DIFFERENT CLASSES OF ANTIBIOTICS - AN OVERVIEW

Кеи:



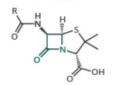
COMMONLY ACT AS BACTERIOSTATIC AGENTS, RESTRICTING GROWTH & REPRODUCTION



COMMONLY ACT AS BACTERICIDAL AGENTS, CAUSING BACTERIAL CELL DEATH

B-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

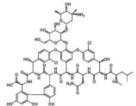
MODE OF ACTION

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

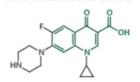
Vancomycin (shown), teicoplanin.

MODE OF ACTION

Inhibit bacteria cell wall biosynthesis.

OUINOLONES

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

EVAMPLES

Daptomycin (shown), surfactin.

MODE OF ACTION

Disrupt multiple cell membrane functions, leading to cell death.

