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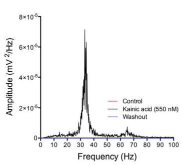
DATASHEET

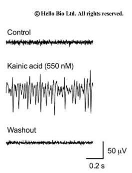
Kainic acid

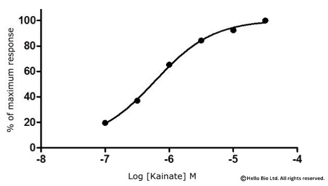
Product overview

Name	Kainic acid
Cat No	HB0355
Biological action	Agonist
Purity	>98%
Customer comments	*We tested the Kainic acid and we are very happy with it. Hello Bio Kainic acid was used at 25 mg/kg i.p. and successfully induced status epilepticus.* **Verified customer, CNRS, France** *Exactly as ordered - we ordered 50 mg kainic acid and it arrived swiftly. The batch display same EC50 and efficacy as all other batches, so we assume it is pure and an intact batch of the compound.* **Verified customer, University of Copenhagen** *Very happy - service from Hello Bio is always friendly and quick. Kainic acid (KA) works as expected on AMPA receptors in HEK cells. Much cheaper than alternative suppliers.* **Verified customer, UCL**
Description	Prototypic, selective kainate receptor agonist. Potent excitant and neurotoxin.

Images







Biological Data

Biological description	Kainic acid is the prototypic, selective kainate receptor (KAR) agonist. Analog of L-Glutamate. Kainic acid is a potent excitant and neurotoxin (shows ~30-fold more neurotoxic potency than L-Glutamate). It induces various changes *in vivo* including recurrent seizures, behavioural changes, oxidative stress, glial activation and selective neuronal death. Kainic acid exerts its neuroexcitatory action by binding to glutamate receptors to cause Ca^{2+} influx and triggering subsequent excitotoxic neuronal death pathway cascades. It is widely used to model various neurodegenerative diseases and epilepsy.
Application notes	The kainate receptor (KAR) agonist kainic acid induces neuronal oscillations in the gamma frequency band (35-100Hz). KAR activation leads to synchronous activity of excitatory and inhibitory network firing. Kainic acid is commonly used at concentrations of 400-600 nM to induce oscillations in acute brain slices. At a concentration of 550 nM, kainic acid from Hello Bio induces a strong gamma frequency neuronal oscillation (approx. 35Hz) within the CA3 region of the rat hippocampus (see Fig 1 above). Oscillations were abolished following kainic acid washout.

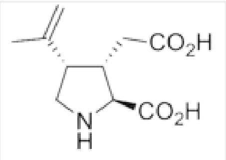
#Protocol 1: Oscillations assay

- Acute rat hippocampal slices were placed in an interface chamber and held at 30°C with a glass recording electrode placed in the CA3 region of the hippocampus.
- Control basal activity was recorded for 1 hr in the presence of aCSF before continuous perfusion of aCSF containing kainic acid at 550nM to induce oscillations.
- Oscillation activity was recorded once oscillations had stabilised (~2-3 hours).
- Kainic acid was then washed out and replaced with control aCSF.
- Data were analysed to create a power spectrum of the oscillation.

Solubility & Handling

Storage instructions	Room temperature
Solubility overview	Soluble in water (25mM, gentle warming)
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	(2*S*,3*S*,4*S*)-Carboxy-4-(1-methylethenyl)-3-pyrrolidineacetic acid
Molecular Weight	213.23
Chemical structure	
Molecular Formula	$C_{10}H_{15}NO_4$
CAS Number	487-79-6
PubChem identifier	10255
SMILES	CC(=C)[C@H]1CNC([C@H]1CC(=O)O)C(=O)O
Source	Extracted from diginea simplex
InChi	InChI=1S/C10H15NO4/c1-5(2)7-4-11-9(10(14)15)6(7)3-8(12)13/h6-7,9,11H,1,3-4H2,2H3,(H,12,13)(H,14,15)/t6-,7+,9-/m0/s1
InChiKey	VLSMHEGGTFMBBZ-OOZYFLPDSA-N
MDL number	MFCD00150833
Appearance	White solid

References

Kainic acid-mediated excitotoxicity as a model for neurodegeneration.

Wang Q *et al* (2005) Mol Neurobiol 31(1-3)
PubMedID 15953808

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Fezza F *et al* (2014) Mol Cell Neurosci 62
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Identification and characterization of the ligand binding subunit of a kainic acid receptor using monoclonal antibodies and peptide mapping.

Hampson DR *et al* (1989) J Biol Chem 264(22)
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Pharmacological characterization of glutamatergic agonists and antagonists at recombinant human homomeric and heteromeric kainate receptors in vitro.

Alt et al (2004) Neuropharmacology 46(6)

PubMedID 15033339