

Product Data Sheet

Product Name: Ursodiol
Cat. No.: GC13363

Chemical Properties

Cas. No. 128-13-2

Chemical Name (4R)-4-[(3R,5S,7S,8R,9S,10S,13R,14S,17R)-3,7-dihydroxy-10,13-dimethyl-2,3,4,5,6,7,8,9,11,12,14,15,16,17-tetradecahydro-1H-cyclopenta[a]phenanthren-17-yl]pentanoic acid

SMILES CC(CCC(=O)O)C1CCC2C1(CCC3C2C(CC4C3(CCC(C4)O)C)O)C

Formula $C_{24}H_{40}O_4$

M.Wt 392.57

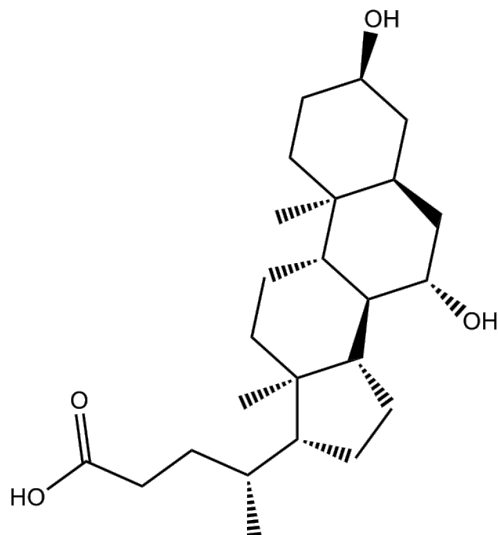
Solubility $\geq 16\text{mg/mL}$ in DMSO

Storage Store at 4°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]:

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Cell lines	Hepatoma cells BEL7402 and HepG2 and normal liver cells L-02
Preparation Method	Hepatoma cells BEL7402 and HepG2 and normal liver cells L-02 were treated with Ursodiol at concentrations ranging from 0.05mmol/L to 1.0mmol/L, and the cell growth inhibition rate was detected by MTT method at 48 hours, 72 hours and 96 hours.
Reaction Conditions	0.05 mmol/L-1.0 mmol/L, 48,72 and 96 h
Applications	Ursodiol can inhibit the viability of HepG2 and BEL7402 cells. After 48 hours of Ursodiol treatment, the IC ₅₀ values of HepG2 and BEL7402 were 0.92 mmol/L and 0.86 mmol/L, respectively.

Animal experiment [2]:

Animal models	C57BL/6J wildtype mice
Preparation Method	Five-week-old C57BL/6J WT mice (male and female) were treated with three different doses of Ursodiol (50, 150 and 450 mg/kg) for 21 days, and the mice were weighed daily during the experimental period.
Dosage form	50, 150 and 450 mg/kg/day, 21 days, i.g.

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Applications

Compared with the control mice, the mice in the 50 and 450 mg/kg Ursodiol treatment groups continued to lose weight within one week of Ursodiol administration, and there was no significant difference in the body weight of the mice in the 150 mg/kg Ursodiol treatment group.

References:

- [1] Liu H, Qin CY, Han GQ, Xu HW, Meng M, Yang Z. Mechanism of apoptotic effects induced selectively by ursodeoxycholic acid on human hepatoma cell lines. *World J Gastroenterol*. 2007 Mar 21;13(11):1652-8.
- [2] Winston JA, Rivera A, Cai J, Patterson AD, Theriot CM. Secondary bile acid ursodeoxycholic acid alters weight, the gut microbiota, and the bile acid pool in conventional mice. *PLoS One*. 2021 Feb 18;16(2):e0246161.

Background

Ursodiol (UDCA) is a secondary bile acid derived from the $7\alpha/\beta$ isomerization of the primary bile acid chenodeoxycholic acid (CDCA) by microorganisms. Ursodiol can be used in the study of various liver diseases and gastrointestinal diseases. Ursodiol has cytoprotective, anti-apoptotic, membrane-stabilizing, antioxidant and immunomodulatory effects^[1-3].

Ursodiol can inhibit the viability of HepG2 and BEL7402 cells with IC₅₀ of 0.92 mmol/L and 0.86 mmol/L, respectively, but Ursodiol has no effect on the viability of normal hepatocytes L-02. After Ursodiol (1.0 mmol/L) treatment, the apoptosis rate of HepG2 and BEL7402 cells was significantly increased in a concentration-dependent manner, whereas the apoptosis rate of L-02 cells did not change significantly. Ursodiol inhibits Bcl-2 expression and promotes Bax expression [2].

Mice treated with low and high doses (50 and 450 mg/kg/day) of Ursodiol showed significant weight loss, whereas 150 mg/kg/day had no significant effect on mouse body weight. After 21 days of ursodiol treatment, the microbial community structure and bile acid pool in the ileum and cecum contents and feces of mice were significantly changed compared with those before treatment. Ursodeoxycholic acid (UDCA), Tauroursodeoxycholic acid (TUDCA), Glycoursodeoxycholic acid (GUDCA) and Lithocholic acid (LCA) levels were significantly elevated in the ileum of mice treated

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with Ursodiol 450 mg/kg^[1]. Ursodiol treatment at 416 mg/kg reduces SARS-CoV-2 transmission in a Syrian golden hamster SARS-CoV-2 infection model^[4].

References:

- [1] Winston JA, Rivera A, Cai J, Patterson AD, Theriot CM. Secondary bile acid ursodeoxycholic acid alters weight, the gut microbiota, and the bile acid pool in conventional mice. PLoS One. 2021 Feb 18;16(2):e0246161.
- [2] Liu H, Qin CY, Han GQ, Xu HW, Meng M, Yang Z. Mechanism of apoptotic effects induced selectively by ursodeoxycholic acid on human hepatoma cell lines. World J Gastroenterol. 2007 Mar 21;13(11):1652-8.
- [3] Kumar D, Tandon RK. Use of ursodeoxycholic acid in liver diseases. J Gastroenterol Hepatol. 2001 Jan;16(1):3-14.
- [4] Brevini T, Maes M, Webb G J, et al. FXR inhibition may protect from SARS-CoV-2 infection by reducing ACE2[J]. Nature, 2023, 615(7950): 134-142.

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