Beta-Sitosterol (purity>80%)

Cat. No.: HY-N0171

CAS No.: 83-46-5

Molecular Formula: $C_{29}H_{50}O$

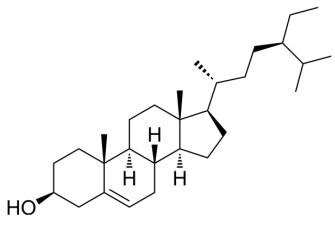
Molecular Weight: 414.71

Target: Apoptosis; Endogenous Metabolite

Pathway: Apoptosis; Metabolic Enzyme/Protease

Storage: -20°C, protect from light

* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

Ethanol : 3.85 mg/mL (9.28 mM; Need ultrasonic)

DMSO : 1 mg/mL (2.41 mM; Need ultrasonic)

H_2O : < 0.1 mg/mL (ultrasonic) (insoluble)

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	2.4113 mL	12.0566 mL	24.1132 mL
	5 mM	0.4823 mL	2.4113 mL	4.8226 mL
	10 mM	---	---	---

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

In Vivo

1. Add each solvent one by one: 0.5% CMC-Na/saline water
   Solubility: 20 mg/mL (48.23 mM); Suspended solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

Beta-Sitosterol (purity>80%) includes β-sitosterol (≥80%), stigmasterol, campesterol and brassicasterol mainly. Beta-Sitosterol is a plant sterol. Beta-Sitosterol (purity>80%) interfere with multiple cell signaling pathways, including cell cycle, apoptosis, proliferation, survival, invasion, angiogenesis, metastasis and inflammation[1].

In Vitro

Bioactivity-guided isolation afforded three compounds from the hexane fraction of E. indica, namely, Beta-Sitosterol (β-sitosterol), Stigmasterol, and Lutein. Both compounds are found to possess very low PPL inhibition activity, that is, 2.99±0.80% (Beta-Sitosterol) of inhibition at 100 μg/mL (242 μM) and 2.68±0.38% (Stigmasterol) of inhibition at 100 μg/mL (243 μM), respectively. Weak PPL inhibition activity of Beta-Sitosterol and Stigmasterol isolated from Alpinia zerumbet with IC_{50} value of 99.99±1.86 μg/mL and 125.05±4.76 μg/mL, respectively, in comparison with the inhibition shown by Curcumin (IC_{50}=4.92±0.21 μg/mL) and Quercetin (IC_{50}=18.60±0.86 μg/mL) which are used as positive controls in their study. Beta-Sitosterol and Stigmasterol are recorded with weak PPL inhibitory activity of only 3.0±0.8% and 2.7±0.4% at 100 μg/mL, respectively, (i.e., 242 μM and 243 μM) in contrast (34.5±5.4% at 100 μg/mL), which are comparatively lower than that

	recorded in literature (i.e., 50% PPL inhibition at 100 μg/mL)[1]. Sitosterol is an important compound extracted from the leaves of Aloe vera. It inhibits the growth of promastigotes of L. donovani, a causative agent for life threatening visceral leishmaniasis disease[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Beta-Sitosterol (β-sitosterol) treatment significantly reduced the immobility time at three doses (10, 20, and 30 mg/kg) in the Forced Swim Test (FST) and Tail Suspension Test (TST), indicating an antidepressant effect. This effect is similar to the positive control fluoxetine at a dose of 30 mg/kg, where the strongest effect is observed compared with the control group ($P < 0.001$). The same effects are observed for three doses of Beta-Sitosterol in the TST. The % DID values are as follows: FST: 39.27% (10 mg/kg), 51.23% (20 mg/kg), and 57.48% (30 mg/kg); TST: 31.63% (10 mg/kg), 43.95% (20 mg/kg), and 53.38% (30 mg/kg). These results indicate that Beta-Sitosterol has a significant antidepressant activity in mice during the FST and TST. Furthermore, Beta-Sitosterol exhibits the antidepressant effect in a dose-dependent manner[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration [3]	Mice[3] Male ICR mice (20±2 g) and male KunMing mice (20±2 g) are used. Local breed, male ICR mice (20±2 g) are used in the FST under standard conditions with free access to food and water. Mice are randomly divided into four groups (8 mice per group are used) for the tail suspension test (TST): Beta-Sitosterol (10, 20, and 30 mg/kg), total sterols (50, 100, and 200 mg/kg), fluoxetine (20 mg/kg), or distilled water. 80 male mice are used. Briefly, the vehicle or test drugs are administered 30 min before a test session acute ip injection. Then, mice are individually suspended by tail with clamp (2 cm from the tip of the end) in a box (25 cm×25 cm×30 cm) with the head 5 cm to the bottom. Testing is carried out in a darkened room with minimal background noise. All animals are suspended for total 6 min, and the duration of immobility is observed and measured during the final 4-min interval of the test. All test sessions are recorded by a video camera positioned directly above the box. Two competent observers blind to treatment scored the videotapes. Mice consider immobile only when they hung passively and completely motionless. The animals are used only once in this test. All TSTs are performed between 11:00 A.M. and 14:00 P.M. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Acta Neuropathol Commun. 2020 Apr 22;8(1):56.
- Front Oncol. 2022 Aug 10;12:882784.
- Biosci Rep. 2020 Oct 30;40(10):BSR20201349.
- Research Square Preprint. 2021. Jul.
- Evid-Based Compl Alt. 2020 Apr 29;2020:2760979.

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REFERENCES

[1]. Bin Sayeed MS, et al. Beta-Sitosterol: A Promising but Orphan Nutraceutical to Fight Against Cancer. Nutr Cancer. 2015;67(8):1214-20.

[2]. Tariq A, et al. Ethnomedicines and anti-parasitic activities of Pakistani medicinal plants against Plasmodia and Leishmania parasites. Ann Clin Microbiol Antimicrob. 2016 Sep 20;15(1):52.

[3]. Zhao D, et al. Structural Features and Potent Antidepressant Effects of Total Sterols and β-sitosterol Extracted from Sargassum horneri. Mar Drugs. 2016 Jun 28;14(7).

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