Biotin

Cat. No.: HY-B0511

CAS No.: 58-85-5

Molecular Formula: $C_{10}H_{16}N_2O_3S$

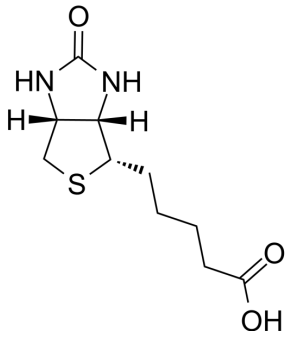
Molecular Weight: 244.31

Target: Endogenous Metabolite

Pathway: 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

DMSO : 100 mg/mL (409.32 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	4.0932 mL	20.4658 mL	40.9316 mL
5 mM	0.8186 mL	4.0932 mL	8.1863 mL
10 mM	0.4093 mL	2.0466 mL	4.0932 mL

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

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (10.23 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (10.23 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (10.23 mM); Clear solution
4. Add each solvent one by one: PBS
   Solubility: 1.96 mg/mL (8.02 mM); Clear solution; Need ultrasonic and warming and heat to 60°C

BIOLOGICAL ACTIVITY

Description

Biotin, vitamin B7 and serves as a coenzyme for five carboxylases in humans, involved in the synthesis of fatty acids, isoleucine, and valine, and in gluconeogenesis. Biotin is necessary for cell growth, the production of fatty acids, and the metabolism of fats and amino acids[1][2][3].

IC_{50} & Target	Microbial Metabolite	Human Endogenous Metabolite

In Vitro

Biotin exhibits higher affinity on breast cancer (T47D) cells over normal mammary epithelial (MCF-12A) cells, with K_ms of 9.24 μM and 53.1 μM, respecetively[4].
Biotin (0.09-100 μM; 0-70 min) is dose-dependently uptake by T47D cells with V_{max} of 27.34 pmol/mg protein/min[4].
Biotin (1-1000 nM; 24 h) exerts function in the recovery of 7β-OHC (50 μM)-induced cell death and reduces cell adhesion[5].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Viability Assay[5]

Cell Line:	Murine oligodendrocyte 158N cells
Concentration:	1, 10, 100, 1000 nM
Incubation Time:	24 hours
Result:	Showed cytoprotective effects and prevents 7β-hydroxycholesterol-induced disruption of redox status. Improved attenuation of oxidative stress, mitochondrial dysfunction, lipid metabolism alteration.

In Vivo

Biotin (15 mg/kg/d; p.o.; 12 d) improves nephrotoxicity in streptozotocin-induced (150 mg/kg; i.p.) diabetic mice[6].
Biotin (0.012 mg/kg/d; p.o.; 70 d) deficiency impaires the immune function of the head kidney, spleen and skin in fish with inadequate administration dose[7].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Streptozotocin-induced Diabetes type 1 in male Swiss albino mice (25±2 g)[6]
Dosage:	15 mg/kg/d
Administration:	Oral gavage; 12 days
Result:	Improved histopathological results, including distorted glomeruli, inflammatory cells, and giant macrophages, and diminished acroline reaction of oxidative damage.

Animal Model:	Grass carp (117±0.5 g)[7]
Dosage:	0.012, 0.110, 0.214, 0.311, 0.427, and 0.518 mg/kg
Administration:	Oral gavage; 70 days
Result:	Reduced the activities of lysozyme (LZ) and acid phosphatase (ACP), decreased the contents of complement 3 (C3), C4 and immunoglobulin M (IgM). Reduced the mRNA levels of anti-microbial substances. Increased the mRNA levels of pro-inflammatory cytokines, tumour necrosis factor partially and reduced anti-inflammatory IL-4/13A, IL-10, IL-11 and TGF-β1 mRNA levels partially in association with target of rapamycin (TOR) signaling.

CUSTOMER VALIDATION

- Mol Cell. 2023 Nov 20:S1097-2765(23)00914-0.
- Theranostics. 2020 May 22;10(15):6839-6853.
- MedComm. 2023 Apr 20.
- Pharmacol Res. 2022 Jan 5;106059.

- Cell Rep. 2024 Mar 18;43(3):113930.

See more customer validations on www.MedChemExpress.com

REFERENCES

[1]. Zempleni, et al. Biotin biochemistry and human requirements. J Nutr Biochem, 1999. 10(3): p. 128-38.

[2]. Mock, D.M.. Biotin status: which are valid indicators and how do we know? J Nutr, 1999. 129(2S Suppl): p. 498S-503S.

[3]. Zempleni J, et al. Biotin. Biofactors. 2009 Jan-Feb;35(1):36-46.

[4]. Vadlapudi AD, et al. Biotin uptake by T47D breast cancer cells: functional and molecular evidence of sodium-dependent multivitamin transporter (SMVT). Int J Pharm. 2013 Jan 30;441(1-2):535-43.

[5]. Sghaier R, et al. Biotin attenuation of oxidative stress, mitochondrial dysfunction, lipid metabolism alteration and 7β-hydroxycholesterol-induced cell death in 158N murine oligodendrocytes. Free Radic Res. 2019 May;53(5):535-561.

[6]. Aldahmash BA, et al. Biotin amelioration of nephrotoxicity in streptozotocin-induced diabetic mice. Saudi J Biol Sci. 2015 Sep;22(5):564-9.

[7]. He P, et al. Dietary biotin deficiency decreased growth performance and impaired the immune function of the head kidney, spleen and skin in on-growing grass carp (Ctenopharyngodon idella). Fish Shellfish Immunol. 2020 Feb;97:216-234.

Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA