

MLT 2nd

Course Title: General pharmacology I (LAB)

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Discuss mechanism of antibiotics according to different targets and classify them one by one.

Ans: Mechanism of antibiotic: Antibacterial effects generally belong to one of four mechanisms, three of which involve the inhibition or regulation of enzymes involved in cell wall biosynthesis, nucleic acid metabolism and repair, or protein synthesis, respectively. The fourth mechanism involves the destruction of the membrane structure.

There are three main antibiotic targets in bacteria: the cell wall or cell membrane surrounding the bacterial cell. A machine that produces nucleic acid DNA and RNA. Mechanism of protein production (ribosomes and related proteins).

Many antibiotics (including penicillin) work by attacking the cell walls of bacteria. These drugs are achieved by preventing key molecules from binding to selected sites on the cell structure called ribosomes where protein synthesis occurs.

1) Antibiotic target cell wall of the bacterial cell:

Peptidoglycan is a promising target in the bacterial cell wall in the discovery of broad-spectrum antibacterial drugs, because the disaccharide pentapeptide peptidoglycan structure is common for both Gram-negative and Gram-positive bacteria. So far, a series of antibiotics against peptidoglycan have been developed.

2) The machineries that make the nucleic acids DNA and RNA.

RNA has a variety of structures, including protrusions and internal loops, capable of forming tertiary contacts or acting as ligand binding sites. The recent increase in structural and functional information related to RNA has made them a drug target for small molecule therapy. In addition, the recognition of the significant difference between prokaryotic and eukaryotic rRNA has led to the development of antibiotics that specifically target bacterial rRNA and reduce protein translation to inhibit bacterial growth. In order to promote the development of new

antibiotics targeting RNA, we review here the literature on such antibiotics, mRNA, riboswitches and tRNA and key methods for their screening.

3) Mechanism of protein production:

Protein synthesis is a complex multi-step process involving many enzymes and conformational alignment. However, most antibiotics that prevent bacterial protein synthesis interfere with the 30S or 50S subunit of the 70S bacterial ribosome.