

Product Data Sheet

Product Name: Nalidixic acid

Cat. No.: GC12455

Chemical Properties

Cas. No. 389-08-2

Chemical Name 1-ethyl-7-methyl-4-oxo-1,8-naphthyridine-3-carboxylic acid

SMILES CCN1C=C(C(=O)C2=C1N=C(C=C2)C)C(=O)O

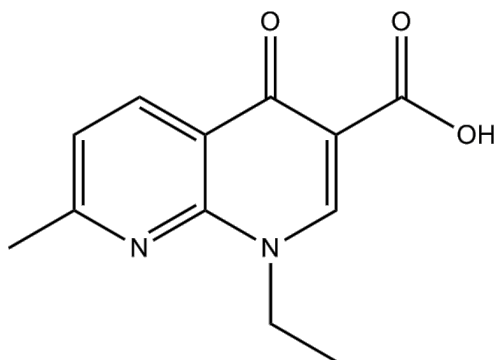
Formula $C_{12}H_{12}N_2O_3$ M.Wt 232.24

Solubility 0.5 M NaOH: 50 mg/ml, Acetonitrile: >1 mg/ml Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Background

Nalidixic acid, the first synthetic and early-generation quinolone antibiotic, is used primarily for treatment of urinary tract infections caused by *Escherichia coli* and a few other Gram negative pathogens. Nalidixic acid reversibly inhibits DNA replication in susceptible Gram-negative bacteria by targeting DNA gyrase, which resolves topological constraints during DNA replication, and DNA topoisomerase IV, which resolves catenated DNA^{[1][2]}.

Caution: Product has not been fully validated for medical applications. For research use only.

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In vitro, Nalidixic acid exhibits potent antibacterial activity against Gram-negative bacteria, including *Escherichia coli*, *Pasteurella spp.*, *Klebsiella pneumoniae*, *Aerobacter aerogenes*, *Proteus spp.*, *Salmonella spp.*, *Shigella spp.*, and *Brucella spp.*, with MIC values ranging from 0.5-32µg/mL, but shows weak activity against the Gram-positive bacteria *Staphylococcus aureus* and *Diplococcus pneumoniae I*, with MIC values of 50-100µg/mL and 250µg/mL, respectively [3].

In vivo, the acute toxicity (LD₅₀) of Nalidixic acid in mice following oral and parenteral administration is: oral, 3300mg/kg; intravenous, 176mg/kg; and subcutaneous, 500mg/kg^[3]. A single oral administration of Nalidixic acid treated systemic infections in mice caused by *Escherichia coli*, *Aerobacter aerogenes*, *Proteus mirabilis*, and *Shigella spp.*, with ED₅₀ values of 25mg/kg, 60mg/kg, 50mg/kg, and 62mg/kg, respectively^[3].

References:

- [1] Bisacchi, Gregory S. "Origins of the Quinolone Class of Antibacterials: An Expanded "Discovery Story"." *Journal of medicinal chemistry* vol. 58,12 (2015): 4874-82.
- [2] Gutierrez A, Stokes JM, Matic I. Our Evolving Understanding of the Mechanism of Quinolones. *Antibiotics* (Basel). 2018;7(2):32.
- [3] LESHER, G Y et al. "1,8-NAPHTHYRIDINE DERIVATIVES. A NEW CLASS OF CHEMOTHERAPEUTIC AGENTS." *Journal of medicinal and pharmaceutical chemistry* vol. 5 (1962): 1063-5.

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