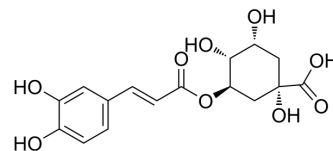


## Chlorogenic acid

<b>Cat. No.:</b>	HY-N0055												
<b>CAS No.:</b>	327-97-9												
<b>Molecular Formula:</b>	C <sub>16</sub> H <sub>18</sub> O <sub>9</sub>												
<b>Molecular Weight:</b>	354.31												
<b>Target:</b>	HIF/HIF Prolyl-Hydroxylase; Reactive Oxygen Species; Bacterial; Influenza Virus; Endogenous Metabolite												
<b>Pathway:</b>	Metabolic Enzyme/Protease; Immunology/Inflammation; NF-κB; Anti-infection												
<b>Storage:</b>	<table border="0"> <tr> <td>Powder</td> <td>-20°C</td> <td>3 years</td> </tr> <tr> <td></td> <td>4°C</td> <td>2 years</td> </tr> <tr> <td>In solvent</td> <td>-80°C</td> <td>1 year</td> </tr> <tr> <td></td> <td>-20°C</td> <td>6 months</td> </tr> </table>	Powder	-20°C	3 years		4°C	2 years	In solvent	-80°C	1 year		-20°C	6 months
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### SOLVENT & SOLUBILITY

#### In Vitro

DMSO : 100 mg/mL (282.24 mM; Need ultrasonic)  
 H<sub>2</sub>O : ≥ 20 mg/mL (56.45 mM)  
 \* "≥" means soluble, but saturation unknown.

Concentration	Mass		
	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

- 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
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)  
Solubility: ≥ 2.5 mg/mL (7.06 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil  
Solubility: ≥ 2.5 mg/mL (7.06 mM); Clear solution

### BIOLOGICAL ACTIVITY

#### Description

Chlorogenic acid is a major phenolic compound in *Lonicera japonica* Thunb. It is an orally active antioxidant activity, antibacterial, hepatoprotective, cardioprotective, anti-inflammatory, antipyretic, neuroprotective, anti-obesity, antiviral, anti-microbial, anti-hypertension compound<sup>[1][2][3]</sup>.

<p><b>In Vitro</b></p>	<p>Chlorogenic acid (10 <math>\mu</math>M, 16 h) decreases HIF-1<math>\alpha</math> protein levels in CoCl<sub>2</sub> induced hypoxic A549 cells, but does not affect HIF-1 <math>\alpha</math> mRNA level<sup>[1]</sup>.</p> <p>Chlorogenic acid (10 <math>\mu</math>M, 24 h) inhibits the hypoxia-induced HUVEC cell migration, invasion and tube formation of vascular endothelial cells<sup>[1]</sup>.</p> <p>Chlorogenic acid (25, 50 <math>\mu</math>M, 24 h) inhibits cell proliferation of Huh7 cells, and reduces the number of invading and migrating cells<sup>[4]</sup>.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>																
<p><b>In Vivo</b></p>	<p>Chlorogenic acid (10 <math>\mu</math>M, s.c.) inhibits VEGF (200 ng/mL)-induced angiogenesis in C57BL/6J mice, by suppression of AKT activation (Matrigel plug assay)<sup>[1]</sup>.</p> <p>Chlorogenic acid (10-100 mg/kg, p.o.) shows protective effects against experimental reflux esophagitis in rats<sup>[3]</sup>.</p> <p>Chlorogenic acid (10 mg/kg, i.v.) prevents endotoxic mortality and induced TNF-<math>\alpha</math> release of LPS-intoxicated C57BL/6 mice, and ameliorates acute liver injury of LPS/GalN-challenged mice<sup>[2]</sup>.</p> <p>Chlorogenic acid (ip, 25-200 mg/kg) inhibits tumor growth in NOD/SCID mice inoculated with Huh7 or H446 cells<sup>[4]</sup>.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p> <table border="1" data-bbox="347 659 1515 1346"> <tbody> <tr> <td data-bbox="347 659 618 722">Animal Model:</td> <td data-bbox="618 659 1515 722">Experimental reflux esophagitis (RE) in rats<sup>[1]</sup></td> </tr> <tr> <td data-bbox="347 722 618 785">Dosage:</td> <td data-bbox="618 722 1515 785">10, 30, 100 mg/kg</td> </tr> <tr> <td data-bbox="347 785 618 848">Administration:</td> <td data-bbox="618 785 1515 848">p.o.</td> </tr> <tr> <td data-bbox="347 848 618 995">Result:</td> <td data-bbox="618 848 1515 995"> <p>Reduced esophageal lipid peroxidation (marker: MDA) and increased the reduced glutathione/oxidized glutathione ratio.</p> <p>Inhibited the increases in the serum level of TNF-<math>\alpha</math>, and expressions of iNOS and COX-2 protein.</p> </td> </tr> <tr> <td data-bbox="347 1037 618 1100">Animal Model:</td> <td data-bbox="618 1037 1515 1100">LPS/GalN-challenged mice<sup>[2]</sup></td> </tr> <tr> <td data-bbox="347 1100 618 1163">Dosage:</td> <td data-bbox="618 1100 1515 1163">10 mg/kg</td> </tr> <tr> <td data-bbox="347 1163 618 1226">Administration:</td> <td data-bbox="618 1163 1515 1226">i.v.</td> </tr> <tr> <td data-bbox="347 1226 618 1346">Result:</td> <td data-bbox="618 1226 1515 1346"> <p>Increased survival rates of LPS/GalN-intoxicated mice.</p> <p>Inhibited LPS/GalN-induced phosphorylation of NF-<math>\kappa</math>B p65 or c-Jun, without affecting p-IRF3 levels in the liver lobules.</p> </td> </tr> </tbody> </table>	Animal Model:	Experimental reflux esophagitis (RE) in rats <sup>[1]</sup>	Dosage:	10, 30, 100 mg/kg	Administration:	p.o.	Result:	<p>Reduced esophageal lipid peroxidation (marker: MDA) and increased the reduced glutathione/oxidized glutathione ratio.</p> <p>Inhibited the increases in the serum level of TNF-<math>\alpha</math>, and expressions of iNOS and COX-2 protein.</p>	Animal Model:	LPS/GalN-challenged mice <sup>[2]</sup>	Dosage:	10 mg/kg	Administration:	i.v.	Result:	<p>Increased survival rates of LPS/GalN-intoxicated mice.</p> <p>Inhibited LPS/GalN-induced phosphorylation of NF-<math>\kappa</math>B p65 or c-Jun, without affecting p-IRF3 levels in the liver lobules.</p>
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## CUSTOMER VALIDATION

- Food Chem. 2017 Aug 1;228:143-151.
- Int J Biol Macromol. 2019 Sep 1;136:804-812.
- Phytother Res. 2022 Feb 8.
- J Agric Food Chem. 2020 Jul 29;68(30):8050-8056.
- Life Sci. 2020 Aug 1;254:117590.

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## REFERENCES

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- [1]. Huang S, et al. Chlorogenic acid effectively treats cancers through induction of cancer cell differentiation. *Theranostics*. 2019 Sep 19;9(23):6745-6763.
- [2]. Park JJ, et al. Chlorogenic acid inhibits hypoxia-induced angiogenesis via down-regulation of the HIF-1 $\alpha$ /AKT pathway. *Cell Oncol (Dordr)*. 2015 Jan 6.
- [3]. Park SH, et al. IRAK4 as a Molecular Target in the Amelioration of Innate Immunity-Related Endotoxic Shock and Acute Liver Injury by Chlorogenic Acid. *J Immunol*. 2015 Feb 1;194(3):1122-30.
- [4]. Kang JW, et al. Protective Effects of Chlorogenic Acid against Experimental Reflux Esophagitis in Rats. *Biomol Ther (Seoul)*. 2014 Sep;22(5):420-5.
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