Ciclopirox olamine

Cat. No.: HY-B0450A

CAS No.: 41621-49-2

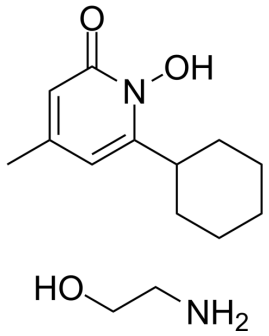
Molecular Formula: $C_{14}H_{24}N_2O_3$

Molecular Weight: 268.35

Target: Fungal; Ferroptosis; Bacterial

Pathway: Anti-infection; Apoptosis

Storage: 4°C, sealed storage, away from moisture
* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 25 mg/mL (93.16 mM; ultrasonic and warming and heat to 60°C)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	3.7265 mL	18.6324 mL	37.2648 mL
	5 mM	0.7453 mL	3.7265 mL	7.4530 mL
	10 mM	0.3726 mL	1.8632 mL	3.7265 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: ≥ 2.08 mg/mL (7.75 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (7.75 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: 2.08 mg/mL (7.75 mM); Clear solution; Need warming

BIOLOGICAL ACTIVITY

Description

Ciclopirox olamine (Ciclopirox ethanolamine) is a synthetic and orally active antifungal agent that can be used for superficial mycoses reseaech. Ciclopirox olamine has a very broad spectrum of activity and inhibits dermatophytes, yeasts, molds, and many Gram-positive and Gram-negative species pathogenic. Ciclopirox olamine also has anticancer and anti-inflammatory effect[1][2][3].

In Vitro

Ciclopirox (10 μM, 18 h) olamine inhibits HUVEC proliferation and angiogenesis[4].
Ciclopirox (0-10 μM, 20 h) olamine inhibits deoxyhypusine hydroxylation in HUVECs[4].
Ciclopirox (0-40 μM, 72 h) olamine shows anti-tumor activity in H1299 and 95D cells (decreases cell viability, with IC_{50}s of 11.13 and 4.136 μM respectively), and inhibits cell migration and invasion[5].

	Ciclopirox (0-40 μM, 48 h) olamine arrests both H1299 and 95D cells in G1 phase, decreases Cyclin D1 and CDK4 protein level in H1299 and 95D cells[5]. Ciclopirox (0-20 μM) olamine induces cell aerobic glycolysis, impairs mitochondrial functions and enhances the generation of ROS in H1299 and 95D cells[5]. Ciclopirox (0-40 μM, 48 h) olamine activates PERK-dependent ER stress in CRC cells (HCT-8, HCT-8/5-FU, and DLD-1 cells)[6]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Ciclopirox (20 mg/kg, i.p.) olamine reduces tumor size in mouse H1299 xenograft model, and reduces tumor cell proliferation (Ki67 staining) and increases apoptosis (Cleaved-Caspase 3 and Tunel staining)[5]. Ciclopirox (25 mg/kg, p.o., daily) olamine also inhibits tumor growth in human breast cancer MDA-MB231 xenografts in mice [6]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Clin Transl Med. 2022 Aug;12(8):e999.
- Pharmacol Res. 7 January 2022, 106046.
- Front Pharmacol. 2021 May 10;12:670224.
- Eur J Pharmacol. 2022 Jul 19;175156.

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REFERENCES

[1]. Leem, S.H., et al., The possible mechanism of action of ciclopirox olamine in the yeast Saccharomyces cerevisiae. Mol Cells, 2003. 15(1): p. 55-61.

[2]. Ratnavel, R.C., R.A. Squire, and G.C. Boorman, Clinical efficacies of shampoos containing ciclopirox olamine (1.5%) and ketoconazole (2.0%) in the treatment of seborrhoeic dermatitis. J Dermatolog Treat, 2007. 18(2): p. 88-96.

[3]. Clement PM, et al. The antifungal drug ciclopirox inhibits deoxyhypusine and proline hydroxylation, endothelial cell growth and angiogenesis in vitro. Int J Cancer. 2002 Aug 1;100(4):491-8.

[4]. Lu J, et al. Ciclopirox targets cellular bioenergetics and activates ER stress to induce apoptosis in non-small cell lung cancer cells. Cell Commun Signal. 2022 Mar 24;20(1):37.

[5]. Zhou H, et al. The antitumor activity of the fungicide ciclopirox. Int J Cancer. 2010 Nov 15;127(10):2467-77.

[6]. Niewerth M, et al. Ciclopirox olamine treatment affects the expression pattern of Candida albicans genes encoding virulence factors, iron metabolism proteins, and drug resistance factors. Antimicrob Agents Chemother. 2003 Jun;47(6):1805-17.

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