

Name: Memantine hydrochloride
Cat No: HB0407
Short description: Non-competitive NMDA receptor antagonist

Biological description

Non-competitive NMDA receptor antagonist (IC$_{50}$ = 1.25 μM). Binds to ion channel site.

Shows low affinity but has rapid blocking and unblocking ability at the NMDAR.

Selectively blocks extrasynaptic NMDARs.

Enhances hippocampal long-term potentiation (LTP) and reverses LTP suppression.

Improves cognitive function and shows anti-Alzheimer's activity.

Alternative names: Axura, Akatinol, Namenda, Ebixa, Abixa, Memox
Biological action: Antagonist
Purity: >98%

Images

Fig 1: Memantine inhibition of evoked NMDAR mediated EPSCs in rat CA1 pyramidal neuron

The voltage-sensitive NMDA receptor antagonist memantine is effective at concentrations of 10-100 μM. In CA1 hippocampal neurons held at −60 mV, memantine from HelloBio at 100 μM gradually inhibited evoked NMDA receptor mediated excitatory currents over time. For assay protocol, see补充 file 1 in Application notes below.
Applications

The voltage sensitive NMDA receptor antagonist memantine is effective at concentrations of 10-100 µM. In CA1 hippocampal neurons held at – 30 Mv, Hello Bio memantine (at 100 µM) gradually inhibited evoked NMDA receptor mediated excitatory currents over time (see Fig 1 above).

Protocol 1: Assay evoked NMDAR currents at -30 mV (used for memantine)

- NMDAR currents were recorded via whole cell voltage clamp recordings of CA1 pyramidal neurons from the rat hippocampal brain slice and evoked via a stimulating electrode placed in the CA3 region to stimulate the Schaffer collateral pathway.
- Each NMDAR current was evoked via a single square (150 µs) pulse every 10 sec at a stimulus intensity that gave a reliable NMDAR current.
- Neurons were constantly held at -30 mV and NMDAR currents recorded in response to continual bath applications of NMDAR antagonists.
- All NMDAR recordings were made in the presence of GABAA-R and AMPA-R antagonists.

Storing and Using Your Product

Storage instructions Room temperature
Solubility overview Soluble in water (100mM)
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 Memantine hydrochloride

The N-methyl-D-aspartate receptor channel blockers memantine, MRZ 2/579 and other amino-alkyl-cyclohexanes antagonise 5-HT(3) receptor currents in cultured HEK-293 and N1E-115 cell systems in a non-competitive manner.

PubMedID: 11403963
Memantine is a clinically well tolerated N-methyl-D-aspartate (NMDA) receptor antagonist--a review of preclinical data.
PubMedID: 10465680

Memantine binding to a superficial site on NMDA receptors contributes to partial trapping.
PubMedID: 19687120

Memantine selectively blocks extrasynaptic NMDA receptors in rat substantia nigra dopamine neurons.
Wu and Johnson (2015) Brain Res. 1603 : 1-7
PubMedID: 25656790

Effects of memantine on hippocampal long-term potentiation, gamma activity, and sensorimotor gating in freely moving rats.
PubMedID: 26119223