

## L-Lactic acid

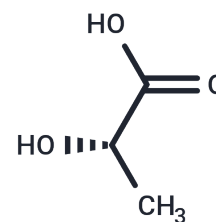
## Chemical Properties

CAS No. : 79-33-4

Formula: C<sub>3</sub>H<sub>6</sub>O<sub>3</sub>

Molecular Weight: 90.08

Storage: Store at low temperature, Keep away from direct sunlight  
 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-Lactic acid ((S)-2-Hydroxypropanoic acid) is a natural product produced by the anaerobic glycolysis of pyruvic acid. L-Lactic acid is a sensitive indicator of tissue hypoxia and can be used as a hemodynamic indicator in critically ill patients.  |
| Targets(IC50) | Endogenous Metabolite, Antibacterial, Antibiotic  |
| In vitro      | <p><b>METHODS:</b> Mouse CD4+CD25-T cells were treated with low-glucose medium containing L-Lactic acid (5-20 mM), and T cell proliferation was detected by Flow cytometry.</p> <p><b>RESULTS:</b> L-Lactic acid had a sustained inhibitory effect on T cell proliferation, and apoptosis-independent effect. [1]</p> <p><b>METHODS:</b> T cells were cultured in medium containing L-Lactic acid (20 mM), and ROS levels were measured using ROS and superoxide detection assay kits.</p> <p><b>RESULTS:</b> A significant reduction in ROS and O<sub>2</sub><sup>-</sup> production was observed in L-Lactic acid-treated T cells. [2]</p>  |
| In vivo       | <p><b>METHODS:</b> To study its effect on swimming endurance, L-Lactic acid (25-50 mg/kg in 0.9% NaCl) was administered intraperitoneally to ICR mice.</p> <p><b>RESULTS:</b> L-Lactic acid enhanced the swimming endurance of mice, and the effect was dose-dependent. [3]</p> <p><b>METHODS:</b> To investigate the effect on endotoxemia, L-Lactic acid (80 mg/kg) was intraperitoneally injected into mice, and 20 h later, a lethal dose of LPS (25 mg/kg) was intraperitoneally injected into mice to induce infectious shock.</p> <p><b>RESULTS:</b> L-Lactic acid significantly inhibited LPS-induced cytokine induction in mice following endotoxemia. L-Lactic acid treatment decreased glucose uptake and lactate output during LPS stimulation. [4]</p> |

## Solubility Information

|                     |  |
|---------------------|--|
| Solubility          | DMSO: 262 mg/mL (2908.53 mM), Sonication is recommended.<br>(< 1 mg/ml refers to the product slightly soluble or insoluble)                          |
| In vivo Formulation | 5% DMSO+95% Saline: 2.63 mg/mL (29.2 mM), Solution.<br>Saline: 50 mg/mL (555.06 mM), Solution.<br>10% DMSO+90% Saline: 5 mg/mL (55.51 mM), Solution. |

## A DRUG SCREENING EXPERT

### In vivo Formulation

Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.

### Preparing Stock Solutions

|       | 1mg        | 5mg        | 10mg        |
|-------|------------|------------|-------------|
| 1 mM  | 11.1012 mL | 55.5062 mL | 111.0124 mL |
| 5 mM  | 2.2202 mL  | 11.1012 mL | 22.2025 mL  |
| 10 mM | 1.1101 mL  | 5.5506 mL  | 11.1012 mL  |
| 50 mM | 0.222 mL   | 1.1101 mL  | 2.2202 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

Quinn WJ 3rd, et al. Lactate Limits T Cell Proliferation via the NAD(H) Redox State. Cell Rep. 2020 Dec 15;33(11):108500.

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Zhang G, et al. L-lactic acid's improvement of swimming endurance in mice. Int J Sport Nutr Exerc Metab. 2009 Dec;19(6):673-84.

Caslin HL, et al. Lactic Acid Inhibits Lipopolysaccharide-Induced Mast Cell Function by Limiting Glycolysis and ATP Availability. J Immunol. 2019 Jul 15;203(2):453-464.

Walenta S, Schroeder T, Mueller-Klieser W. Lactate in Solid Malignant Tumors: Potential Basis of a Metabolic Classification in Clinical Oncology[J]. Current Medicinal Chemistry, 2004, 11(16):2195-2204.

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