Ciprofloxacin

Cat. No.: HY-B0356

CAS No.: 85721-33-1

Molecular Formula: $C_{17}H_{18}FN_3O_3$

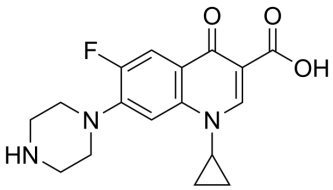
Molecular Weight: 331.34

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

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

Storage: 4°C, protect from light

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



SOLVENT & SOLUBILITY

In Vitro

0.1 M HCL : 16.67 mg/mL (50.31 mM; ultrasonic and warming and adjust pH to 2 with HCl and heat to 60°C)

H_2O : < 0.1 mg/mL (insoluble)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	3.0180 mL	15.0902 mL	30.1805 mL
5 mM	0.6036 mL	3.0180 mL	6.0361 mL
10 mM	0.3018 mL	1.5090 mL	3.0180 mL

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

BIOLOGICAL ACTIVITY

Description

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

IC_{50} & Target

Quinolone

In Vitro

Ciprofloxacin (Bay-09867) (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) 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) (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) (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) (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

- Nat Commun. 2022 Mar 2;13(1):1116.
- 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.

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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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