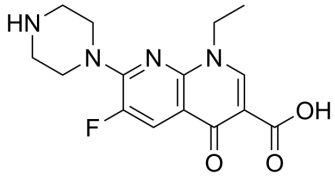
Enoxacin hydrate

Cat. No.:	HY-B0268A
CAS No.:	84294-96-2
Molecular Formula:	$C_{15}H_{17}FN_4O_3 \cdot 3/_2H_2O$
Molecular Weight:	347.34
Target:	Bacterial; Antibiotic; DNA/RNA Synthesis; MicroRNA
Pathway:	Anti-infection; Cell Cycle/DNA Damage; Epigenetics
Storage:	4°C, sealed storage, away from moisture and light * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture and light)



$1.5H_2O$

SOLVENT & SOLUBILITY

In Vitro

1M NaOH : 100 mg/mL (287.90 mM; ultrasonic and adjust pH to 11 with NaOH)
DMSO : 2.78 mg/mL (8.00 mM; Need ultrasonic)
H_2O : < 0.1 mg/mL (insoluble)

Preparing Stock Solutions

Mass / Solvent / Concentration	1 mg	5 mg	10 mg
1 mM	2.8790 mL	14.3951 mL	28.7902 mL
5 mM	0.5758 mL	2.8790 mL	5.7580 mL
10 mM	0.2879 mL	1.4395 mL	2.8790 mL

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

BIOLOGICAL ACTIVITY

Description

Enoxacin hydrate (Enoxacin sesquihydrate), a fluoroquinolone, interferes with DNA replication and inhibits bacterial DNA gyrase (IC_{50}=126 µg/ml) and topoisomerase IV (IC_{50}=26.5 µg/ml). Enoxacin hydrate is a miRNA processing activator and enhances siRNA-mediated mRNA degradation and promotes the biogenesis of endogenous miRNAs. Enoxacin hydrate has potent activities against gram-positive and -negative bacteria. Enoxacin hydrate is a cancer-specific growth inhibitor that acts by enhancing TAR RNA-binding protein 2 (TRBP)-mediated microRNA processing[1][2][3][4].

IC_{50} & Target

Quinolone

In Vitro

Enoxacin hydrate (Enoxacin sesquihydrate) increases siGFP-mediated gene knockdown mediated by siRNA against EGFP in HEK293 cells-based reporter system in a dose-dependent manner, with a median effective concentration (EC50) of ~30 µM, whereas it has no effect on the cells expressing GFP only. Enoxacin (50 µM) promotes the processing of miRNAs and the loading of siRNA duplexes onto RISCs in HEK293 cells[3].
Enoxacin has no effect on the processing of pre-let-7 or pre-miR-30a by Dicer alone. However, the addition of Enoxacin can enhance the processing of let-7 or pre-miR-30a by Dicer and TRBP together[3].

	Enoxacin inhibits 90% Escherichia coli, Klebsiella sp., Aeromonas sp., Enterobacter spp., Serratia spp., Proteus mirabilis, and Morganella morganii at less than or equal to 0.8 micrograms/ml[5]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Enoxacin hydrate (Enoxacin sesquihydrate; 100 μM; 2 μl; injected into ear once a day for 3 consecutive days (days 12, 13 and 14)) enhances the the GFP mRNA knockdown efficiency by Lv-siGFP (from 80% to 60%; 40% GFP mRNA level remained), whereas alone has no effect on GFP expression in GFP transgenic line C57BL/6-Tg(ACTB-EGFP)1Osb/J (10 d old) with lentivirus expressing shGFP (Lv-siGFP; injected into ear for 10 days)[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Sci Rep. 2023 Sep 1;13(1):14360.

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REFERENCES

[1]. Chin, N.-X. and H.C. Neu, In vitro activity of enoxacin, a quinolone carboxylic acid, compared with those of norfloxacin, new beta-lactams, aminoglycosides, and trimethoprim. Antimicrobial agents and chemotherapy, 1983. 24(5): p. 754-763.

[2]. Sonia Melo, et al.Small molecule enoxacin is a cancer-specific growth inhibitor that acts by enhancing TAR RNA-binding protein 2-mediated microRNA processing. Proc Natl Acad Sci U S A. 2011 Mar 15;108(11):4394-9.

[3]. M Takei, et al. Target preference of 15 quinolones against Staphylococcus aureus, based on antibacterial activities and target inhibition. Antimicrob Agents Chemother. 2001 Dec;45(12):3544-7.

[4]. Ge Shan, et al. A small molecule enhances RNA interference and promotes microRNA processing. Nat Biotechnol. 2008 Aug;26(8):933-40.

[5]. Rengen Fan, et al. Small molecules with big roles in microRNA chemical biology and microRNA-targeted therapeutics. RNA Biol. 2019 Jun;16(6):707-718.

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