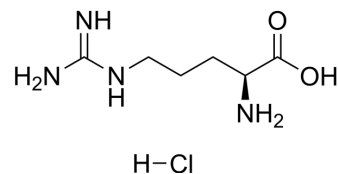


## L-Arginine hydrochloride

<b>Cat. No.:</b>	HY-N0455A
<b>CAS No.:</b>	1119-34-2
<b>Molecular Formula:</b>	C <sub>6</sub> H <sub>15</sub> ClN <sub>4</sub> O <sub>2</sub>
<b>Molecular Weight:</b>	210.66
<b>Target:</b>	NO Synthase; Endogenous Metabolite
<b>Pathway:</b>	Immunology/Inflammation; Metabolic Enzyme/Protease
<b>Storage:</b>	4°C, sealed storage, away from moisture * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



### SOLVENT & SOLUBILITY

<b>In Vitro</b>	H <sub>2</sub> O : 100 mg/mL (474.70 mM; Need ultrasonic)					
	DMSO : < 1 mg/mL (ultrasonic;warming;heat to 80°C) (insoluble or slightly soluble)					
	<b>Preparing Stock Solutions</b>	Solvent Concentration	Mass	1 mg	5 mg	10 mg
		1 mM		4.7470 mL	23.7349 mL	47.4699 mL
		5 mM		0.9494 mL	4.7470 mL	9.4940 mL
10 mM			0.4747 mL	2.3735 mL	4.7470 mL	
Please refer to the solubility information to select the appropriate solvent.						
<b>In Vivo</b>	1. Add each solvent one by one: PBS Solubility: 100 mg/mL (474.70 mM); Clear solution; Need ultrasonic					

### BIOLOGICAL ACTIVITY

<b>Description</b>	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 <sup>[1][2][3][4][5]</sup> .	
<b>IC<sub>50</sub> &amp; Target</b>	Microbial Metabolite	Human Endogenous Metabolite
<b>In Vitro</b>	Arginine is an α-amino acid. The L-form is one of the 20 most common natural amino acids. At the level of molecular genetics, in the structure of the messenger ribonucleic acid mRNA, CGU, CGC, CGA, CGG, AGA, and AGG, are the triplets of nucleotide bases or codons that code for arginine during protein synthesis. In mammals, arginine is classified as a semiessential or conditionally essential amino acid, depending on the developmental stage and health status of the individual.L-Arginine is associated with a decrease in cardiac index while stroke index is maintained in patients with severe sepsis. Resolution of shock at 72 hours is achieved by 40% and 24% of the patients in the L-Arginine and placebo cohorts,	

respectively. L-Arginine (450 mg/kg during a 15-minute period) amplifies and sustains the hyperemia (38%) and increases absolute brain blood flow after eNOS upregulation by chronic simvastatin treatment (2 mg/kg subcutaneously, daily for 14 days) in SV-129 mice.

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

## In Vivo

### Induction of experimental acute pancreatitis<sup>[4][5]</sup>

#### 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 Modeling Methods

Rat<sup>[4]</sup>: male • Wistar albino rats • 150 g

Administration: 250 mg, 500 mg, 750 mg every 100 g body weight (L-Arginine for example; HY-N0455) • ip for single dose • starved for 15 hours

Mice<sup>[5]</sup>: 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 L-Arginine (HY-N0455) 250 mg L-Arginine (HY-N0455)<sup>[4]</sup>
2. 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)

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## 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

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- [1]. 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.
- [2]. Tapiero H, et al. L-Arginine. Biomed Pharmacother. 2002 Nov;56(9):439-45.
- [3]. 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.
- [4]. Mizunuma T, et al. Effects of injecting excess arginine on rat pancreas. J Nutr. 1984 Mar;114(3):467-71.
- [5]. 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.
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**Caution: Product has not been fully validated for medical applications. For research use only.**

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