

Product Data Sheet

Product Name: Cholestenone

Cat. No.: GC31590

Chemical Properties

Cas. No. 601-57-0

SMILES CC(C)CCC[C@@H](C)[C@H]1CC[C@@]2([H])[C@]3([H])CCC4=CC(CC[C@]4(C)[C@]3([H])CC[C@]12C)=O

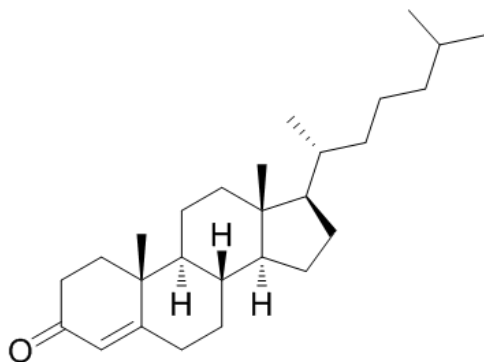
Formula $C_{27}H_{44}O$ M.Wt 384.64

Solubility DMF: 0.1 mg/ml, Ethanol: 2 mg/ml 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.

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Cell experiment [1]:	
Cell lines	A549 and SPC-A-1 cells
Preparation Method	A549 and SPC-A-1 cells were serum-starved for 4h and treated with 10-400μM Cholestenone for 24h, then cell viability was assessed using the CCK-8 assay.
Reaction Conditions	10, 25, 50, 100, 200, and 400μM; 24h
Applications	Cholestenone treatment for 24h reduced cell viabilities in a dose-dependent manner. Cholestenone did not depress viabilities of A549 and SPC-A-1 cells at the concentration of 10μM but strikingly inhibited cell growth at the concentration of 25μM up to 400μM.
Animal experiment [2]:	
Animal models	db/db mice
Preparation Method	db/db mice were fed a 0.25% Cholestenone-supplemented diet for 4 weeks, then plasma triglyceride levels were measured using the Triglyceride E-test kit, and fecal free fatty acid contents were measured using the NEFA C-test kit.
Dosage form	0.25% Cholestenone-supplemented diet (2.5g/kg diet); p.o. (free access to diet)

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Applications	Dietary Cholestenone significantly decreased plasma triglyceride levels, and fecal free fatty acid contents were markedly increased in Cholestenone-fed mice.
References:[1] Ma J, Fu G, Wu J, et al. 4-cholesten-3-one suppresses lung adenocarcinoma metastasis by regulating translocation of HMGB1, HIF1 α and Caveolin-1[J]. Cell death & disease, 2016, 7(9): e2372-e2372.[2] Higuchi M, Okumura M, Mitsuta S, et al. Dietary Cholest-4-en-3-one, a cholesterol metabolite of gut microbiota, alleviates hyperlipidemia, hepatic cholesterol accumulation, and hyperinsulinemia in obese, diabetic db/db mice[J]. Metabolites, 2024, 14(6): 321.	

Background

Cholestenone is an orally active intermediate oxidation product of cholesterol that is mainly metabolized in the liver^[1]. Cholestenone exhibits high mobility in cell membranes, can affect cholesterol turnover and efflux processes, and can participate in cholesterol metabolism, bile acid synthesis, and lipid signaling regulation^[2]. Cholestenone is commonly used in research related to lipid metabolism, steroidal signaling pathways, and cell membrane dynamics^[3,4].

In vitro, treatment of *Helicobacter pylori* ATCC 43504 with Cholestenone (150 μ M) for 2 days significantly inhibited the biosynthesis of the cell wall glycolipid CGL and its derivatives CAG and CPG^[5]. Treatment of A549 and SPC-A-1 cells with Cholestenone (25-400 μ M) for 24h dose-dependently reduced cell viability^[6].

In vivo, db/db mice fed a diet containing 0.25% Cholestenone for 4 weeks showed significantly reduced plasma triglyceride levels and significantly increased fecal free fatty acid content^[7]. Male CDF1 mice fed diets containing 0.1%, 0.3%, and 0.5% Cholestenone for 5 months showed dose-dependent increases in the degree of body weight suppression^[8].

References:

- [1] Neuvonen M, Manna M, Morkkila S, et al. Enzymatic oxidation of cholesterol: properties and functional effects of cholestenone in cell membranes[J]. PLoS One, 2014, 9(8): e103743.
 [2] Xu F, Rychnovsky S D, Belani J D, et al. Dual roles for cholesterol in mammalian cells[J].

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[3] Tomkins G M, Nichols Jr C W, Chapman D D, et al. Use of Δ^4 -cholestenone to reduce the level of serum cholesterol in man[J]. Science, 1957, 125(3254): 936-937.

[4] Roth A T, Philips J A, Chandra P. The role of cholesterol and its oxidation products in tuberculosis pathogenesis[J]. Immunometabolism (Cobham, Surrey), 2024, 6(2): e00042.

[5] Kobayashi J, Kawakubo M, Fujii C, et al. Cholestenone functions as an antibiotic against *Helicobacter pylori* by inhibiting biosynthesis of the cell wall component CGL[J]. Proceedings of the National Academy of Sciences, 2021, 118(16): e2016469118.

[6] Ma J, Fu G, Wu J, et al. 4-cholesten-3-one suppresses lung adenocarcinoma metastasis by regulating translocation of HMGB1, HIF1 α and Caveolin-1[J]. Cell death & disease, 2016, 7(9): e2372-e2372.

[7] Higuchi M, Okumura M, Mitsuta S, et al. Dietary Cholest-4-en-3-one, a cholesterol metabolite of gut microbiota, alleviates hyperlipidemia, hepatic cholesterol accumulation, and hyperinsulinemia in obese, diabetic db/db mice[J]. Metabolites, 2024, 14(6): 321.

[8] SUZUKI K. Anti-obesity effect of cholest-4-en-3-one, an intestinal catabolite of cholesterol, on mice[J]. Journal of nutritional science and vitaminology, 1993, 39(5): 537-543.

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