Ferrostatin-1

Cat. No.: HY-100579

CAS No.: 347174-05-4

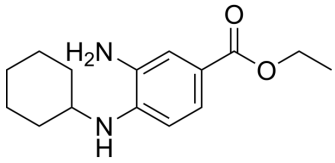
Molecular Formula: $C_{15}H_{22}N_2O_2$

Molecular Weight: 262.35

Target: Ferroptosis; Fungal

Pathway: Apoptosis; Anti-infection

Storage: 4°C, protect from light
* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 125 mg/mL (476.46 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	3.8117 mL	19.0585 mL	38.1170 mL
	5 mM	0.7623 mL	3.8117 mL	7.6234 mL
	10 mM	0.3812 mL	1.9059 mL	3.8117 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 5% DMSO >> 40% PEG300 >> 5% Tween-80 >> 50% saline
   Solubility: 27.78 mg/mL (105.89 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (9.53 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: 2.5 mg/mL (9.53 mM); Suspended solution; Need ultrasonic
4. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (7.93 mM); Clear solution
5. Add each solvent one by one: 10% DMSO >> 90% saline
   Solubility: 0.2 mg/mL (0.76 mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

Ferrostatin-1 (Fer-1), a potent and selective ferroptosis inhibitor, suppresses Erastin-induced ferroptosis in HT-1080 cells (EC_{50}=60 nM). Ferrostatin-1, a synthetic antioxidant, acts via a reductive mechanism to prevent damage to membrane lipids and thereby inhibits cell death. Ferrostatin-1 exhibits antifungal activity[1][2][3].

IC_{50} & Target	EC50: 60 nM (Ferroptosis)[1]
In Vitro	Ferrostatin-1 prevents erastin-induced accumulation of cytosolic and lipid ROS. Ferrostatin-1 prevents glutamate-induced neurotoxicity in organotypic rat brain slices[1]. Ferrostatin-1 (2 μM; 24 h) prevents Glutamate (5 mM)-induced neurotoxicity in a rat organotypic hippocampal slice culture (OHSC)[2]. Ferrostatin-1 inhibits lipid peroxidation, but not mitochondrial reactive oxygen species formation or lysosomal membrane permeability[2]. Ferrostatin-1 inhibits cell death in cellular models of Huntington's disease (HD), periventricular leukomalacia (PVL), and kidney dysfunction[2]. Ferrostatin-1 (1 μM; 6 h) inhibits the oxidative destruction of unsaturated fatty acids in HT-1080 cells, thus increases the number of healthy medium spiny neurons (MSNs)[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Ferrostatin-1 (5 mg/kg; ip; single dose, 30 min before glycerol injection) improves renal function in mice with rhabdomyolysis, whereas no beneficial effects were observed with the pan-caspase inhibitor zVAD or in RIPK3-deficient mice [1]. Ferrostatin-1 (0.8 mg/kg; tail vein injection) effectively alleviates LPS-induced induced acute lung injury (ALI)[4]. Ferrostatin-1 (i.p.; 5 mg/kg; C57BL/6J mice) improves renal function in mice with rhabdomyolysis[5]. Ferrostatin-1 (10 mg/kg/d, i.p., 3 d) attenuates hypoxic-ischemic brain damage-, oxygen-glucose deprivation-, or Erastin (HY-15763)-induced ferroptosis in brain of neonatal rats[6]. Ferrostatin-1 (0.655 mg/kg, i.p., 3 times a week for 6 week) exerts anti-ferroptosis effects by increasing GPX4 activity and by inhibiting lipid peroxidation in the salivary gland of ovariectomized (postmenopausal model) rats[7]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Male C57BL/6 mice (LPS-induced ALI)[4]
Dosage:	0.8 mg/kg
Administration:	Tail vein injection
Result:	Exerted therapeutic action against LPS-induced ALI.

CUSTOMER VALIDATION

- Cell. 2024 Feb 1;187(3):624-641.e23.
- Cell Res. 2023 Jul 17.
- Signal Transduct Target Ther. 2020 May 8;5(1):51.
- Cell Discov. 2022 May 3;8(1):40.
- Adv Mater. 2023 Jun;35(23):e2300548.

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REFERENCES

[1]. Zhang M, et al. Ferrostatin-1 attenuates hypoxic-ischemic brain damage in neonatal rats by inhibiting ferroptosis. Transl Pediatr. 2023 Nov 28;12(11):1944-1970.

[2]. Cheon YI, et al. Effect of deferoxamine and ferrostatin-1 on salivary gland dysfunction in ovariectomized rats. Aging (Albany NY). 2023 Apr 6;15(7):2418-2432.

[3]. Dixon SJ, et al. Ferroptosis: an iron-dependent form of nonapoptotic cell death. Cell. 2012;149(5):1060-1072.

[4]. Skouta R, Dixon SJ, Wang J, et al. Ferrostatins inhibit oxidative lipid damage and cell death in diverse disease models. J Am Chem Soc. 2014;136(12):4551-4556.

[5]. Horwath MC, et al. Antifungal Activity of the Lipophilic Antioxidant Ferrostatin-1. Chembiochem. 2017;18(20):2069-2078.

[6]. Liu P, Feng Y, et al. Ferrostatin-1 alleviates lipopolysaccharide-induced acute lung injury via inhibiting ferroptosis. Cell Mol Biol Lett. 2020;25:10. Published 2020 Feb 27.

[7]. Melania Guerrero Hue, et al. FP282 FERROPTOSIS-MEDIATED CELL DEATH IS DECREASED BY CURCUMIN IN RENAL DAMAGE ASSOCIATED TO RHABDOMYOLYSIS, Nephrology Dialysis Transplantation, Volume 34, Issue Supplement_1, June 2019, gfz106.FP282.

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