Scopoletin

Cat. No.: HY-N0342

CAS No.: 92-61-5

Molecular Formula: $C_{10}H_8O_4$

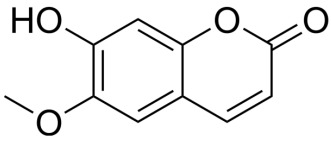
Molecular Weight: 192.17

Target: Cholinesterase (ChE); Apoptosis

Pathway: Neuronal Signaling; Apoptosis

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

DMSO : 62.5 mg/mL (325.23 mM; Need ultrasonic)
Ethanol : < 1 mg/mL (ultrasonic) (insoluble)

Preparing Stock Solutions

Concentration \ Solvent \ Mass	1 mg	5 mg	10 mg
1 mM	5.2037 mL	26.0186 mL	52.0373 mL
5 mM	1.0407 mL	5.2037 mL	10.4075 mL
10 mM	0.5204 mL	2.6019 mL	5.2037 mL

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

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (10.82 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: 2.08 mg/mL (10.82 mM); Suspended solution; Need ultrasonic
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (10.82 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Scopoletin is an inhibitor of acetylcholinesterase (AChE).

IC_{50} & Target

AChE

In Vitro

Scopoletin (SCT) is identified as a putative inhibitor of acetylcholinesterase (AChE). Scopoletin enhances the K^+-stimulated release of ACh from rat frontal cortex synaptosomes, showing a bell-shaped dose effect curve (E_{max}: 4 μM) [1]. Scopoletin

	inhibits PC3 proliferation by inducing apoptosis of PC3 cells. The IC_{50} of Scopoletin for inhibiting PC3, PAA (human lung cancer cell), and Hela cell proliferation is (157±25), (154±51), and (294±100) mg/L, respectively. Scopoletin induces a marked time- and concentration-dependent inhibition of PC3 cell proliferation. Scopoletin reduces the protein content and decreases the acid phosphatase activity (ACP) level in PC3 cells in a concentration-dependent manner. Cells treated by Scopoletin show typical morphologic changes of apoptosis by light microscope, fluorescence microscope, and transmission electronmicroscope. Apoptosis rate is 0.3 %, 2.1 %, 9.3 % and 35 % for Scopoletin 0, 100, 200, and 400 mg/L, respectively, and cells in G2 phase decrease markedly after being treated with Scopoletin[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Scopoletin (2 μg, i.c.v.) increases T-maze alternation and ameliorated novel object recognition of mice with scopolamine-induced cholinergic deficit. It also reduces age-associated deficits in object memory of 15-18-month-old mice (2 mg/kg sc). Mice injected with 2 μg Scopoletin show an increased alternation rate of 71.3±2.5%[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [2]	PC3 cells (5×10^7/L) 1 mL in exponential growth are seeded into four 24-well plates. The plates are incubated at 37°C in a humidified 5% CO_2 atmospbee. After 24h, Scopoletin 33, 66, 133, 266, and 533 mg/L are added to wells (3 wells for each concentration for each plate). For control cells (3 wells foreach plate),only DMEM was added. The plates are incubated continually. The viable cells are counted by hemocytometer every day in the frist 4 d by Trypan blue dye exclusion method [2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [1]	Mice[1] C56BL/6N male, 4-6-month-old and 16-18-month-old mice are used in the behavioral studies. The mice are housed in groups of four in cages at constant humidity (50-55%) and temperature (22±1°C) on a 12:12 h light/dark cycle (7:00–19:00 h), with food and water ad libitum. Younger mice (4-6 months) are implanted with i.c.v. cannulas for application of Scopolamine (SCOP) and Scopoletin. The aged mice are injected with Scopoletin by the s.c. route. Experiments are conducted between 8:00 and 16:00 h. Mice with i.c.v. cannulas are randomly divided into four experimental groups: vehicle; SCOP 20 μg; Scopoletin 2 μg; and SCOP 20 μg plus Scopoletin 2 μg. The drugs are applied in 1 μL of vehicle solution (SCOP: saline, Scopoletin: 3 DMSO: 7 sterile water). I.c.v. injections are carried out 15 min before the start of the tests. Aged mice obtained Scopoletin s.c. 30 min prior to object memory test (vehicle: 1 DMSO: 1 EtOH, diluted with olive oil as required)[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Phytopathology Research. 2024 Jan 2.
- Oxid Med Cell Longev. 2019 May 2;2019:2761041

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REFERENCES

[1]. Hornick A, et al. The coumarin Scopoletin potentiates acetylcholine release from synaptosomes, amplifies hippocampal long-term potentiation and ameliorates anticholinergic- and age-impaired memory. Neuroscience. 2011 Dec 1;197:280-92.

[2]. Liu XL, et al. Effect of Scopoletin on PC3 cell proliferation and apoptosis. Acta Pharmacol Sin. 2001 Oct;22(10):929-33.

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

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