Cryptochlorogenic acid

Cat. No.: HY-N0787

CAS No.: 905-99-7

Molecular Formula: $C_{16}H_{18}O_9$

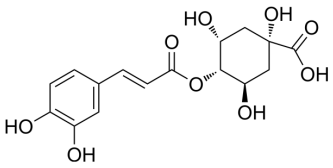
Molecular Weight: 354.31

Target: Endogenous Metabolite; NF-κB; Keap1-Nrf2; mTOR; HIF/HIF Prolyl-Hydroxylase

Pathway: Metabolic Enzyme/Protease; NF-κB; PI3K/Akt/mTOR

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 : 50 mg/mL (141.12 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	2.8224 mL	14.1119 mL	28.2239 mL
5 mM	0.5645 mL	2.8224 mL	5.6448 mL
10 mM	0.2822 mL	1.4112 mL	2.8224 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: ≥ 2.5 mg/mL (7.06 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: 2.5 mg/mL (7.06 mM); Suspended solution; Need ultrasonic
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (7.06 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Cryptochlorogenic acid (4-Caffeoylquinic acid) is a naturally occurring phenolic acid compound with oral effectiveness, anti-inflammatory, antioxidant and anti-cardiac hypertrophy effects. Alleviating LPS (HY-D1056) and ISO (HY-B0468) by regulating proinflammatory factor expression, inhibiting NF-κB activity, promoting Nrf2 nuclear transfer, and regulating PI3Kα/Akt/ mTOR / HIF-1α signaling pathway Induced physiological stress response[1][2][3].

IC_{50} & Target

HIF-1α

In Vitro

Cryptochlorogenic acid (0-150 μM, 12, 24 or 48 h) shows low toxicity to RAW264.7 cells and does not significantly affect the viability of RAW264.7 cells at specific concentrations[2].
Cryptochlorogenic acid (20-80 μM, 2 h) can dose-dependent inhibit lipopolysaccharide (LPS: 1 μg/mL, 24 h) in RAW264.7 cells. induced the production of nitric oxide (NO), tumor necrosis factor-α (TNF-α) and interleukin-6 (IL-6), blocking the expression of iNOS, COX-2, TNF-α and IL-6[2].
Cryptochlorogenic acid (20-80 μM, 2 hours) inhibits the phosphorylation of IκB kinase (IKK), degrades I-κB, and reduces the nuclear translocation of NF-κB. At the same time, CCGA downregulates the phosphorylation level of MAPKs. Overall, CCGA effectively controls the expression of pro-inflammatory factors, thereby alleviating LPS-induced (1 μg/mL, 24 h) inflammation. It also promotes the nuclear translocation of Nrf2 to inhibit oxidative stress[2].
Cryptochlorogenic acid (1-200 μM, 48 hours) can effectively reduce the myocardial hypertrophy of H9c2 cells caused by ISO at a certain concentration. Cryptochlorogenic acid regulates the PI3Kα/Akt/mTOR/HIF-1α signaling pathway by significantly inhibiting the phosphorylation expression level of mTOR and over-expression of p-Akt and HIF-1α induced by ISO[3].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Western Blot Analysis[2]

Cell Line:	RAW264.7 cells
Concentration:	Cryptochlorogenic acid: 20-80 μM, LPS: 1 μg/mL
Incubation Time:	Cryptochlorogenic acid: 2 h, LPS: 24 h
Result:	Significantly inhibited the protein levels of iNOS, COX-2, IL-6, TNF-α and TLR4 in RAW264.7 macrophages stimulated by LPS. Significantly inhibited the phosphorylation and degradation of IκB and the phosphorylation of IKKα/β induced by LPS. Dose-dependent reduction of LPS-induced NF-κB(p65) transfer from cytoplasm to nucleus. Significantly inhibited the phosphorylation of JNK1/2, ERK1/2, and p38 proteins induced by LPS. significantly up-regulated Nrf2 protein levels in the nucleus and decreased NRF2 protein levels in the cytoplasm in a dose-dependent manner.

Cell Viability Assay[2]

Cell Line:	RAW264.7 cells
Concentration:	Cryptochlorogenic acid (CCGA) : 0-150 μM, LPS (HY-D1056) : 0-3 μg/ml
Incubation Time:	12, 24 or 48 h
Result:	At doses of 150 μM and 100 μM, slight toxicity was shown to RAW264.7 cells with no significant decrease in cell viability. RAW264.7 cells showed no toxicity after being treated with LPS at different concentrations for 12 hours. After being treated with LPS above 2 μg/ml for 24h, the cell viability decreased significantly. Treated with 0-100 μM CCGA and 1 μg/ml LPS for 24 h, RAW264.7 cells had low toxicity and no significant effect on cell viability.

RT-PCR[3]

Cell Line:	H9c2 Cells
Concentration:	1-200 μM
Incubation Time:	48 h
Result:	Significantly decreased the expression levels of ANP, BNP and HIF-1α mRNA in H9c2 cells after ISO treatment.

In Vivo

Pharmacokinetic parameters of Cryptochlorogenic acid after intragastric administration of Cryptochlorogenic acid at three dosages[2]

Dose (mg/kg)	C_{max} (μg/L)	t_{max} (h)	$t_{1/2}$ (h)	AUC_{0-t} (μg•h/L)	$AUC_{0-\infty}$ (μg•h/L)	MRT_{0-t} (h)	$MRT_{0-\infty}$ (h)
100	630	0.33	2.00	1938.91	1977.70	3.21	3.51
200	1270.09	0.47	1.97	3071.87	3179.41	3.23	3.39
400	2582.68	0.44	2.34	8825.32	9139.54	3.47	3.93

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

CUSTOMER VALIDATION

- Lwt-Food Sci Technol. December 2021, 112343.

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REFERENCES

[1]. Zhao XL, et al. Cryptochlorogenic acid attenuates LPS-induced inflammatory response and oxidative stress via upregulation of the Nrf2/HO-1 signaling pathway in RAW 264.7 macrophages. Int Immunopharmacol. 2020;83:106436.

[2]. Li J, et al. Cryptochlorogenic acid and its metabolites ameliorate myocardial hypertrophy through a HIF1α-related pathway. Food Funct. 2022;13(4):2269-2282. Published 2022 Feb 21.

[3]. Wang Jing, ea al.Simultaneous determination of chlorogenic acid,cryptochlorogenic acid,caffeic acid,naringin,hesperidin and linarin in Xiao'erjinning oral liquid by an HPLC method. China Journal of Chinese Materia Medica, 2010-13

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