p-Coumaric acid

Cat. No.: HY-N0351

CAS No.: 501-98-4

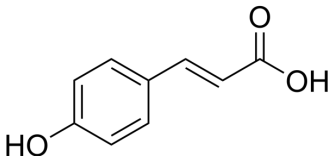
Molecular Formula: $C_9H_8O_3$

Molecular Weight: 164.16

Target: Endogenous Metabolite; Bacterial; Apoptosis

Pathway: Metabolic Enzyme/Protease; Anti-infection; Apoptosis

Storage: 4°C, stored under nitrogen
* In solvent : -80°C, 6 months; -20°C, 1 month (stored under nitrogen)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 25 mg/mL (152.29 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	6.0916 mL	30.4581 mL	60.9162 mL
	5 mM	1.2183 mL	6.0916 mL	12.1832 mL
	10 mM	0.6092 mL	3.0458 mL	6.0916 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 (12.67 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (12.67 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (12.67 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

p-Coumaric acid (trans-4-Hydroxycinnamic acid) is an isomer of cinnamic acid with oral activity. p-Coumaric acid inhibits cell proliferation and promotes apoptosis. p-Coumaric acid has antibacterial, anti-inflammatory, antioxidant and anti-tumor activities[1][2][3][4].

IC_{50} & Target

Microbial Metabolite | Human Endogenous Metabolite

In Vitro

p-Coumaric acid (1 or 3 μg/mL, 24, 48, 72 h) can significantly inhibit the proliferation of human and mouse melanoma cells in vitro and promote cell apoptosis[1].
p-Coumaric acid (10-80 μg/mL) shows antibacterial activity against both gram-negative and Gram-positive bacteria, and MIC

values for Escherichia coli, Streptococcus dysenteriae and Salmonella typhimurium are 80, 10 and 20 μg/ml[2].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Proliferation Assay[1]

Cell Line:	A375, B16
Concentration:	1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5 mM
Incubation Time:	24, 48 h
Result:	Inhibited the proliferation of A375 and B16 cells The IC_{50} values on A375 cells were 4.4 mM and 2.5 mM , and the IC_{50} values on B16 cells were 4.1 mM and 2.8 mM in 24 and 48 h, respectively.

Cell Cycle Analysis[1]

Cell Line:	A375, B16
Concentration:	1.5, 2.5, 3 mM;2, 3, 4 mM
Incubation Time:	24 h
Result:	Increased the S phase proportion in A375 cells and the G0/G1 phase proportion in B16 cells.

Western Blot Analysis[1]

Cell Line:	A375, B16
Concentration:	1.5, 2.5, 3 mM;2, 3, 4 mM
Incubation Time:	24 h
Result:	Reduced the expression levels of CDK2 and Cyclin A in A375 cells and the levels of CDK2 and Cyclin E in B16 cells. Decreased the levels of caspase-3 and caspase-9 and increased the levels of cleaved caspase-3 and cleaved caspase-9. Downregulated Bcl-2 and upregulated Bax, Apaf1, and cytoplasmic Cyto-C levels.

In Vivo

p-Coumaric acid (50, 100, 200 mg/kg, suspended in 0.5% carboxymethyl cellulose (CMC), was administered daily via gastric cannula for 15 weeks) It has a protective effect on colon pretumor induced by 1,2 dimethylhydrazine (DMH) in rats[3].

p-Coumaric acid (15, 100 mg/kg, oral) alleviates nephrotoxicity induced by Doxorubicin (HY-15142A) in rats by inhibiting oxidative stress, inflammation and apoptosis[4].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	DMH-induced colonic preneoplastic lesions in rats[3]
Dosage:	50, 100, 200 mg/kg
Administration:	suspended in 0.5% carboxymethylcellulose (CMC) and administered every day via intragastric intubation
Result:	Reduced the polyp incidence to 71.42%, 57.14% and 42.85% respectively. Reduced the ACF and DACF in a dose-dependent manner and the β– catenin immune activity. Decreased levels of TBARS and increased levels of SOD, CAT and GPx.

	Decreased the activity of β-glucuronidase, and mucinase.
Animal Model:	Doxorubicin-induced nephrotoxicity rats[4]
Dosage:	15, 100 mg/kg
Administration:	p.o.
Result:	Decreased serum creatinine, BUN and lipid peroxidation, IL-1β and TNF-α. Decreased the number of TUNEL-positive cells.

CUSTOMER VALIDATION

- Food Chem. 2022: 134807.

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REFERENCES

[1]. Hu X, et al. The Anti-tumor Effects of p-Coumaric Acid on Melanoma A375 and B16 Cells. Front Oncol. 2020 Oct 16;10:558414.

[2]. NLou Z, et al. p-Coumaric acid kills bacteria through dual damage mechanisms. Food control, 2012, 25(2): 550-554..

[3]. Sharma SH, et al. Protective effect of p-coumaric acid against 1,2 dimethylhydrazine induced colonic preneoplastic lesions in experimental rats. Biomed Pharmacother. 2017 Oct;94:577-588.

[4]. Rafiee Z, et al Doxorubicin-Induced Nephrotoxicity Through Suppression of Oxidative Stress, Inflammation and Apoptosis. Arch Med Res. 2020 Jan;51(1):32-40.

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