

Teaching Unit 6 Antibiotics as drugs

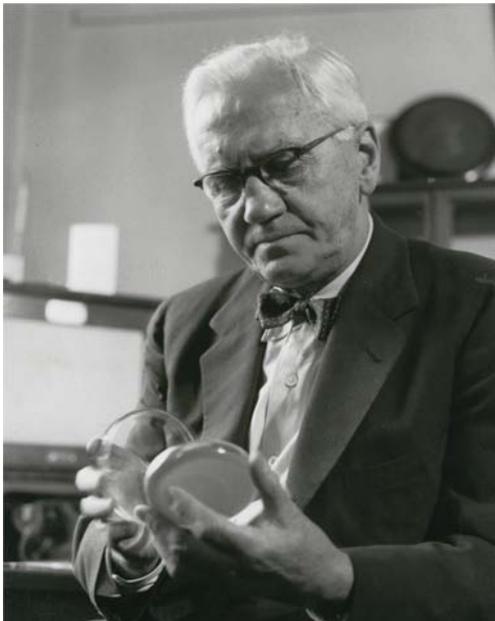
Keywords and concepts: Antibiotics. Alexander Fleming. History of Science. Action mechanisms of antibiotics. Antibiotic resistance.

'Xplore Health related tools: Game to engage in a dialogue: *Access to treatment!*

Introduction: Antibiotics are substances that are toxic to bacteria at low doses but innocuous to human beings. Hence, at the proper dosage, antibiotics can be used to treat diseases of a bacterial origin. In this teaching unit you will learn about antibiotics action mechanisms and about the problems with antibiotic resistances.

ACTIVITY 1

Do you know what the first antibiotic that was discovered was? The man in the picture was the one who discovered it, what was his name? How did he discover the antibiotic? Where did he work? Surf the Internet for information.



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ACTIVITY 2

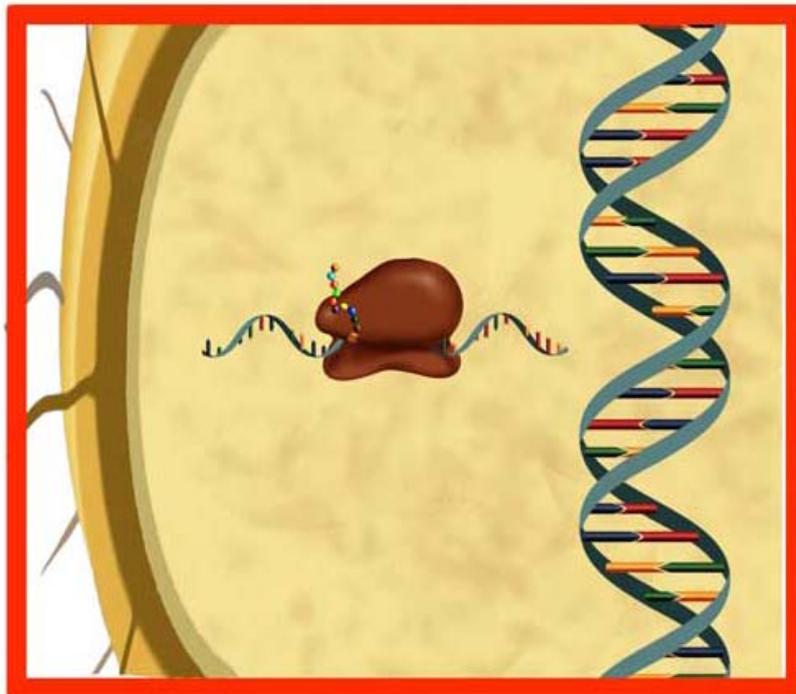
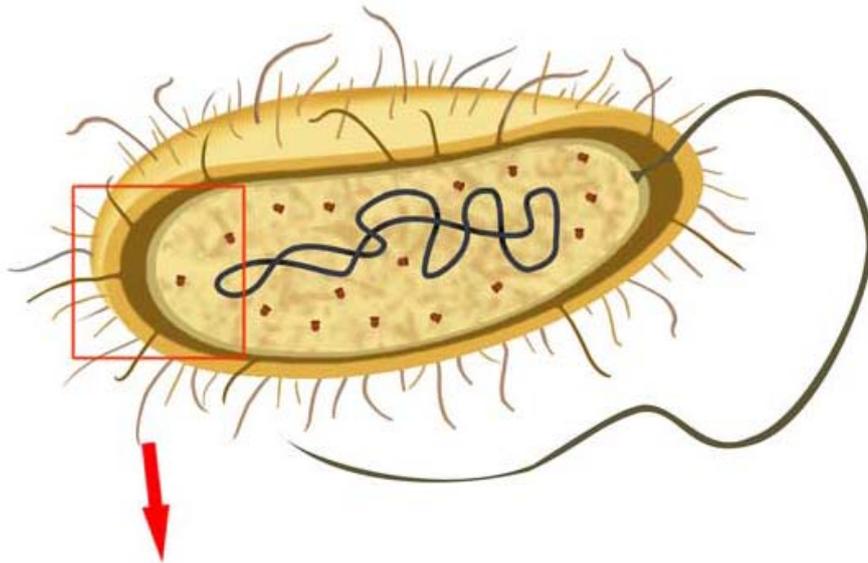
As you know antibiotics are used to fight bacterial diseases, but do you know how they really do it? Please take a look at the following table which shows information on different antibiotics and their different action mechanisms.

ANTIBIOTIC	ORIGIN	ACTION MECHANISM
Streptomycin	<i>Streptomyces griseus</i>	Inhibits protein synthesis
Chloranphenicol	<i>Streptomyces venezuelae</i>	Inhibits protein synthesis
Polymyxin B	<i>Bacillus spp.</i>	Disorganises the membrane
Amoxicillin	synthetic	Inhibits wall synthesis
Ciprofloxacin	synthetic	Interferes with DNA
Penicillin	<i>Penicillium notatum</i> <i>Penicillium chrysogenum</i>	Inhibits wall synthesis
Ofloxacin	synthetic	Interferes with DNA
Kanamycin	<i>Streptomyces kanamiceticus</i>	Inhibits protein synthesis
Erythromycin	<i>Streptomyces erythreus</i>	Inhibits protein synthesis
Colistin	<i>Bacillus polymyxa</i>	Disorganises the membrane
Cephalosporin	<i>Cephalosporium sp.</i>	Inhibits wall synthesis

a) Using the following table classify the antibiotics shown in the table above according to their action mechanism.

MECHANISM 1:	MECHANISM 2:	MECHANISM 3:	MECHANISM 4:
			I

b) The following drawing shows the elements of a bacterium, write the name of each element next to its drawing.



c) Now, use arrows to show on which of the elements that you have just identified would each of the action mechanisms act. Make a hypothesis on why the mechanism would work in each case.

d) Would you take an antibiotic to cure a cold? Why?

- e) Make a list of the antibiotics that you find in the medicine cabinet at home (if there are any) or that you remember taking at some point. If you can't find any look them up on the Internet. Search information to find out what action mechanism each of the antibiotics has and what they are used for. Remember that when you look at your medicine cabinet you should identify what the active ingredient is in order to do the search.

ACTIVITY 3

You have probably heard about the resistance that some bacteria develop to antibiotics (you will find information on this subject on the Information Menu A of the game "Discussion Continuum: Access to treatment").

- f) Why do bacteria develop this resistance? What problem does this cause?

g) What is our responsibility as citizens in the acquisition of these resistances? What would the solution be?

**h) Give your opinion on the following statement that appears in the Discussion Continuum:
“Antibiotics should never sold without a prescription”**

ACTIVITY 4

Read the following article “Race against time to develop new antibiotics”

(<http://www.who.int/bulletin/volumes/89/2/11-030211/en/index.html>) from the Bulletin of the World Health Organization and in groups find the following information:

a) What are the ethical and social topics that the article tackles?

b) Which are the reasons why we are likely to have problems with antibiotic resistance in the future?

c) Which are the reasons for hope in this race against time to develop new antibiotics?

d) Which could be some possible solutions to the problem?