L-Arginine

Cat. No.: HY-N0455

CAS No.: 74-79-3

Molecular Formula: $C_6H_{14}N_4O_2$

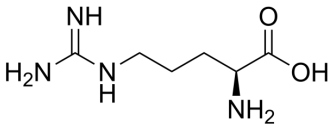
Molecular Weight: 174.2

Target: NO Synthase; Endogenous Metabolite

Pathway: Immunology/Inflammation; 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 : 50 mg/mL (287.03 mM; Need ultrasonic)

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	5.7405 mL	28.7026 mL	57.4053 mL
	5 mM	1.1481 mL	5.7405 mL	11.4811 mL
	10 mM	0.5741 mL	2.8703 mL	5.7405 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 100 mg/mL (574.05 mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

L-Arginine ((S)-(+)-Arginine) is the substrate for the endothelial nitric oxide synthase (eNOS) to generate NO. L-Arginine is transported into vascular smooth muscle cells by the cationic amino acid transporter family of proteins where it is metabolized to nitric oxide (NO), polyamines, or L-proline. L-Arginine is a potent vasodilator, and can be used to induce experimental acute pancreatitis[1][2][3][4][5].

IC_{50} & Target			
	Microbial Metabolite	Human Endogenous Metabolite	eNOS

In Vivo

Induction of experimental acute pancreatitis[4][5]
Background

L-Arginine is a substrate for endothelial nitric oxide synthase (eNOS) to produce NO, which can be metabolized into nitric oxide (NO), polyamines or L-proline, stimulating inflammatory responses. L-Arginine can also selectively destroy pancreatic acinar cells, leading to acute necrotizing pancreatitis.

Specific Mmodeling Methods

Rat[4]: male • Wistar albino rats • 150 g

Administration: 250 mg, 500 mg, 750 mg every 100 g body weight • ip for single dose • starved for 15 hours

Mice[5]: male • ICT mouse • 4-week-old • 25-30 g

Administration: total 450 mg/100 g body weight • ip for 2 doses, with 1 hr interval • sacrificed at 72 hours

Note

1. □□□□□□ 500 mg/100 g □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□ 250 mg □□□□□□□□□□□□□□□□□□□□ [4]□

2. □□□□□□□□□□[5]□□ L-Arginine □□□□□□ 0.9% □□□□□□□□ 5 N □□□□□ pH □ 7□□□ L-Arginine □□□□

Modeling Record

Appearance changes: weight loss, lower activity, softer hair

Tissue morphology: pancreatic edema, damage, atrophy, granulation tissue contraction and chalky spots (location of fat necrosis).

Cellular changes: basophils decrease and vesicles, cell pyknosis, nuclear fragmentation. Pancreatic albino cells disappear and die, and pancreatic tissue is replaced by monocytes and fibroblasts.

Molecular changes: serum amylase levels increase, and fat necrosis is obvious.

Correlated Product(s):
Curcumin (HY-N0005)

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

CUSTOMER VALIDATION

- Nat Protoc. 2021 Jan;16(1):431-457.
- Nutrients. 2023 Oct 18, 15(20), 4427.
- Viruses. 2021 Jun 26;13(7):1236.
- Dig Dis Sci. 2022 Jul 4.
- Pancreas. 2020 Jan;49(1):111-119.

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REFERENCES

[1]. Mizunuma T, et al. Effects of injecting excess arginine on rat pancreas. J Nutr. 1984 Mar;114(3):467-71.

[2]. Siriviriyakul P, et al. Effects of curcumin on oxidative stress, inflammation and apoptosis in L-arginine induced acute pancreatitis in mice. Heliyon. 2019 Aug 27;5(8):e02222.

[3]. Tapiero H, et al. I. Arginine. Biomed Pharmacother. 2002 Nov;56(9):439-45.

[4]. Bakker J, et al. Administration of the nitric oxide synthase inhibitor NG-methyl-L-arginine hydrochloride (546C88) by intravenous infusion for up to 72 hours can promote the resolution of shock in patients with severe sepsis: results of a randomized, double-blind, placebo-controlled multicenter study (study no. 144-002). Crit Care Med. 2004 Jan;32(1):1-12.

[5]. Yamada M, et al. Endothelial nitric oxide synthase-dependent cerebral blood flow augmentation by L-arginine after chronic statin treatment. J Cereb Blood Flow Metab. 2000 Apr;20(4):709-17.

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