Product Data Sheet

Product Name: Worenine
Cat. No.: GC39072

Chemical Properties

Cas. No.	38763-29-0		
SMILES	CC1=C2C(C=C3OCOC3=C2)=C[N+]4=C1C(C(CC4)=C5)=CC6=C5OCO6		
Formula	$C_{20}H_{16}NO_4$	M.Wt	334.34
Solubility	Soluble in DMSO	Storage	Store at -20°C,protect from light
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure	Worenine		

Protocol

Cell experiment [1]:

Cell lines	HCT116 and SW620 human colorectal cancer cell lines, and FHC normal human colon cell line
Preparation Method	HCT116 and SW620 cells were maintained in RPMI 1640 medium supplemented with 10% fetal bovine serum (FBS). FHC cells were maintained in DMEM/F12 medium supplemented with 10% FBS. All cells were incubated at 37°C with 5% CO_2. Cells were treated with Worenine (5–20μM) for 24 to 72 hours.
Reaction Conditions	5–20μM; 24–72h.

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Applications	Worenine significantly inhibited the viability and colony formation of HCT116 and SW620 cells, and induced G2/M phase cell cycle arrest. Worenine also suppressed the Warburg effect, as evidenced by significantly reduced glucose uptake, glucose consumption, and lactate production. Worenine downregulated the expression of key glycolytic enzymes (GLUT3, HK2, PFK-L, PKM2, LDHA) and promoted HIF-1α protein degradation. No significant cytotoxic effect was observed on normal FHC cells.

Animal experiment [2]:

Animal models	ICR mice
Preparation Method	Mice were intraperitoneally administered Worenine (5mg/kg/day) for 15 consecutive days. Blood and liver samples were collected for analysis.
Dosage form	5mg/kg/day; i.p.; for 15 days.
Applications	Worenine administration induced significant hepatotoxicity, evidenced by increased plasma alanine aminotransferase (ALT) and carboxylesterase 1 (CE1) activities. Histopathological evaluation revealed liver abnormalities including fat vacuole infiltration, inflammation, and deep staining of some hepatocytes. Worenine showed significant accumulation in the liver.

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References:
[1] Ji L, Shen W, Zhang F, et al. Worenine reverses the Warburg effect and inhibits colon cancer cell growth by negatively regulating HIF-1α. Cell Mol Biol Lett. 2021 May 18;26(1):19.
[2] Zhang H, Luo J, Yi Y, et al. Organic cation transporter 1 and cytochrome P450s play crucial roles in coptisine- and worenine-induced hepatotoxicity. Drug Metab Dispos. 2025 Sep;53(9):100134.

Background

Worenine is an isoquinoline alkaloid isolated from *Coptis chinensis*[1-2]. Worenine acts as a JNK2 kinase inhibitor to suppress related signaling pathway activation, while also reducing oxidative stress and inflammatory responses by activating the Nrf2 pathway. Worenine can be used in research related to psoriasis and cancer[3-4].

In vitro, Worenine (0-128μM) was used to treat MDA-MB-231 and MDA-MB-468 breast cancer cell lines for 48 hours. Worenine significantly inhibited the expression of the RNF130 protein and induced apoptosis[5]. Worenine (5–20μM) was used to treat HCT116 and SW620 colorectal cancer cell lines for 24–72 hours. Worenine significantly inhibited cancer cell viability and colony formation, induced cell cycle arrest, downregulated the expression of key glycolytic enzymes, and inhibited glucose uptake, consumption, and lactate production[6].

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In vivo, a Balb/c mouse model was topically pretreated with Worenine cream (2mM) 3 hours before the back was irradiated with SUV (100KJ/m²) for 2 hours. Worenine significantly inhibited skin epidermal thickening, edema, and immune cell infiltration, while also reducing IL-6 secretion and JNK phosphorylation levels in the skin[7]. ICR mice were intraperitoneally administered Worenine (5mg/kg/day) for 15 consecutive days. Worenine showed significant accumulation in the liver and induced hepatotoxicity, leading to histopathological changes in the liver including fat vacuole infiltration, inflammation, and deep staining of some hepatocytes[8].

References:

[1] Wang Y, Hu Y, Wu T, et al. Recognition of DNA abasic site nanocavity by fluorophore-switched probe: Suitable for all sequence environments. Spectrochim Acta A Mol Biomol Spectrosc. 2016 Jan 15;153:645-50.
[2] Ishaq AR, Younis T, Lin S, et al. Phosphofructokinase-1 in Cancer: A Promising Target for Diagnosis and Therapy. Recent Pat Anticancer Drug Discov. 2025;20(5):667-680.
[3] Lu H, Huang Y, Ni X, et al. TOPK promotes the development of psoriasis and worenine alleviates psoriasiform dermatitis by inhibiting TOPK activity. J Eur Acad Dermatol Venereol. 2024 May;38(5):851-863.
[4] Yang G, Xu M, Wu M, et al. Worenine enhances the sensitivity of non-small cell lung cancer A549/DDP cells to cisplatin via HIF-1α/BNIP3-mediated mitophagy. Gen Physiol Biophys. 2025 Jul;44(4):317-326.
[5] Hu M, Huang L, Deng H, et al. Single-cell transcriptomics uncover RNF130-mediated TNF-α pathway activation and worenine synergy with paclitaxel in breast cancer. Clin Epigenetics. 2026 Jan 24;18(1):32.
[6] Ji L, Shen W, Zhang F, et al. Worenine reverses the Warburg effect and inhibits colon cancer cell growth by negatively regulating HIF-1α. Cell Mol Biol Lett. 2021 May 18;26(1):19.
[7] Xiao J, Lu H, Ma T, et al. Worenine Prevents Solar Ultraviolet-Induced Sunburn by Inhibiting JNK2. Front Pharmacol. 2022 Jul 22;13:881042.
[8] Zhang H, Luo J, Yi Y, et al. Organic cation transporter 1 and cytochrome P450s play crucial roles in coptisine- and worenine-induced hepatotoxicity. Drug Metab Dispos. 2025 Sep;53(9):100134.

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