27-Hydroxycholesterol

Cat. No.: HY-N2371

CAS No.: 20380-11-4

Molecular Formula: $C_{27}H_{46}O_2$

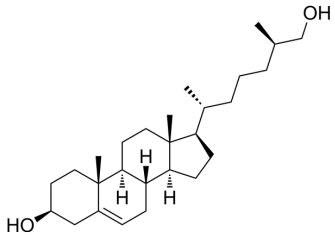
Molecular Weight: 402.65

Target: Estrogen Receptor/ERR; LXR; Endogenous Metabolite

Pathway: Vitamin D Related/Nuclear Receptor; 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

Ethanol : 16.67 mg/mL (41.40 mM; Need ultrasonic)
DMSO : 1 mg/mL (2.48 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	2.4835 mL	12.4177 mL	24.8355 mL
5 mM	0.4967 mL	2.4835 mL	4.9671 mL
10 mM	0.2484 mL	1.2418 mL	2.4835 mL

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

In Vivo

1. Add each solvent one by one: 10% EtOH >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 1.67 mg/mL (4.15 mM); Clear solution
2. Add each solvent one by one: 10% EtOH >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: 1 mg/mL (2.48 mM); Suspended solution; Need ultrasonic
3. Add each solvent one by one: 10% EtOH >> 90% corn oil
   Solubility: ≥ 1 mg/mL (2.48 mM); Clear solution
4. Add each solvent one by one: 10% EtOH >> 90% corn oil
   Solubility: ≥ 1 mg/mL (2.48 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

27-Hydroxycholesterol (27-OHC) is a selective estrogen receptor modulator and an agonist of the liver X receptor.

IC_{50} & Target

Human Endogenous Metabolite

In Vitro	27-Hydroxycholesterol is an endogenous selective estrogen receptor modulator that displays significant partial agonist activity in a variety of cellular models of estrogen receptor action. It positively regulates both gene transcription and cell proliferation in cellular models of breast cancer[1]. 27-Hydroxycholesterol, through estrogen receptor activation, triggers deleterious effect in prostate cancer cell lines. 27-Hydroxycholesterol significantly increases cell proliferation of LNCaP and PC3 cells and this effect can be attenuated by estrogen receptor inhibitors[2]. 27-Hydroxycholesterol is an oxysterol produced from cholesterol by the monooxygenase CYP27A1, which regulates intracellular cholesterol homeostasis. 27-Hydroxycholesterol also acts as an endogenous selective estrogen receptor modulator capable of increasing breast cancer growth and metastasis. 27-Hydroxycholesterol levels can be modulated by statins or direct inhibition of CYP27A1, thereby attenuating its pro-tumorigenic activities[3]. 27-hydroxylation of cholesterol is an important pathway for LXR activation in response to cholesterol overload[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay	Stock solutions of 27-Hydroxycholesterol are prepared in 100% ethanol and stored at −80°C. 27-Hydroxycholesterol stock solution is dissolved in appropriate volumes of media to prepare the working solutions of 1 μM. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [2]	Proliferation assays are conducted on black 96 well plates using a commercial kit which quantifies cell number using DNA content and membrane integrity. LNCaP and PC3 cells are treated with 1 μM 27-Hydroxycholesterol for 48 hours[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Sci Adv. 15 Jul 2022.
- Mov Disord. 2023 Aug 18.

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REFERENCES

[1]. DuSell CD, et al. 27-hydroxycholesterol is an endogenous selective estrogen receptor modulator. Mol Endocrinol. 2008 Jan;22(1):65-77.

[2]. Raza S, et al. The cholesterol metabolite 27-hydroxycholesterol stimulates cell proliferation via ERβ in prostate cancer cells. Cancer Cell Int. 2017 May 11;17:52.

[3]. Kimbung S, et al. Impact of 27-hydroxylase (CYP27A1) and 27-hydroxycholesterol in breast cancer. Endocr Relat Cancer. 2017 Jul;24(7):339-349.

[4]. Fu X, et al. 27-hydroxycholesterol is an endogenous ligand for liver X receptor in cholesterol-loaded cells. J Biol Chem. 2001 Oct 19;276(42):38378-87.

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