

3-Hydroxybutyric acid

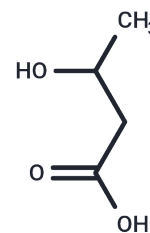
Chemical Properties

CAS No. : 300-85-6

Formula: C₄H₈O₃

Molecular Weight: 104.1

Storage: Store at low temperature, Store under nitrogen, Keep away from moisture, 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	Butanoic acid is an endogenous human metabolite, an endogenous histone deacetylase (HDAC) inhibitor. The IC ₅₀ of HDAC3, HDAC4 and HDAC1 were 2.4 mM, 4.5 mM and 5.3 mM, respectively. 3-Hydroxybutyric acid has the effects of energy metabolism, neuroprotection, anti-inflammatory, and improvement of insulin resistance.
Targets(IC ₅₀)	Endogenous Metabolite
In vitro	<p>METHODS: After HEK293 cells were treated with 3-Hydroxybutyric acid (10 mM) for 24 hours, the acetylation levels of histone H3K9 on the <i>_Foxo3a_</i> and <i>_Mt2_</i> promoters were detected.</p> <p>RESULTS: 3-Hydroxybutyric acid increases the acetylation of histone H3K9 in HEK293 cells on the <i>_Foxo3a_</i> and <i>_Mt2_</i> promoters. [1]</p> <p>METHODS: Mouse glial cells were treated with 3-Hydroxybutyric acid (10 mM) for 48 hours, and the cell proliferation was detected by the MTT assay.</p> <p>RESULTS: 3-Hydroxybutyric acid significantly promotes cell proliferation. [2]</p> <p>METHODS: Human monocytes were treated with 3-Hydroxybutyric acid (1-20 mM) for 24 hours, and the protein levels were detected by Western Blot.</p> <p>RESULTS: 3-Hydroxybutyric acid dose-dependently inhibits the production of IL-1β and IL-18 mediated by the NLRP3 inflammasome. [3]</p>
In vivo	<p>METHODS: To study the neuroprotective effect of 3-Hydroxybutyric acid, 3-Hydroxybutyric acid (2 mM or 5 mM) was injected intraventricular into C57BL/6 mice.</p> <p>RESULTS: 3-Hydroxybutyric acid reduces the binding of HDAC2 and HDAC3 to the pI promoter of <i>_Bdnf_</i>. [4]</p> <p>METHODS: To study the neuroprotective effect of 3-Hydroxybutyric acid, 3-Hydroxybutyric acid (5.0 mmol/kg) was intraperitoneally injected into neonatal mice after hypoxia-ischemia treatment.</p> <p>RESULTS: 3-Hydroxybutyric acid reduces the number of Tunel-positive cells in brain regions, reduces cerebral infarction, and thereby alleviates brain injury. [5]</p>

Solubility Information

A DRUG SCREENING EXPERT

Solubility	H2O: 200 mg/mL (1921.23 mM),Sonication is recommended. DMSO: 262.5 mg/mL (2521.61 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	9.6061 mL	48.0307 mL	96.0615 mL
5 mM	1.9212 mL	9.6061 mL	19.2123 mL
10 mM	0.9606 mL	4.8031 mL	9.6061 mL
50 mM	0.1921 mL	0.9606 mL	1.9212 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

- Shimazu T ,et al. Suppression of Oxidative Stress by β -Hydroxybutyrate, an Endogenous Histone Deacetylase Inhibitor[J]. Science, 2013, 339(6116):211-4.
- Liu W, You D, Lin J, et al.SGLT2 inhibitor promotes ketogenesis to improve MASH by suppressing CD8+ T cell activation.Cell Metabolism.2024
- Xiao X Q , et al .The effect of 3-hydroxybutyrate and its derivatives on the growth of glial cells[J].Biomaterials, 2007, 28(25):3608-3616.
- Youm YH, et al. The ketone metabolite β -hydroxybutyrate blocks NLRP3 inflammasome-mediated inflammatory disease. Nat Med. 2015 Mar;21(3):263-9.
- Sleiman S F ,et al. Exercise promotes the expression of brain derived neurotrophic factor (BDNF) through the action of the ketone body β -hydroxybutyrate[J].Elife, 2016.
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