Ciprofloxacin lactate

Cat. No.: HY-W040298

CAS No.: 97867-33-9

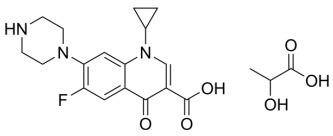
Molecular Formula: $C_{20}H_{24}FN_3O_6$

Molecular Weight: 421.42

Target: Topoisomerase; Apoptosis; Antibiotic; Bacterial; Mitochondrial Metabolism; Reactive Oxygen Species

Pathway: Cell Cycle/DNA Damage; Apoptosis; Anti-infection; Metabolic Enzyme/Protease; Immunology/Inflammation; NF-κB

Storage: Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description

Ciprofloxacin (Bay-09867) lactate is a potent, orally active topoisomerase IV inhibitor. Ciprofloxacin lactate induces mitochondrial DNA and nuclear DNA damage and lead to mitochondrial dysfunction, ROS production. Ciprofloxacin lactate has anti-proliferative activity and induces apoptosis. Ciprofloxacin lactate is a fluoroquinolone antibiotic, exhibiting potent antibacterial activity[1][2][3][4].

IC_{50} & Target

Quinolone

In Vitro

Ciprofloxacin (Bay-09867) lactate (5-50 μg/mL; 0-24 h; tendon cells) inhibits cell proliferation and causes cell cycle arrest at the G2/M phase[1].

Ciprofloxacin (Bay-09867) lactate shows potent activity against Y. pestis and B. anthracis with MIC_{90} of 0.03 μg/mL and 0.12 μg/mL, respectively[2].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Cycle Analysis[1]

Cell Line:	Tendon cells
Concentration:	5, 10, 20 and 50 μg/mL
Incubation Time:	24 hours
Result:	Decreased the cellularity of tendon cells.

Apoptosis Analysis[1]

Cell Line:	Tendon cells
Concentration:	50 μg/mL
Incubation Time:	24 hours
Result:	Arrested cell cycle at the G2/M phase and inhibited cell division in tendon cells.

Western Blot Analysis[1]

Cell Line:	Tendon cells
Concentration:	50 μg/mL
Incubation Time:	0, 6, 12, 17 and 24 hours
Result:	Down-regulated the expression of CDK-1 and cyclin B protein and mRNA. Up-regulated the expression of PLK-1 protein.

In Vivo

Ciprofloxacin (Bay-09867) lactate (30 mg/kg; i.p.; for 24 hours; BALB/c mice) has protection against Y. pestis in murine model of pneumonic plague[3].
Ciprofloxacin (Bay-09867) lactate (100 mg/kg; i.g.; daily, for 4 weeks; C57BL/6J mice) accelerates aortic root enlargement and increases the incidence of aortic dissection and rupture by decreases LOX level and increases MMP levels and activity in the aortic wall[4].
Ciprofloxacin (Bay-09867) lactate (100 mg/kg; i.g.; daily, for 4 weeks; C57BL/6J mice) induces DNA damage and release of DNA to the cytosol, mitochondrial dysfunction, and activation of cytosolic DNA sensor signaling. Ciprofloxacin lactate increases apoptosis and necroptosis in the aortic wall[4].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	BALB/c mice[3]
Dosage:	30 mg/kg
Administration:	Intraperitoneal injection; for 24 hours
Result:	Reduced the lung bacterial load in murine model of pneumonic plague.

Animal Model:	C57BL/6J mice[4]
Dosage:	100 mg/kg
Administration:	Oral gavage; daily, for 4 weeks
Result:	Had aortic destruction that was accompanied by decreased LOX expression and increased MMP expression and activity.

Animal Model:	C57BL/6J mice[4]
Dosage:	100 mg/kg
Administration:	Oral gavage; daily, for 4 weeks
Result:	Caused mitochondrial DNA and nuclear DNA damage, leading to mitochondrial dysfunction and ROS production. Increased apoptosis and necroptosis in the aortic wall.

CUSTOMER VALIDATION

- Adv Sci (Weinh). 2020 Jul 21;7(17):2001374.
- Water Res. 2023 May 21, 120110.
- Genome Biol. 2023 Apr 30;24(1):98.

- EBioMedicine. 2022 Apr;78:103943.
- Int J Antimicrob Agents. 2018 Aug;52(2):269-271.

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REFERENCES

[1]. Tsai WC, et, al. Ciprofloxacin-mediated cell proliferation inhibition and G2/M cell cycle arrest in rat tendon cells. Arthritis Rheum. 2008 Jun;58(6):1657-63.

[2]. Steenbergen J, et, al. In Vitro and In Vivo Activity of Omadacycline against Two Biothreat Pathogens, Bacillus anthracis and Yersinia pestis. Antimicrob Agents Chemother. 2017 Apr 24;61(5):e02434-16.

[3]. Hamblin KA, et, al. Inhaled Liposomal Ciprofloxacin Protects against a Lethal Infection in a Murine Model of Pneumonic Plague. Front Microbiol. 2017 Feb 6;8:91.

[4]. LeMaire SA, et, al. Effect of Ciprofloxacin on Susceptibility to Aortic Dissection and Rupture in Mice. JAMA Surg. 2018 Sep 1;153(9):e181804.

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