NMDA

Cat. No.: HY-17551

CAS No.: 6384-92-5

Molecular Formula: $C_5H_9NO_4$

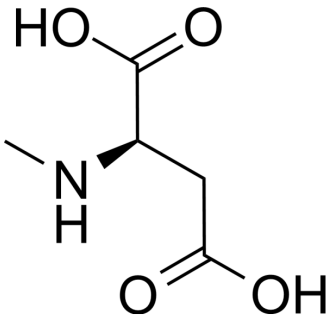
Molecular Weight: 147.13

Target: iGluR; Endogenous Metabolite

Pathway: Membrane Transporter/Ion Channel; Neuronal Signaling; Metabolic Enzyme/Protease

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	2 years
	-20°C	1 year



SOLVENT & SOLUBILITY

In Vitro

H_2O : 33.33 mg/mL (226.53 mM; Need ultrasonic)
DMSO : 10 mg/mL (67.97 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	6.7967 mL	33.9836 mL	67.9671 mL
5 mM	1.3593 mL	6.7967 mL	13.5934 mL
10 mM	0.6797 mL	3.3984 mL	6.7967 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 36.67 mg/mL (249.24 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 1 mg/mL (6.80 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 1 mg/mL (6.80 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 1 mg/mL (6.80 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

NMDA is a specific agonist for NMDA receptor mimicking the action of glutamate, the neurotransmitter which normally acts at that receptor.

IC_{50} & Target	Human Endogenous	NMDA Receptor

	Metabolite	
In Vitro	NMDA exerts a significant augmentation of the adrenal binding independently of the incubation temperature in a concentration-dependent manner[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.	
In Vivo	NMDA (0.2 nmol) shows significant effects on MF, IF, IL, and EL, respectively, decreasing the mount and intromission frequencies, and shortening the intromission and ejaculation latencies. NMDA and AP-5 significantly, respectively, facilitates and inhibits the ejaculatory behavior during the copulation testing 30 min. Bilateral microinjection of NMDA into PVN significantly increases the baseline LSNA, the peaking increment of LSNA occurred within 5 min from the time of NMDA microinjected into PVN[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.	

PROTOCOL

Kinase Assay [2]	Adrenal membranous homogenate suspensions are incubated with 10 nM [^{3}H]Glu in 500/zl 50 mM Tris-acetate buffer (pH 7.4) at 2°C or 30°C in the presence and absence of various compounds. Incubation is terminated by the addition of 3 mL ice-cold buffer and subsequent filtration through a Whatman GF/B glass filter under a constant vacuum of 15 mm Hg. After washing the filter 4 times with 3 mL icecold buffer, the radioactivity trapped on the filter is measured by a liquid scintillation spectrometer using 5 mL modified Triton-toluene scintillant at a counting efficiency of 40-42%. The radioactivity found in the presence of 1 mM non-radioactive Glu is subtracted from each experimental value to obtain the specific binding of [^{3}H]GIu in accordance with the y-aminobutyric acid (GABA) receptor binding assay system. The kinetic parameters of [^{3}H]GIu binding, K_d and Bma x, are calculated by Scatchard analysis of the specific binding using a personal computer with a programme for non-linear regression analysis developed in our own laboratory. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [1]	Thirty male rats are paired with different receptive females for a total of three times (once every 3 days) a week prior to the experiment, only the males that ejaculated at least three times during this period are included. After selecting the male rats with normal ejaculatory ability. Saline (100 nL), NMDA (0.20 nmol in 100 nL saline), and AP-5 (10.0 nmol in 100 nL saline) are adminitration into the bilateral PVN of each male rat in random order. After 5 min, the behavioral testing is performed and recorded as described above. Copulatory behaviors occur once a week and the entire experiment lasted 4 weeks. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Biomark Res. 2023 Aug 8;11(1):74.
- Mol Neurobiol. 2023 Dec 8.
- Mol Neurobiol. 2022 Dec 17.
- Mol Neurobiol. 2022 Oct 13.
- Heliyon. 2023 May 29, e16631.

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REFERENCES

[1]. Xia JD, et al. Centrally mediated ejaculatory response via sympathetic outflow in rats: role of N-methyl-D-aspartic acid receptors in paraventricular nucleus. Andrology. 2016 Nov 16.

[2]. Yoneda Y, et al. Enhancement of [3H]glutamate binding by N-methyl-D-aspartic acid in rat adrenal. Brain Res. 1987 Mar 17;406(1-2):24-31.

[3]. Jiang L, et al. Decrease of growth and differentiation factor 10 contributes to neuropathic pain through N-methyl-D-aspartate receptor activation. Neuroreport. 2017 May 24;28(8):444-450.

Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA