

Antibiotics

Antibiotics (anti-against biotic=life)

These are class of drugs used as antimicrobials.
 These are chemical substance which are produced by some micro-organism & can be used to either inhibit the growth or even kill other microorganisms which causes infections.

But development of synthetic methods over the recent past, have however resulted in the modification of this definition.

Thus, Antibiotics are not necessarily derived from Micro Organisms.
 Definition

A Substance is classified as Antibiotic if

- 1) It is product of metabolism (It may be produced by chemical synthesis)
- 2) it is a synthetic product produced as a structural analogue of a naturally occurring antibiotic
- 3) it antagonises the growth and for the survival of one or more species of the micro-organism
- 4) it is effective in low concentrations

Development of Antibiotics

The fascinating research in the field of antibiotics started with accidental discovery of Penicillin by Alexander Fleming in 1928.

In 1944, isolation of streptomycin from "Streptomyces griseus", which has inhibitory activity against Mycobacterium tuberculosis as well as gram-negative bacteria.

The success of antibiotics in the treatment of the diseases of man has prompted their use for a number of related fields. Intensive use of antimicrobials has now been made in Veterinary medicines & in treating diseases of plant.

Types of antibiotics

The antibiotics can be either bactericidal or bacteriostatic

Bactericidal

Penicillin

Aminoglycosides
(Streptomycin)
ofloxacin

Bacteriostatic

Erythromycin

Tetracycline

Chloramphenicol

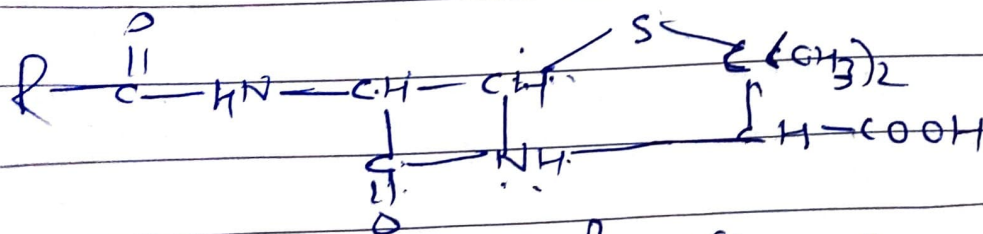
Broad Spectrum Antibiotics

The full range of microorganism attacked by an antibiotic is called its spectrum.

Eg. tetracycline, ofloxacin, chloramphenicol
is broad spectrum Antibiotic

Penicillins

it has got β -lactam triazolidine structure.



R = $\text{C}_6\text{H}_5\text{CH}_2$ → Penicillin-G

R = $\text{C}_6\text{H}_5\text{CH}(\text{NH}_2)$ → Ampicillin

→ limited no. of antibiotics also possesses anti-protzoal activity

→ Antibiotics are not effective against
Viruses such as Human Cold etc

→ Empiric therapy

When an infection is suspected of being
responsible for an illness but the
responsible pathogen has not been identified,
broad spectrum antibiotics are given

Gram +ve - Takes up crystal violet stain used in
the test & appears to be purple. Thick
peptidoglycan layer in bacterial cell wall

Gram -ve - Cannot retain the violet stain