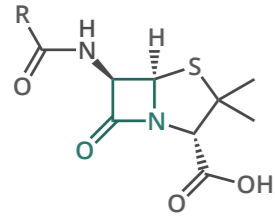


DIFFERENT CLASSES OF ANTIBIOTICS - AN OVERVIEW

Key: ● COMMONLY ACT AS BACTERIOSTATIC AGENTS, RESTRICTING GROWTH & REPRODUCTION ● COMMONLY ACT AS BACTERICIDAL AGENTS, CAUSING BACTERIAL CELL DEATH

β-LACTAMS

MOST WIDELY USED ANTIBIOTICS IN THE NHS



All contain a beta-lactam ring

EXAMPLES

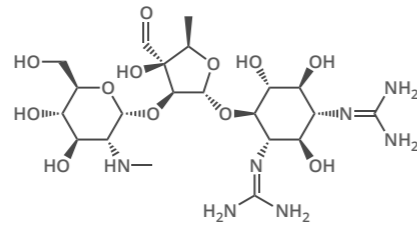
Penicillins (shown) such as amoxicillin and flucloxacillin; Cephalosporins such as cefalexin.

MODE OF ACTION

Inhibit bacteria cell wall biosynthesis.

AMINOGLYCOSIDES

FAMILY OF OVER 20 ANTIBIOTICS



All contain aminosugar substructures

EXAMPLES

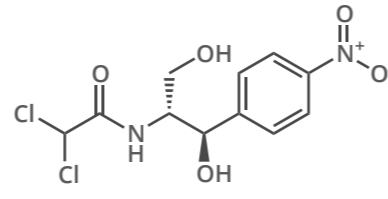
Streptomycin (shown), neomycin, kanamycin, paromomycin.

MODE OF ACTION

Inhibit the synthesis of proteins by bacteria, leading to cell death.

CHLORAMPHENICOL

COMMONLY USED IN LOW INCOME COUNTRIES



Distinct individual compound

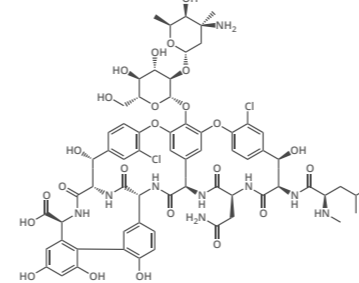
MODE OF ACTION

Inhibits synthesis of proteins, preventing growth.

No longer a first line drug in any developed nation (except for conjunctivitis) due to increased resistance and worries about safety.

GLYCOPEPTIDES

COMMON 'DRUGS OF LAST RESORT'



Consist of carbohydrate linked to a peptide formed of amino acids

EXAMPLES

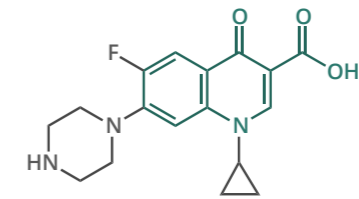
Vancomycin (shown), teicoplanin.

MODE OF ACTION

Inhibit bacteria cell wall biosynthesis.

QUINOLONES

RESISTANCE EVOLVES RAPIDLY



All contain fused aromatic rings with a carboxylic acid group attached

EXAMPLES

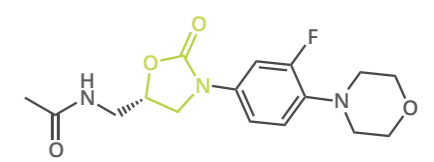
Ciprofloxacin (shown), levofloxacin, trovafloxacin.

MODE OF ACTION

Interfere with bacteria DNA replication and transcription.

OXAZOLIDINONES

POTENT ANTIBIOTICS COMMONLY USED AS 'DRUGS OF LAST RESORT'



All contain 2-oxazolidone somewhere in their structure

EXAMPLES

Linezolid (shown), posizolid, tedizolid, cycloserine.

MODE OF ACTION

Inhibit synthesis of proteins by bacteria, preventing growth.

DISCOVERY

1930

1940

1950

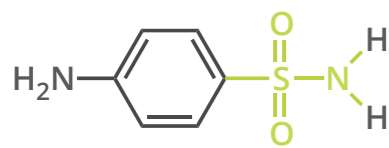
1960

1970

1980

SULFONAMIDES

FIRST COMMERCIAL ANTIBIOTICS WERE SULFONAMIDES



All contain the sulfonamide group

EXAMPLES

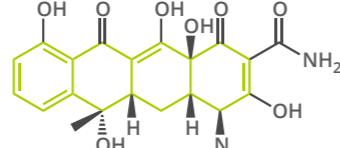
Prontosil, sulfanilamide (shown), sulfadiazine, sulfisoxazole.

MODE OF ACTION

Do not kill bacteria but prevent their growth and multiplication. Cause allergic reactions in some patients.

TETRACYCLINES

BECOMING LESS POPULAR DUE TO DEVELOPMENT OF RESISTANCE



All contain 4 adjacent cyclic hydrocarbon rings

EXAMPLES

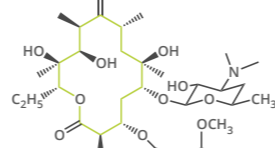
Tetracycline (shown), doxycycline, limecycline, oxytetracycline.

MODE OF ACTION

Inhibit synthesis of proteins by bacteria, preventing growth.

MACROLIDES

SECOND MOST PRESCRIBED ANTIBIOTICS IN THE NHS



All contain a 14-, 15-, or 16-membered macrolide ring

EXAMPLES

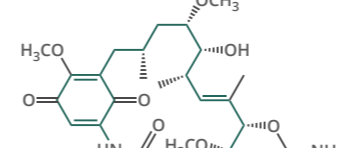
Erythromycin (shown), clarithromycin, azithromycin.

MODE OF ACTION

Inhibit protein synthesis by bacteria, occasionally leading to cell death.

ANSAMYCINS

CAN ALSO DEMONSTRATE ANTIVIRAL ACTIVITY



All contain an aromatic ring bridged by an aliphatic chain.

EXAMPLES

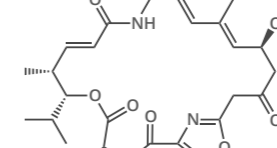
Geldanamycin (shown), rifamycin, naphthomycin.

MODE OF ACTION

Inhibit the synthesis of RNA by bacteria, leading to cell death.

STREPTOGRAMINS

TWO GROUPS OF ANTIBIOTICS THAT ACT SYNERGISTICALLY



Combination of two structurally differing compounds, from groups denoted A & B

EXAMPLES

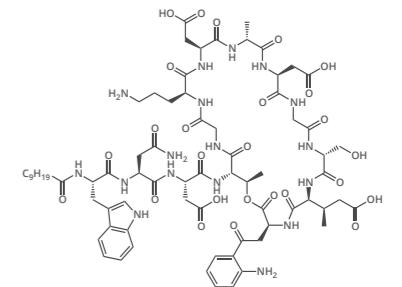
Pristinamycin IIA (shown), Pristinamycin IA.

MODE OF ACTION

Inhibit the synthesis of proteins by bacteria, leading to cell death.

LIPOPEPTIDES

INSTANCES OF RESISTANCE RARE



All contain a lipid bonded to a peptide

EXAMPLES

Daptomycin (shown), surfactin.

MODE OF ACTION

Disrupt multiple cell membrane functions, leading to cell death.

