Eugenol

Cat. No.: HY-N0337

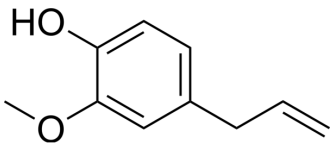
CAS No.: 97-53-0

Molecular Formula: $C_{10}H_{12}O_2$

Molecular Weight: 164.2

Target: Bacterial; Parasite; Reactive Oxygen Species; Apoptosis; Ferroptosis

Pathway: Anti-infection; Immunology/Inflammation; Metabolic Enzyme/Protease; NF-κB; Apoptosis



Storage:

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

SOLVENT & SOLUBILITY

In Vitro

DMSO : ≥ 100 mg/mL (609.01 mM)

* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	6.0901 mL	30.4507 mL	60.9013 mL
5 mM	1.2180 mL	6.0901 mL	12.1803 mL
10 mM	0.6090 mL	3.0451 mL	6.0901 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: ≥ 3.25 mg/mL (19.79 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 3.25 mg/mL (19.79 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 3.25 mg/mL (19.79 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Eugenol is an essential oil found in cloves with antibacterial, anthelmintic and antioxidant activity. Eugenol is shown to inhibit lipid peroxidation.

IC_{50} & Target

Bacterial, Parasite[1]

In Vitro	The essential oil of O. gratissimum, as well as eugenol, are efficient in inhibiting eclodibility of H. contortus eggs, showing possible utilizations in the treatment of gastrointestinal helmintosis of small ruminants. At 0.50% concentration, the essential oil and eugenol show a maximum eclodibility inhibition[1]. Eugenol inhibits superoxide anion generation in xanthine-xanthine oxidase system to an extent of 50% at concentrations of 250 μM. Eugenol also inhibits the generation of hydroxyl radicals to an extent of 70%. The OH-radical formation measured by the hydroxylation of salicylate to 2, 3-dihydroxy benzoate is inhibited to an extent of 46% by eugenol at 250 μM[2]. Eugenol protects against RS-induced development of IBS-like gastrointestinal dysfunction through modulation of HPA-axis and brain monoaminergic pathways apart from its antioxidant effect. Eugenol (50 mg/kg) reduces 80% of RS-induced increase in fecal pellets similar to that of ondansetron. Eugenol attenuates 80% of stress-induced increase in plasma corticosterone and modulates the serotonergic system in the PFC and amygdala. Eugenol attenuates stress-induced changes in norepinephrine and potentiates the antioxidant defense system in all brain regions[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Eugenol (33 mg/kg) administered orally for 2 days causes significant suppression of knee joint edema, which continues to be significantly reduced at the end of the treatment. After 2 days, eugenol-treated mycobacterial arthritic rats show a marked reduction in paw swelling[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [1]	The essential oil and eugenol are diluted in aqueous solution of Tween 20 (0.5%) in the following concentrations: 0.0625, 0.12, 0.25, 0.5 and 1.0% to be used in the egg hatch test[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [4]	Rats: The treatment groups of arthritic rats are given either ingwerol (0.33 mL/kg or 33 mg/kg) or eugenol (0.33 mL/kg or 33 mg/kg) orally 1 day prior to the induction of arthritis. This treatment is continued for 26 days on a daily basis. Mycobaterium trated rats receive physiological saline orally[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Autophagy. 2022 Oct 27.
- Int J Mol Sci. 2024 Feb 8;25(4):2098.
- Eur J Pharmacol. 2022 Jun 5;924:174955.
- Microbiol Spectr. 2023 Sep 14;e0366622.
- bioRxiv. 2024 Mar 11.

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REFERENCES

[1]. Pessoa LM, et al. Anthelmintic activity of essential oil of Ocimum gratissimum Linn. and eugenol against Haemonchus contortus. Vet Parasitol. 2002 Oct 16;109(1-2):59-63.

[2]. Reddy AC, et al. Studies on the inhibitory effects of curcumin and eugenol on the formation of reactive oxygenspecies and the oxidation of ferrous iron. Mol Cell Biochem. 1994 Aug 17;137(1):1-8.

[3]. Garabadu D, et al. Protective effect of eugenol against restraint stress-induced gastrointestinal dysfunction: Potential use in irritable bowel syndrome. Pharm Biol. 2015

Jul;53(7):968-74.

[4]. Sharma JN, et al. Suppressive effects of eugenol and ginger oil on arthritic rats. Pharmacology. 1994 Nov;49(5):314-8.

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