



MICROBIOLOGY



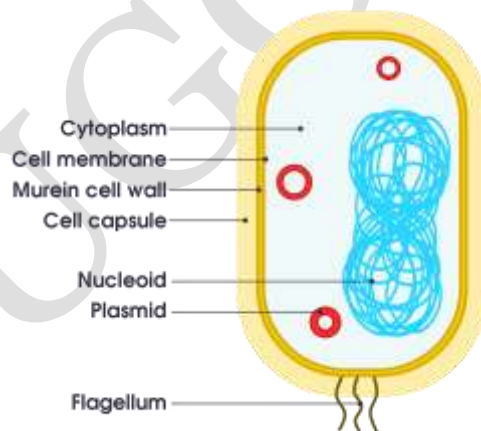
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An antibiotic is a type of antimicrobial substance active against bacteria and is most important type of antibacterial agent for fighting bacterial infection.

Function of Antibiotics:

1. Antibiotics are used to prevent some types of bacterial infection.
2. They work by killing bacteria from reproducing and spreading.
3. They commonly block biochemical pathways important for bacteria.
4. Many antibiotics work against many species of bacteria rather than simply working against one.
5. Antibiotics can help treat minor infections, like urinary or respiratory tract infections.

Write down the different part of bacteria and mention the target of antibiotic action.



Different parts of bacteria

Targets are following:

1. Inhibition of Cell wall synthesis
2. Inhibition of Protein synthesis
3. Inhibition of DNA synthesis

Mechanism of cell wall synthesis inhibitors

Antibiotics bind to bacterial cell wall proteins
Example: PBP binds with Beta-lactam antibiotics such as penicillin.



Inhibition of synthesis of cell wall components.
Example: Peptidoglycan



Damage to bacterial cell wall.



Inhibition of bacterial gyrase.



Inhibition of the bacteria.

Mechanism of Protein synthesis inhibitors

Interfere with initiation codon functions



Block association of 50s ribosome subunit with mRNA-30s.



Misreading of code incorporation of wrong amino acid.



Block the attachment of aminoacyl tRNA to acceptor site.



Inhibits the protein synthesis.



Inhibits the bacteria.

Mechanism of DNA synthesis inhibitors

Inhibit alpha (α) subunit DNA gyrase



(+) Supercoiling



(-) DNA synthesis

Give example of antibiotics in different target of bacteria.

➤ Cell wall synthesis

Example:

- ❖ Cycloserine
- ❖ Vancomycin
- ❖ Penicillins
- ❖ Cephalosporins

➤ DNA gyrase

Example:

- ❖ Nalidixic
- ❖ Ciprofloxacin
- ❖ Novobiocin

➤ Protein synthesis (50s inhibitors)

Example:

- ❖ Erythromycin
- ❖ Chloramphenicol
- ❖ Clindamycin
- ❖ Lincomycin

➤ **Protein synthesis (30s inhibitors)**

Example:

- ❖ Tetracyclines
- ❖ Spectinomycin
- ❖ Streptomycin
- ❖ Amikacin

➤ **Folic acid metabolism**

Example:

- ❖ Trimethoprim
- ❖ Sulfonamide