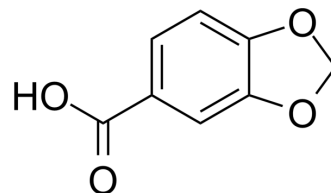


Piperonylic acid

Cat. No.:	HY-41404												
CAS No.:	94-53-1												
Molecular Formula:	C ₈ H ₆ O ₄												
Molecular Weight:	166.13												
Target:	Cytochrome P450; Interleukin Related; EGFR; IGF-1R												
Pathway:	Metabolic Enzyme/Protease; Immunology/Inflammation; JAK/STAT Signaling; Protein Tyrosine Kinase/RTK												
Storage:	<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>6 months</td> </tr> <tr> <td></td> <td>-20°C</td> <td>1 month</td> </tr> </table>	Powder	-20°C	3 years		4°C	2 years	In solvent	-80°C	6 months		-20°C	1 month
Powder	-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 (601.94 mM; Need ultrasonic)				
		Solvent Concentration	Mass		
	Preparing Stock Solutions		1 mg	5 mg	10 mg
		1 mM	6.0194 mL	30.0969 mL	60.1938 mL
		5 mM	1.2039 mL	6.0194 mL	12.0388 mL
10 mM		0.6019 mL	3.0097 mL	6.0194 mL	
Please refer to the solubility information to select the appropriate solvent.					
In Vivo	<ol style="list-style-type: none"> Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline Solubility: ≥ 2.5 mg/mL (15.05 mM); Clear solution Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline) Solubility: 2.5 mg/mL (15.05 mM); Suspended solution; Need ultrasonic Add each solvent one by one: 10% DMSO >> 90% corn oil Solubility: ≥ 2.5 mg/mL (15.05 mM); Clear solution 				

BIOLOGICAL ACTIVITY

Description	Piperonylic acid is a natural molecule bearing a methylenedioxy function that closely mimics the structure of trans-cinnamic acid. Piperonylic Acid is a selective, mechanism-based inactivator of the trans-cinnamate 4-Hydroxylase. Piperonylic acid has anticancer, antioxidant and antibacterial activities ^{[1][2][3][4]} .			
IC₅₀ & Target	IL-6	IL-10	EGFR	MCP-1
	IGF-1			

In Vitro	<p>Piperonylic acid (10 mg/mL, 24 h) has inhibitory effects on both gram-negative and gram-positive bacteria, of which <i>S. epidermidis</i> is the most sensitive with the MIC value is 78.12 mg/ml^[3].</p> <p>Piperonylic acid (50/100 µM, 24 h) ultimately promotes the growth and survival of HaCaT cells and restores cell viability after UV-induced cell damage by activating the EGFR signaling pathway^[2].</p> <p>Piperonylic acid (20-300 µg/mL, 60 min) has antioxidant activity and inhibits the oxidation of β-Carotene (HY-N0411) ^[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p> <p>Western Blot Analysis ^[2]</p>	
	Cell Line:	HaCaT cells
	Concentration:	100 µM
	Incubation Time:	10 min
	Result:	<p>Promoted EGFR tyrosine phosphorylation.</p> <p>Piperonylic acid-induced EGFR activation resulted in activation of ERK and AKT.</p> <p>Increased gene expression involved in cell growth and survival, such as c-Myc, c-Fos, and EGR-1.</p>
In Vivo	<p>Piperonylic acid (20 µL of 10 µM per day, applied topically to wounds) accelerates wound healing in mice by modulating inflammation and collagen deposition^[4].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>	
	Animal Model:	4 weeks male C57BL6/J mice ^[4]
	Dosage:	20 µL of 10 µM per day until the wound heals completely
	Administration:	applied topically to wounds
	Result:	<p>Positively modulated EGFR expression in epidermal cells.</p> <p>Promoted the increase of IL-10, IL-6, MCP-1 and IGF-1 expression.</p>

REFERENCES

- [1]. Lee D, et al. Piperonylic acid stimulates keratinocyte growth and survival by activating epidermal growth factor receptor (EGFR). *Sci Rep.* 2018 Jan 9;8(1):162.
- [2]. Zarai, Zied, et al. "Antioxidant and antimicrobial activities of various solvent extracts, piperine and piperic acid from *Piper nigrum*." *Lwt-Food science and technology* 50.2 (2013): 634-641.
- [3]. Moreira KG, et al. Accelerative action of topical piperonylic acid on mice full thickness wound by modulating inflammation and collagen deposition. *PLoS One.* 2021 Oct 26;16(10):e0259134.
- [4]. Schalk M, et al, Werck-Reichhart D. Piperonylic acid, a selective, mechanism-based inactivator of the trans-cinnamate 4-hydroxylase: A new tool to control the flux of metabolites in the phenylpropanoid pathway. *Plant Physiol.* 1998;118(1):209-218.

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

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