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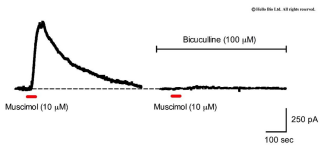
DATASHEET

Muscimol

Product overview

Name	Muscimol
Cat No	HB0887
Biological action	Agonist
Purity	>99%
Description	Potent, selective, competitive $GABA_A$ receptor agonist

Images



Biological Data

Biological description

Potent, selective and competitive $GABA_A$ receptor agonist and a potent partial $GABA_A$-ρ (GABAC) receptor agonist.

Muscimol is a GABA analog with comparable potency to GABA and is thought to act at the orthosteric site at $GABA_A$ receptors in varying active conformations.

Also acts as a weak inhibitor of GABA uptake but is not a substrate for GABA transaminase.

Application of muscimol evokes $GABA_A$R currents and its actions are antagonized by the $GABA_A$R antagonist bicuculline (bicuculline methochloride, methiodide and methobromide also available).

Muscimol enhances inhibitory neurotransmission and suppresses spontaneous activity. It is commonly used in reversible brain inactivation studies.

Active in vivo and blood brain barrier permeable.

Application notes

Shows psychoactive, memory impairing effects and anticonvulsant actions at high doses.
The $GABA_A$ receptor agonist muscimol is used at concentrations of 1-50 µM. Muscimol from Hello Bio used at 10 µM led to a large hyperpolarising whole-cell current in hippocampal CA1 neurons (see Fig 1 above). Action of muscimol was fully blocked by the $GABA_A$ receptor antagonist bicuculline (100 µM).

#Protocol 1: Assay used for muscimol

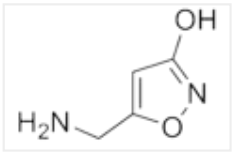
- Whole cell voltage clamp recordings of CA1 pyramidal neurons from the rat hippocampal brain slice.
- Neurons were held at 0 mV and $GABA_A$ receptor currents were evoked via applying muscimol

directly to the recording chamber during continuous perfusion.
- To test muscimol's selectivity to $GABA_A$ receptors the experiment was repeated within the same neuron in the presence of the $GABA_A$ receptor antagonist bicuculline (100 µM).
- Under these conditions muscimol failed to induce a hyperpolarising current.

Solubility & Handling

Solubility overview	Soluble in water (100mM)
Storage instructions	Room temperature
Storage of solutions	Prepare and use solutions on the same day if possible. Store solutions at -20°C for up to one month if storage is required. Equilibrate to RT and ensure the solution is precipitate free before use.
Shipping Conditions	Stable for ambient temperature shipping. Follow storage instructions on receipt.
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	5-Aminomethyl-3-hydroxyisoxazole
Molecular Weight	114.1
Chemical structure	
Molecular Formula	$C_4H_6N_2O_2$
CAS Number	2763-96-4
PubChem identifier	4266
SMILES	C1=C(ONC1=O)CN
Source	Synthetic
InChi	InChI=1S/C4H6N2O2/c5-2-3-1-4(7)6-8-3/h1H,2,5H2,(H,6,7)
InChiKey	ZJQHPWUVQPJPQT-UHFFFAOYSA-N
MDL number	MFCD00057894
Appearance	White solid

References

Anticonvulsant and behavioral effects of muscimol in immature rats.

Mareš P *et al* (2014) Brain Res 1582
PubMedID 25084038

Muscimol as an Ionotropic GABA Receptor Agonist.

Johnston GA (2014) Neurochem Res 39(10)
PubMedID 24473816

Hippocampal infusions of pyruvate reverse the memory-impairing effects of septal muscimol infusions.

Krebs DL *et al* (2005) Eur J Pharmacol 520(1-3)
PubMedID 16150437