L-Phenylalanine

Cat. No.: HY-N0215

CAS No.: 63-91-2

Molecular Formula: $C_9H_{11}NO_2$

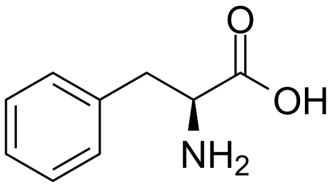
Molecular Weight: 165.19

Target: Calcium Channel; 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	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

H_2O : 6.67 mg/mL (40.38 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	6.0536 mL	30.2682 mL	60.5364 mL
	5 mM	1.2107 mL	6.0536 mL	12.1073 mL
	10 mM	0.6054 mL	3.0268 mL	6.0536 mL

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

BIOLOGICAL ACTIVITY

Description

L-Phenylalanine ((S)-2-Amino-3-phenylpropionic acid) is an essential amino acid isolated from Escherichia coli. L-Phenylalanine is a α2δ subunit of voltage-dependent Ca^+ channels antagonist with a K_i of 980 nM. L-phenylalanine is a competitive antagonist for the glycine- and glutamate-binding sites of N-methyl-D-aspartate receptors (NMDARs) (K_B of 573 μM) and non-NMDARs, respectively. L-Phenylalanine is widely used in the production of food flavors and pharmaceuticals[1][2][3][4].

IC_{50} & Target

Human Endogenous Metabolite

In Vitro

DAHP synthetase (DS) and chorismate mutase/prephenate dehydratase (CM/PD) are key enzymes in the L-Phenylalanine biosynthesis pathway. DS is sensitive to feedback inhibition by tyrosine, and CM/PD is subject to feedback inhibition by L-Phenylalanine[1].L-Phenylalanine attenuates non-NMDA receptor function in cultured neurons with an IC_{50} of 980 μM[5].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

The effects of L-Phenylalanine on NMDA-activated currents (I_{NMDA}) are studied in cultured hippocampal neurons from newborn rats using the patch-clamp technique. L-Phenylalanine specifically and reversibly attenuates I_{NMDA} in a

concentration-dependent manner (IC_{50} of 1.71 mM). L-Phenylalanine inhibits specifically NMDAR current in hippocampal neurons by competing for the glycine-binding site[3].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

REFERENCES

[1]. Wu WB, et al. Enhancement of l-phenylalanine production in Escherichia coli by heterologous expression of Vitreoscilla hemoglobin. Biotechnol Appl Biochem. 2018 May;65(3):476-483.

[2]. Mortell KH, et al. Structure-activity relationships of alpha-amino acid ligands for the alpha2delta subunit of voltage-gated calcium channels. Bioorg Med Chem Lett. 2006 Mar 1;16(5):1138-41.

[3]. Glushakov AV, et al. Specific inhibition of N-methyl-D-aspartate receptor function in rat hippocampal neurons by L-phenylalanine at concentrations observed during phenylketonuria. Mol Psychiatry. 2002;7(4):359-67.

[4]. Glushakov AV, et al. L-phenylalanine selectively depresses currents at glutamatergic excitatory synapses. J Neurosci Res. 2003 Apr 1;72(1):116-24.

[5]. Glushakov AV, et al. Long-term changes in glutamatergic synaptic transmission in phenylketonuria. Brain. 2005 Feb;128(Pt 2):300-7.

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