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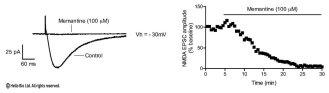
DATASHEET

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 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.

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).

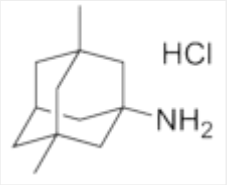
#Protocol 1: Assay evoked NMDAR currents at -30 mV (used for memantine)

- 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.

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	$C_{12}H_{21}N.HCl$
CAS Number	41100-52-1
PubChem identifier	181458
SMILES	Cl.CC13CC2(C)CC(N)(C1)CC(C2)C3
InChi	InChI=1S/C12H21N.ClH/c1-10-3-9-4-11(2,6-10)8-12(13,5-9)7-10;/h9H,3-8,13H2,1-2H3;1H
InChiKey	LDDHMLJTFXJGPI-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)
PubMedID 10465680

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

Kotermanski SE *et al* (2009) J Physiol 587(Pt 19)
PubMedID 19687120

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

Wu and Johnson (2015) Brain Res. 1603
PubMedID 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)
PubMedID 26119223