Ofloxacin
PRODUCT DATA SHEET

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Product Name:	Ofloxacin
Product Number:	O001
CAS Number:	82419-36-1
Molecular Formula:	$C_{18}H_{20}FN_3O_4$
Molecular Weight:	361.37
Form:	Powder
Appearance:	White crystalline powder
Solubility:	Glacial Acetic Acid: Soluble Methanol: Slightly Soluble Water:Slightly Soluble
Source:	Synthetic
Melting Point:	250-257°C
Optical Rotation:	-1° to +1°
Storage Conditions:	2-8°C
Description:	Ofloxacin is a synthetic, broad-spectrum, second-generation fluoroquinolone antibiotic. It is an analog of nalidixic acid. Ofloxacin inhibits the supercoiling activity of bacterial DNA gyrase, halting DNA replication. Ofloaxacin was developed by Daiichi Seiyaku to be resistant to metabolic oxidation in the liver. It is used to combat organisms causing urinary tract and respiratory infections.
Mechanism of Action:	Ofloxacin is a Cytochrome P-450 inhibitor and DNA Topoisomerase II inhibitor. Fluoroquinolone antibiotics target bacterial DNA gyrase, an enzyme which reduces DNA strain during replication. Because DNA gyrase is required during DNA replication, subsequent DNA synthesis and ultimately cell division is inhibited.
Spectrum:	Ofloxacin is a broad-spectrum antibiotic targeting a wide range of Gram-positive and Gram-negative organisms.
Microbiology Applications	Ofloxacin is commonly used in clinical *in vitro* microbiological antimicrobial susceptibility tests (panels, discs, and MIC strips) against Gram-positive and Gram-negative microbial isolates. Medical microbiologists use AST results to recommend antibiotic treatment options. Representative MIC values include: ◦ *Haemophilus influenzae* 0.016 µg/mL – 0.063 µg/mL ◦ *Escherichia coli* 0.063 µg/mL – 0.125 µg/mL ◦ For a complete list of Ofloxacin MIC values, click here.

Cancer Applications

Oflaxacin had an inhibitory effect on the proliferation of transitional cell carcinoma cell lines at high concentrations (>200 µg/ml). The effect may be related to impairment of telomerase activity by some unknown mechanism (Yamakuchi M et al, 1997).

Ofloxacin inhibited proliferation and DNA synthesis of these 3 human TCC lines (CCSUP, T24, and J82) *in vitro*. Inhibition occurred in a concentration- and time-dependent manner. Inhibition of proliferation and DNA synthesis were assessed via MTT and tritiated thymidine assays (Seay, 1996).

References:

Mouton Y and Leroy O (1991) Ofloxacin. Int. J. Antimicrob. Agents 1(2-3):57-74

Seay TM, Peretsman SJ and DIxon PS (1996) Inhibition of human transitional cell carcinoma *in vitro* proliferation by fluoroquinolone antibiotics. J. Urol. 2:757-762 PMID 8558720

Smith JT (1991) Ofloxacin, a bactericidal antibacterial. Chemother. 37 (supp 1):2-13 PMID 1646700

Wolfson JS and Hooper DC. (1985) The Fluoroquinolones: Structures, mechanisms of action and resistance, and spectra of activity *in vitro.* Antimicrob. Agents Chemother 28(4): 581-586.

Yamakuchi M, Nakata M, Kawahara K, Kawahara K, Kitajima I and Maruyama I (1997) New quinolones, ofloxacin and levofloxacin, inhibit telomerase activity in transitional cell carcinoma cell lines. Cancer Lett. 119(2):213-219 PMID 9570374