

Product Data Sheet

Product Name: BCH (LAT1-IN-1)

Cat. No.: GC16516

Chemical Properties

Cas. No. 20448-79-7

Chemical Name (1S,2S,4R)-2-aminobicyclo[2.2.1]heptane-2-carboxylic acid

SMILES OC([C@]1([C@@H](CC2)C[C@@H]2C1)N)=O

Formula $C_8H_{13}NO_2$

M.Wt 155.2

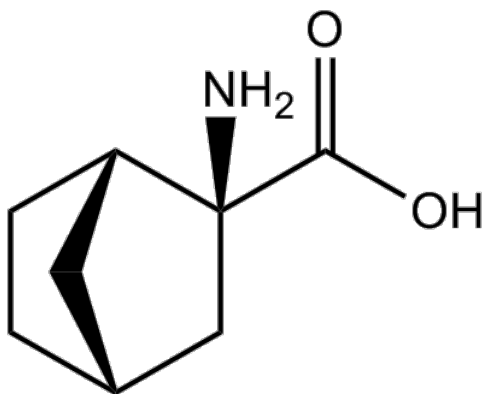
Solubility 10mg/mL in PBS, pH 7.2

Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice. All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

Caution: Product has not been fully validated for medical applications. For research use only.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Cell experiment [1]:

Cell lines KB human oral epidermoid carcinoma cells, Saos2 human osteogenic sarcoma cells, C6 rat glioma cells

Preparation Method KB cells were grown in MEM containing NEAA (non-essential amino acids) at a ratio of 100:1, supplemented with 5% FBS. Saos2 cells and C6 cells were grown in DMEM supplemented with 10% FBS. All cells were maintained as monolayers at 37°C in a humidified atmosphere containing 5% CO₂. Cells were treated with BCH at concentrations of 0.3, 1, 3, 10, 20, and 50mM for 0-3 days.

Reaction Conditions 0.3-50mM; 0-3 days.

Applications BCH significantly inhibited cell growth in a time- and dose-dependent manner, with IC₅₀ values of 6.9±0.4mM (KB, 3 days), 5.6±0.7mM (Saos2, 3 days), and 6.5±0.9mM (C6, 3 days). BCH treatment induced internucleosomal DNA fragmentation, increased the number of TUNEL-positive cells, and promoted proteolytic cleavage of procaspase-7 in all three cell types, as well as procaspase-3 in KB and C6 cells, indicating activation of caspase-3/7 and induction of apoptotic cell death.

Animal experiment [2]:

Animal models BALB/c nude mice

Caution: Product has not been fully validated for medical applications. For research use only.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Preparation Method HuCCT1 cells (1×10^7 cells) were inoculated subcutaneously into the flank of the mice. After tumor volumes reached approximately 100mm^3 , mice were divided into control and treatment groups ($n=10$). The treatment groups mice treated with BCH (200mg/kg) for 14 days.

Dosage form 200mg/kg; i.v.; once daily for 14 days.

Applications BCH significantly suppressed growth of the tumor and yielded an additive therapeutic efficacy to gemcitabine and 5-FU.

References:

- [1] Kim CS, Cho SH, Chun HS, et al. BCH, an inhibitor of system L amino acid transporters, induces apoptosis in cancer cells. *Biol Pharm Bull.* 2008 Jun;31(6):1096-100.
- [2] Kaira K, Sunose Y, Ohshima Y, et al. Clinical significance of L-type amino acid transporter 1 expression as a prognostic marker and potential of new targeting therapy in biliary tract cancer. *BMC Cancer.* 2013 Oct 16;13:482.

Background

BCH (LAT1-IN-1) is a selective and competitive inhibitor of the L-type amino acid transporter 1 (LAT1). BCH inhibits cancer cell growth and induces apoptosis by suppressing cellular amino acid uptake and mTOR phosphorylation. BCH can be used in research related to cancers such as esophageal cancer^[1-4].

In vitro, BCH (10mM) treated endometrial cancer cell lines (Ishikawa, RL95-2, HEC1A, KLE) for 15 minutes to 8 days. BCH significantly inhibited cellular leucine uptake; it suppressed cell growth and spheroid formation while reducing mTORC1 signaling pathway activation^[5]. BCH (0.3–50mM) treated KB human oral epidermoid carcinoma cells, Saos2 human osteosarcoma cells, and C6 rat glioma cells for 0–3 days. BCH significantly inhibited cell growth and induced DNA fragmentation, apoptosis, and activation of caspase-3/7^[6].

Caution: Product has not been fully validated for medical applications. For research use only.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

In vivo, BCH (240mg/kg) was intraperitoneally injected into HFD/STZ-induced T2DM and db/db mouse models for one week. BCH alleviated diabetic neuropathic pain symptoms^[7]. BCH (200mg/kg) was intravenously injected into BALB/c nude mice inoculated with HuCCT1 cholangiocarcinoma cells for 14 days. BCH significantly suppressed tumor growth and enhanced the therapeutic efficacy of gemcitabine and 5-FU^[8].

References:

- [1] Ohshima Y, Kaira K, Yamaguchi A, et al. Efficacy of system I amino acid transporter 1 inhibition as a therapeutic target in esophageal squamous cell carcinoma. *Cancer Sci.* 2016 Oct;107(10):1499-1505.
- [2] Singh N, Scalise M, Galluccio M, et al. Discovery of Potent Inhibitors for the Large Neutral Amino Acid Transporter 1 (LAT1) by Structure-Based Methods. *Int J Mol Sci.* 2018 Dec 21;20(1):27.
- [3] Wang Q, Holst J. L-type amino acid transport and cancer: targeting the mTORC1 pathway to inhibit neoplasia. *Am J Cancer Res.* 2015 Mar 15;5(4):1281-94.
- [4] Lee Y, Jin C, Ohgaki R, et al. Structural basis of anticancer drug recognition and amino acid transport by LAT1. *Nat Commun.* 2025 Feb 14;16(1):1635.
- [5] Marshall AD, van Geldermalsen M, Otte NJ, et al. LAT1 is a putative therapeutic target in endometrioid endometrial carcinoma. *Int J Cancer.* 2016 Dec 1;139(11):2529-39.
- [6] Kim CS, Cho SH, Chun HS, et al. BCH, an inhibitor of system L amino acid transporters, induces apoptosis in cancer cells. *Biol Pharm Bull.* 2008 Jun;31(6):1096-100.
- [7] Zhou ZY, Wang JY, Li ZX, et al. Branched-Chain Amino Acids Deficiency Promotes Diabetic Neuropathic Pain Through Upregulating LAT1 and Inhibiting Kv1.2 Channel. *Adv Sci (Weinh).* 2024 Sep;11(33):e2402086.
- [8] Kaira K, Sunose Y, Ohshima Y, et al. Clinical significance of L-type amino acid transporter 1 expression as a prognostic marker and potential of new targeting therapy in biliary tract cancer. *BMC Cancer.* 2013 Oct 16;13:482.

Caution: Product has not been fully validated for medical applications. For research use only.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA