FLOUROQUINOLONES

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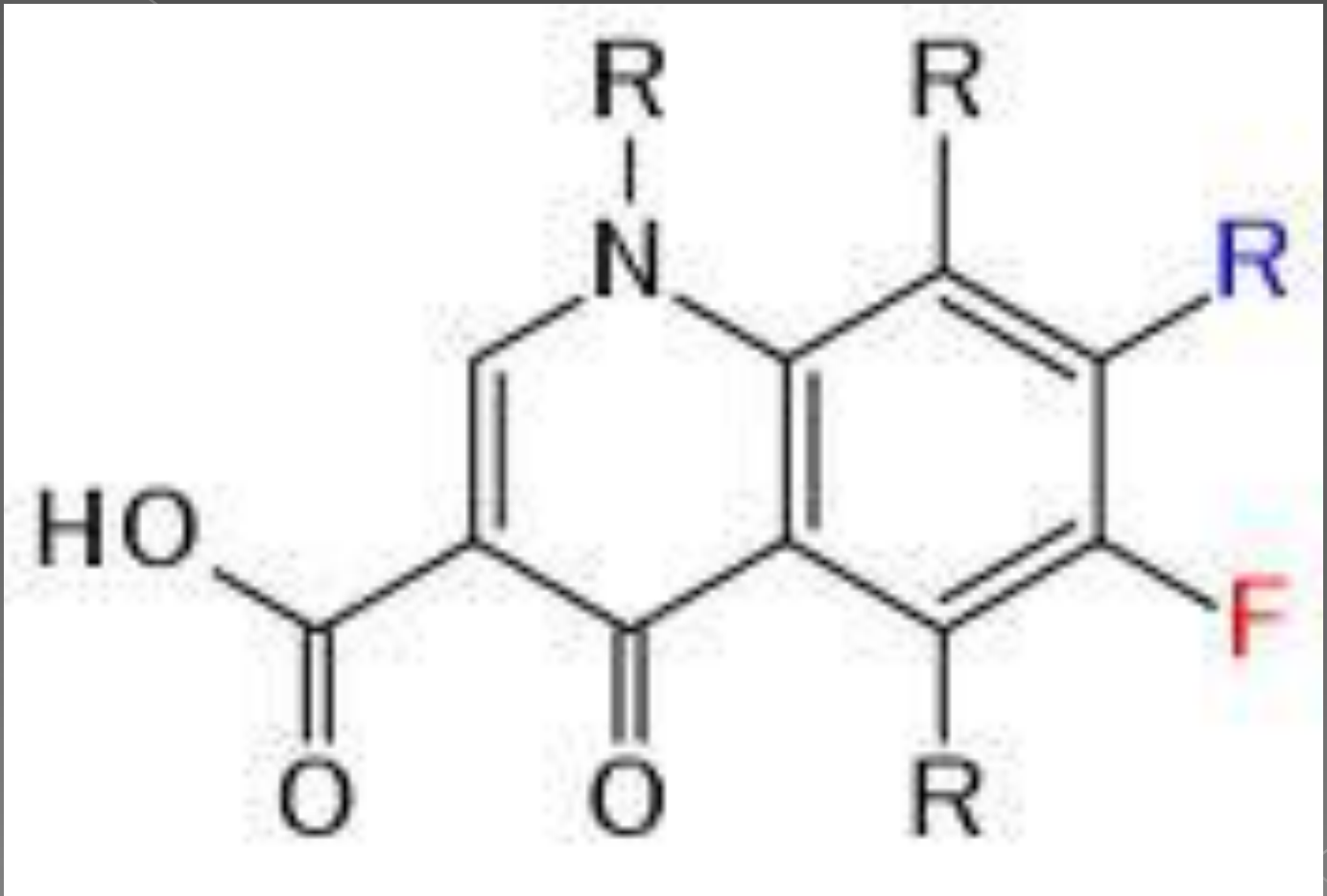
DEFINITION AND properties

- Fluoroquinolones are series of synthetic antibacterial agent having quinolone structure.
- Active against broad rang of aerobic Gram negative and Gram positive bacteria.
- Also active against Pseudomonas,beta lactum and aminoglycoside resistant bacteria.
- Highly potent and rapid bactericidal activity.

STRUCTURE



Structure activity relationship

- Carboxylic group(C3) and ketone group(C4) are essential for microbial activity.
- Introduction of fluorine atom at potion 6 improves potency, efficacy and spectrum of activity against Gram+ bacteria.
- Piperazine ring addition at C6 increases tissue penetration and anti pseudomonas activity.
- Addition of alkyl chain to piperazine ring or nitrogen at position 1 increases lipid solubility.
- Substition of H atom by fluorine at position 8 reduce rate of degradation and elimination.

CLASSIFICATION

- First generation- Non fluorinated quinolones

Eg. Nalidixic acid, oxalinic acid, cinoxasin.

- Second generation- Ciprofloxacin,norfloxacin, ofloxacin.
- Third generation- Levofloxacin,moxifloxacin.

MECHANISM OF ACTION

- Main target is DNA gyrase or topoisomerase.
- Fluoroquinolones affect nicking and sealing proprety of DNA gyrase.
- Ultimate effect on transcription and translation.

RESISTANCE

- Through alteration bacterial cell wall penetration- By efflux mechanism.
- Mutation of genes- Gene gyrase A coding A subunit of DNA gyrase, and in ParC gene coding topoisomerse 4.

Pharmacokinetic property

- Oral absorption is high independent of food.
- Metabolized through oxidation and hydroxylation.
- High urinary concentration due to glomerulor filtration.
- Drug attain high concentration in macrophase and neutrofil due to high lipid solubility.

Contraindication

- Drug affect developing cartilage so not given to pregnant and young animal.
- In cat due to occular problem.
- Cause inhibition of GABA and CNS excitation.
- Cause Mg deficiency due to its chelation.

DRUG INTERACTION

- Fluoroquinolones give synergistic effect with aminoglycoside, β-lactam, and metronidazol.
- Non systemic antacid like sucralfate interfare its absorption.
- Drugs containing divalent and trivalentcation cause chilation

CLINICAL USE

- Infection of skin, soft tissue, urinary tract, oral cavity, respiratory tract,external and middle ear and wound.
- Dose- 5 to 10Mg /Kg oral,I/M or S/C.

BRIEF DESCRIPTION OF DRUGS

1. Nalidixic acid-Used for urinary tract infection but not for systemic infection due to high protein binding.
2. Endrofloxacin- Active in lag and log phase and long post antibiotic effect.
3. Ofloxacin- Useful for systemic and mixed infection and oral bioavailability is high.
4. Pradofloxacin-Active against topoisomeraser4 and DNA gyrase.

THANK YOU VERY MUCH

- HAVE A NICE DAY