

## L-Arginine

## Chemical Properties

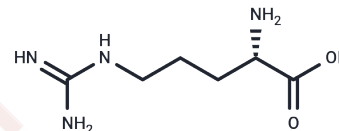
CAS No. : 74-79-3

Formula: C<sub>6</sub>H<sub>14</sub>N<sub>4</sub>O<sub>2</sub>

Molecular Weight: 174.20

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year

Actual storage temperature shall be subject to the COA.



## Biological Description

Description	L-Arginine (L-Arg) is a substrate for endothelial nitric oxide synthase (eNOS), participating in protein synthesis, polyamine production, and cellular signaling regulation. L-Arginine is transported into vascular smooth muscle cells via the cationic amino acid transporter family and metabolized into nitric oxide, polyamines, or L-proline. L-Arginine is an effective vasodilator and can be used to induce experimental acute pancreatitis.
Targets(IC50)	Endogenous Metabolite,NO Synthase,IL Receptor
In vitro	<p><b>Methods:</b> Primary human naive CD4+ and CD8+ T cells were cultured with L-Arginine (3-12 mM) for 48 hours. After 4 days, IL-2 was added and the cells were cultured for an additional 3 days. Following this, IL-2 was withdrawn and the cells were cultured further. Annexin V staining and flow cytometry were used to assess survival rates.</p> <p><b>Results:</b> High L-Arginine significantly increased the survival rate of CD4+ and CD8+ T cells after IL-2 withdrawal. [1]</p> <p><b>Methods:</b> Adult (8-10 weeks old) WT mouse hippocampal neural stem/progenitor cells (aNPCs) were treated with L-Arginine (100 or 500 μM) concurrently with BrdU labeling for 6-8 hours. BrdU incorporation assays assessed cell proliferation.</p> <p><b>Results:</b> L-Arginine treatment significantly increased the proliferation rate of WT-aNPCs. [2]</p>
In vivo	<p><b>Methods:</b> To investigate the effect of L-Arginine on T cell survival, BALB/c mice underwent adoptive transfer of HA-TCR transgenic CD4+ T cells, followed by immunization with HA peptide + CFA. Mice were then administered oral L-Arginine (1.5 mg/g body weight/day). Fifteen days post-immunization, the number of CD44hi donor T cells in draining lymph nodes was quantified by flow cytometry.</p> <p><b>Results:</b> In arginine-fed mice, donor T cell numbers were threefold higher than in controls. [1]</p> <p><b>Methods:</b> Nestin-GFP transgenic mice received continuous L-Arginine (100 μM) infusion via osmotic pump for 7 days. Analysis assessed activation status and cell cycle exit of Nestin-GFP+ radial glial-like cells (RGLs).</p> <p><b>Results:</b> L-Arginine infusion increased the proportion of activated RGLs and decreased the proportion of RGLs exiting the cell cycle. [2]</p> <p><b>Methods:</b> To investigate the acute effects of L-Arginine on catecholamine levels, normal rats received intraperitoneal injections of L-Arginine (600 mg/kg). Blood samples were collected 30 minutes post-administration, and plasma levels of epinephrine (AD),</p>

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In vivo	norepinephrine (NA), dopamine (DA), and DOPA were measured by high-performance liquid chromatography or fluorescence assay. <b>Results:</b> L-Arginine increased AD, NA, and DOPA levels by approximately 2-fold, while DA increased by 77.5%. [3]
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### Solubility Information

Solubility	DMSO: Insoluble, H <sub>2</sub> O: 104.00 mg/mL (597.01 mM), Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
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### Preparing Stock Solutions

	1mg	5mg	10mg
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
50 mM	0.1148 mL	0.5741 mL	1.1481 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

### Reference

- Geiger R, et al. L-Arginine Modulates T Cell Metabolism and Enhances Survival and Anti-tumor Activity. *Cell*. 2016 Oct 20;167(3):829-842.e13.
- Li T, Lu D, Yao C, et al. Kansl1 haploinsufficiency impairs autophagosome-lysosome fusion and links autophagic dysfunction with Koolen-de Vries syndrome in mice. *Nature Communications*. 2022, 13(1): 1-16.
- Xu M, et al. L-arginine homeostasis governs adult neural stem cell activation by modulating energy metabolism in vivo. *EMBO J*. 2023 Mar 15;42(6):e112647.
- Kurhaluk N, et al. L-Arginine and Intermittent Hypoxia Are Stress-Limiting Factors in Male Wistar Rat Models. *Int J Mol Sci*. 2024 Nov 18;25(22):12364.

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Tel: 781-999-4286 E\_mail: info@targetmol.com Address: 34 Washington Street, Wellesley Hills, MA 02481