

DATASHEET

Memantine hydrochloride

Product overview

Name	Memantine hydrochloride
Cat No	HB0407
Alternative names	Axura, Akatinol, Namenda, Ebixa, Abixa, Memox
Biological action	Antagonist
Purity	>98%
Description	Non-competitive NMDA receptor antagonist

Images



Biological Data

Biological description	Non-competitive NMDA receptor antagonist ($IC_{50} = 1.25 \mu M$). 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.
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Application notes	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).
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#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.

Biological description

Non-competitive NMDA receptor antagonist ($IC_{50} = 1.25 \mu M$). 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.

- All NMDAR recordings were made in the presence of GABA-A-R and AMPA-R antagonists.

Solubility & Handling

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.

Chemical Data

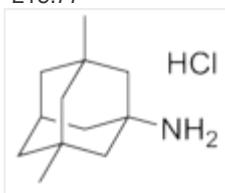
Chemical name

3,5-Dimethyl-tricyclo[3.3.1.13,7]decan-1-amine hydrochloride

Molecular Weight

215.77

Chemical structure



Molecular Formula

C₁₂H₂₁N.HCl

CAS Number

41100-52-1

PubChem identifier

181458

SMILES

Cl.CC13CC2(C)CC(N)(C1)CC(C2)C3

InChi

InChI=1S/C12H21N.CIH/c1-10-3-9-4-11(2,6-10)8-12(13,5-9)7-10;/h9H,3-8,13H2,1-2H3;1H

InChiKey

LDHMLJTFXJGPI-UHFFFAOYSA-N

MDL number

MFCD00214336

Appearance

White solid

References

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.

Rammes G *et al* (2001) Neurosci Lett 306(1-2)

PubMedID

[11403963](#)

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

Parsons CG *et al* (1999) Neuropharmacology 38(6)

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[10465680](#)

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

Kotermanski SE *et al* (2009) J Physiol 587(Pt 19)

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[19687120](#)

Memantine selectively blocks extrasynaptic NMDA receptors in rat substantia nigra dopamine neurons.

Wu and Johnson (2015) Brain Res. 1603

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[25656790](#)

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

Ma *et al* (2015) Neurobiol Aging 36(9)

