



## ***SMART PHARMACOLOGY***

### ***LESSON 8***

#### ***Task 1***

Give the main definition to antibiotics. Please specify who has discovered the first antibiotic and when?

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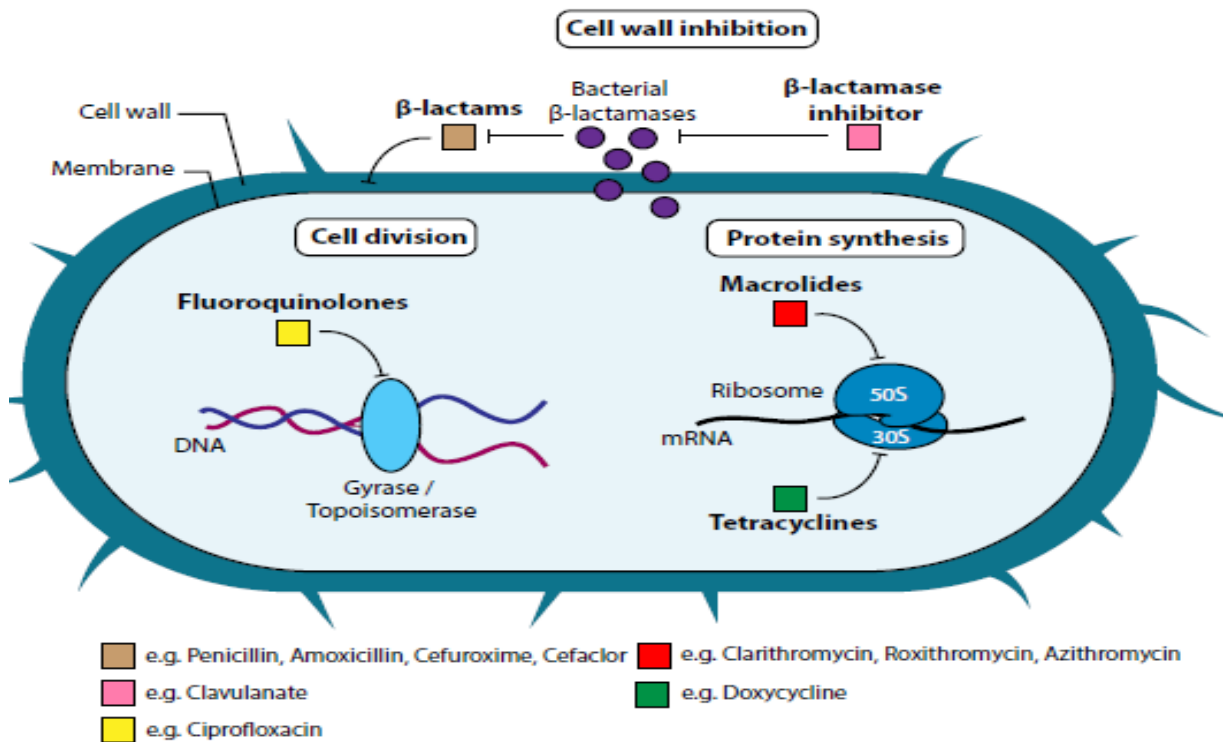
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#### ***Task 2***

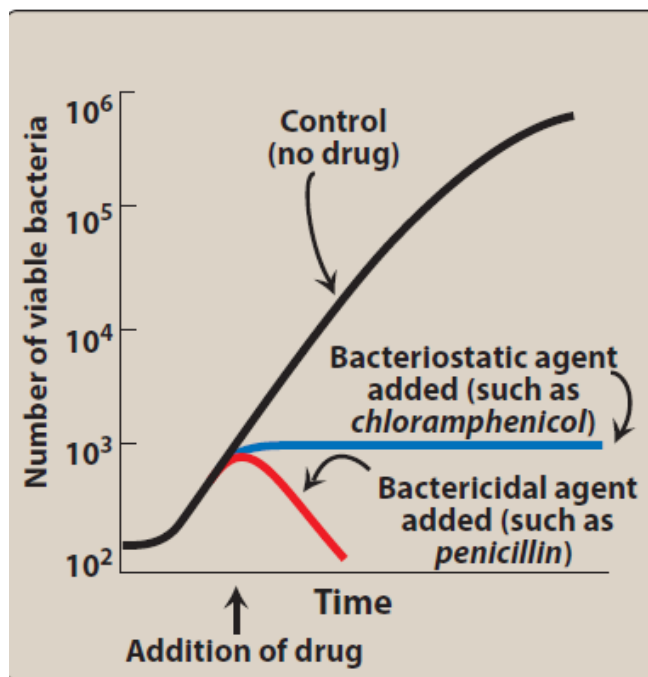
. What classification of antibiotic can be used ? Find the group of antibiotics which acts on the bacterial cell? Please describe what are the differences between the mechanism of action of different groups of antibiotics?

I. $\beta$ -Lactams 1.	2. 3. Carbapenems and monobactams II. Glycopeptides III. Macrolides and azalides IV. Tetracyclines V. Aminoglycosides	VI. Polymyxins VII. Gramicidin VII. Cycloserine IX. Antifungal A X. Linkozamides XI. Chloramphenicols XII. Fuzidins
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### Task 3

Name the main features of antibiotic characteristic.

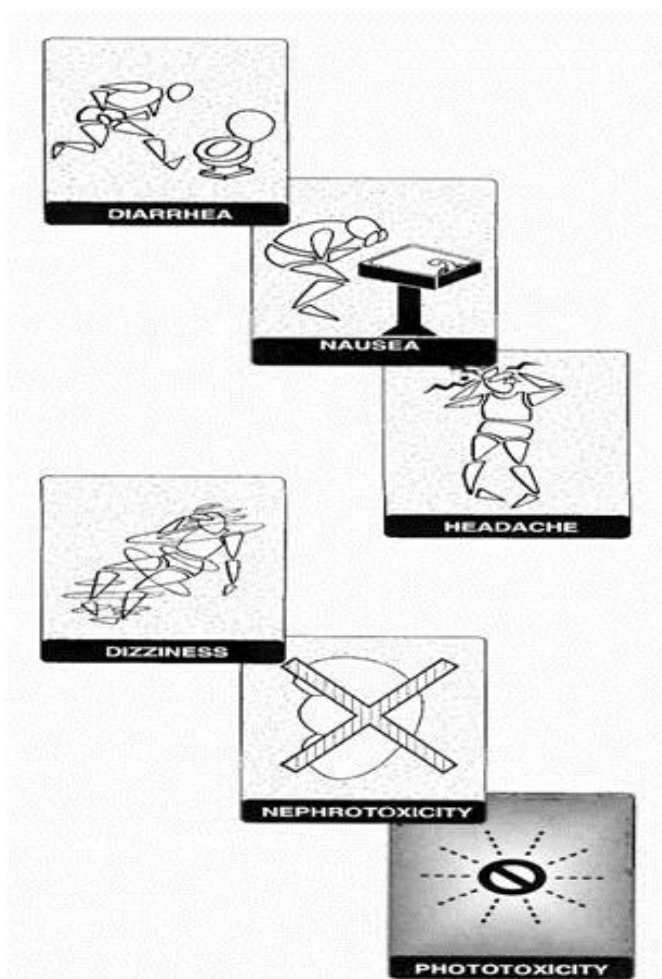


Nº	Features	Characteristics
1.	<b>Bacteriostatic action</b>	
2.	<b>Bactericidal action</b>	

3.	<b>First therapy line</b>	
4.	<b>Second therapy line</b>	
5.	<b>Reserve antibiotics</b>	
6.	<b>Wide spectrum antibiotics</b>	
7.	<b>Narrow spectrum antibiotics</b>	

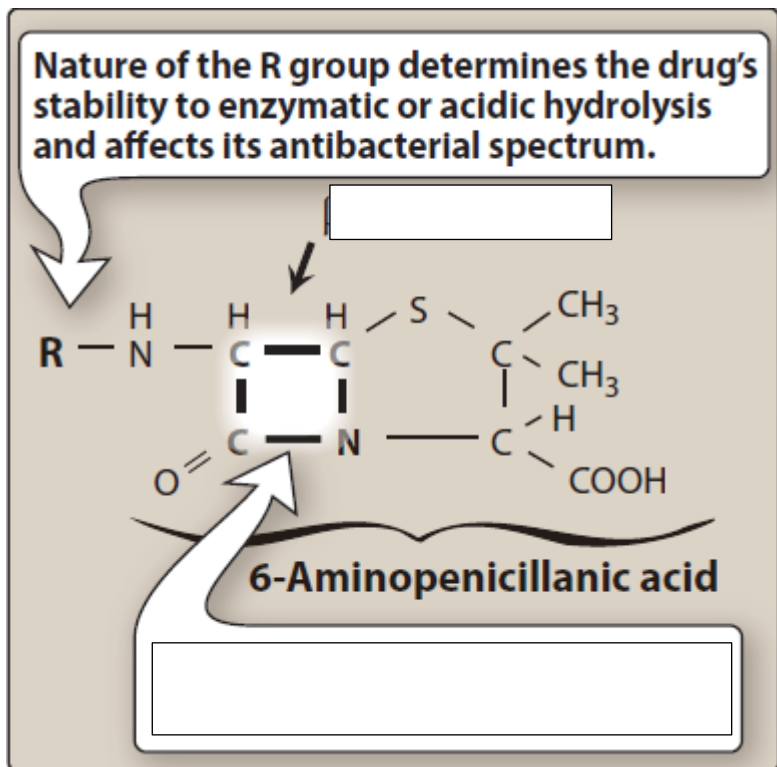
**Task 4**

What are the main side effects of antibiotic treatment?



**Task 5**

Indicate the site of stability and site of penicillinase/acid action. Describe the meaning of  $\beta$  lactamase inhibitors?





**Task 6**

Fill the table about natural and semi-synthetic penicillins. What are the features of these drugs?

Natural		Semi-synthetic			
<i>Short-acting</i>	<i>Depo-medicines</i>	<i>Antistaphylococcal</i>	<i>Amino-penicillins</i>	<i>Antipseudomonal</i>	<i>Combined</i>

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**Task 7**

Please name the drugs from cephalosporins group? Fill the table

<i>The Ist generation</i>	<i>The IInd genera- tion</i>	<i>The IIIrd genera- tion</i>	<i>The IVth genera- tion</i>
<b>PARENTERAL</b>			
<i>Cephalothin</i>	<i>Cefuroxime</i>	<i>Cefotaxime</i>	
<i>Cefazolin</i>			–
	<i>Cefoxitin</i>	<i>Ceftazidime</i>	–
			–
<b>PERORAL</b>			
<i>Cephalexin</i>	<i>Cefuroxime axetil</i>	<i>Cefixime</i>	–
<i>Cefadroxil</i>		<i>Cefbuten</i>	–

### First Generation

**Cefazolin**

This first-generation parenteral cephalosporin has a longer duration of action and a similar spectrum of action, compared to other first-generation drugs. It penetrates well into bone.

**Cefadroxil**

**Cephalexin**

This is the prototype of first-generation, oral cephalosporins. Oral administration twice daily is effective against pharyngitis.

### Second Generation

**Cefuroxime sodium**

This prototype second-generation, parenteral cephalosporin has a longer half-life than similar agents. It crosses the blood-brain barrier, and it can be used for community-acquired bronchitis or pneumonia in the elderly and for patients who are immunocompromised.

**Cefuroxime axetil**

Administered twice daily, this drug is well absorbed and is active against  $\beta$ -lactamase-producing organisms.

### Third Generation

**Cefdinir**  
**Cefixime**

These are administered orally once daily.

**Cefotaxime**

This penetrates well into the CSF.

**Ceftazidime**

This is active against *Pseudomonas aeruginosa*.

**Ceftibuten**

This drug has the longest half-life of any cephalosporin (6 to 8 hours), which permits once-a-day dosing. High levels of the drug can be achieved in blood and CSF. It is effective against genital, anal, and pharyngeal penicillin-resistant *Neisseria gonorrhoeae*. The drug is excreted in bile and may be used in patients with renal insufficiency. It has good penetration into bone.

**Ceftriaxone**

### Fourth Generation

**Cefepime**

This is active against *Pseudomonas aeruginosa*.

**Task 8**

Please compare the features of penicillins and cephalosporins.

	Penicillins	Cephalosporins
Type of action		
Range		
Structure		
Mechanism of action		
Specific side effects		
PK profile (absorption etc)		
Toxicity		
Combination with other drugs		