

Product Data Sheet

Product Name: Hyocholic Acid

Cat. No.: GC40717

Chemical Properties

Cas. No. 547-75-1

Chemical Name (5 β)-3 α ,6 α ,7 α -trihydroxy-cholan-24-oic acid

SMILES C[C@H](CCC(O)=O)[C@@]1([H])CC[C@@]2([H])[C@]3([H])[C@H](O)[C@H](O)[C@]4([H])C[C@H](O)CC[C@]4(C)[C@@]3([H])CC[C@@]21C

Formula C₂₄H₄₀O₅

M.Wt 408.6

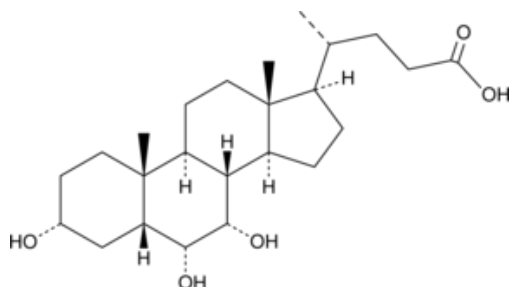
Solubility 30 mg/ml in DMF, 20 mg/ml in DMSO, 20 mg/ml in Ethanol

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

Cell experiment [1]:

Cell lines STC-1 and NCI-H716 cells

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

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Cells were treated with different concentrations (5, 25, and 50 μ M) of Hyocholic Acid with 24h treatment for determination of GLP-1 secretion and proglucagon transcription.

Reaction Conditions
5, 25, 50 μ M; 24h

Applications
Hyocholic Acid upregulates GLP-1 protein secretion and proglucagon gene transcription in STC-1 and NCI-H716 cells.

Animal experiment [2]:

Animal models
C57BL/6 mice

C57BL/6 mice were randomized into the normal control (NC), NASH, NASH+vehicle, NASH+10mg/kg Hyocholic Acid, and NASH+100mg/kg Hyocholic Acid groups, respectively. Except for those in the NC group with a normal diet, all the mice were exposed to the high-fat high-cholesterol(HFHC) diet (2% cholesterol, 10% lard, and 88% normal diet) for 16 weeks.

Dosage form
10、 100mg/kg; p.o.

Applications
Hyocholic Acid attenuated rodent liver steatosis induced by the HFHC diet. Hyocholic Acid treatment dose-dependently reduced the production of lipid peroxides. Hyocholic Acid treatment dose-dependently prevented hepatocytes from the apoptotic process.

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References:

[1]Zheng X, Chen T, Jiang R, et al. Hyocholic acid species improve glucose homeostasis through a distinct TGR5 and FXR signaling mechanism[J]. Cell metabolism, 2021, 33(4): 791-803. e7.

[2]Xie Y, Shen F, He Y, et al. Gamma-muricholic acid inhibits nonalcoholic steatohepatitis: Abolishment of steatosis-dependent peroxidative impairment by FXR/SHP/LXR α /FASN signaling[J]. Nutrients, 2023, 15(5): 1255.

Background

Hyocholic acid (γ -Muricholic acid) is the major bile acid in pigs and other mammals and is also found in urine samples of patients with cholestasis^[1]. Hyocholic acid promotes intracellular glucagon-like peptide-1 (GLP-1) secretion by activating G protein-coupled bile acid receptor (TGR5) and inhibiting farnesoid X receptor (FXR), thereby improving glucose homeostasis^[2]. Hyocholic acid can be used as a novel biomarker for metabolic disorders and can resist type 2 diabetes^[3].

In vitro, treatment of STC-1 and NCI-H716 cells with hyocholic acid (25, 50 μ M) for 24 h upregulated GLP-1 protein secretion and proglucagon gene transcription in cells ^[4].

In vivo, oral treatment of diabetic mice with hyocholic acid (100 mg/kg) reduced blood glucose levels, increased fasting insulin levels, and upregulated serum GLP-1 levels through TGR5 and FXR signaling in vivo ^[4]. Oral treatment of nonalcoholic hepatitis mice with hyocholic acid (10, 100 mg/kg) for 16 weeks alleviated hepatic steatosis induced by a high-fat, high-cholesterol (HFHC) diet, reduced the production of lipid peroxides in a dose-dependent manner, and prevented hepatocyte apoptosis^[5].

References:

[1] Lundell K, Wikvall K. Species-specific and age-dependent bile acid composition: aspects on CYP8B and CYP4A subfamilies in bile acid biosynthesis[J]. Current drug metabolism, 2008, 9(4): 323-331.

[2] Jia W, Rajani C, Zheng X, et al. Hyocholic acid and glycemic regulation: Comments on 'Hyocholic acid species improve glucose homeostasis through a distinct TGR5 and FXR signaling

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mechanism'[J]. Journal of Molecular Cell Biology, 2021, 13(6): 460-462.

[3] Zheng X, Chen T, Zhao A, et al. Hyocholic acid species as novel biomarkers for metabolic disorders[J]. Nature communications, 2021, 12(1): 1487.

[4] Zheng X, Chen T, Jiang R, et al. Hyocholic acid species improve glucose homeostasis through a distinct TGR5 and FXR signaling mechanism[J]. Cell metabolism, 2021, 33(4): 791-803. e7.

[5] Xie Y, Shen F, He Y, et al. Gamma-muricholic acid inhibits nonalcoholic steatohepatitis: Abolishment of steatosis-dependent peroxidative impairment by FXR/SHP/LXR α /FASN signaling[J]. Nutrients, 2023, 15(5): 1255.

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