Biology Grade 8

CHAPTER : IMMUNE THERAPEUTICS

Activity 2: Asepsis and Antisepsis

INSTRUCTOR: SUHAIB AUDI

- Sometimes, to better defend itself, the body needs certain aids, independent of the immune system, that ensure prevention of infection or destruction of microbes after infection.
- What are these different sorts of aids?

1) Preventive measures – to prevent infection:

Sterilization (Kill the germs)

Kill the germs inside the whole room

Asepsis

- Asepsis is the total absence of microbes. It is mandatory for example during surgeries.
- It is provided by the sterilization of the operating area and the surgical instruments. Sterilization is the destruction of microbes.
- It can be obtained by several means, including treatment of instruments at very high temperature, and use of disinfectants, such as bleach, for the floor.

Kill the germs at the wounded skin

Antisepsis

- The skin is the most important barrier against infection.
- In case of a wound, it is necessary to wash abundantly the wound with water and soap, then to apply a solution, called antiseptic, that slows down or prevents the multiplication of microbes.
- The most common antiseptics that are used externally, are eosin, hydrogen peroxide, alcohol and iodine.
- **They are toxic for bacteria, but not for human cells. After cleansing, it is important to cover the wound with a sterile dressing.**

2) Curative Measures - to treat and eliminate infection.

- **Chemotherapy**: Use of medications to destroy microbes (bacteria, viruses, parasites) or abnormal cells (like cancer cells).

- **Antibiotherapy:** A type of chemotherapy targeting **bacteria** using antibiotics.

- **Antibiotics** are medications that kill or stop the growth of bacteria.

- Penicillin was the first discovered antibiotic.

- It is a natural antibiotic extracted from a mold (Penicillium).

❑ Application:

Alexander Fleming was culturing his bacteria when accidently were contaminated by a **green yeast called pencillium.** Few hours later, a unexpected result was observed

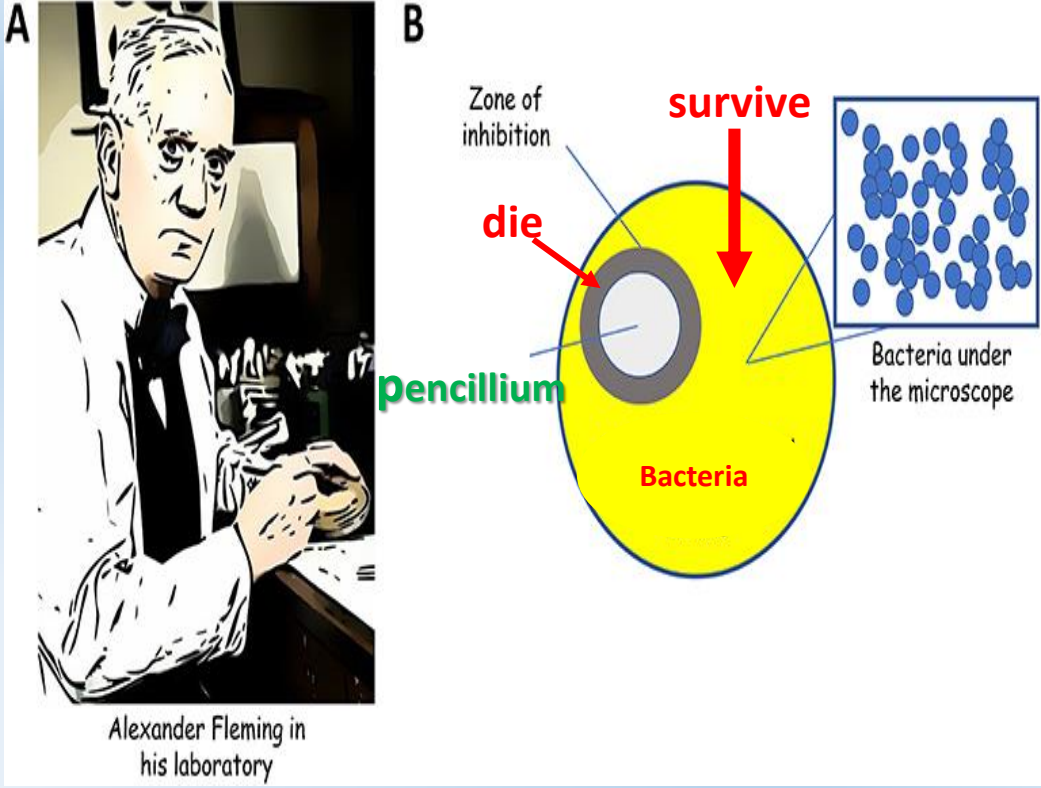
1. Pick out the unexpected observation.

A large zone without bacteria appeared around the pencillium.

Bacteria die around pencillium.

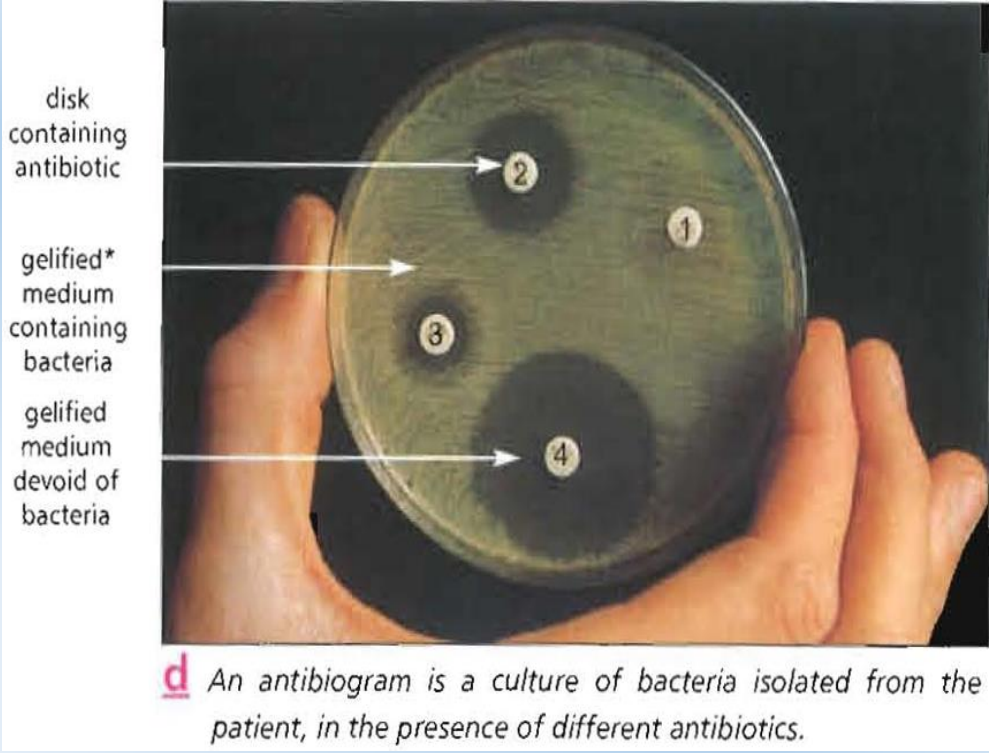
2. Formulate a hypothesis concerning the nature of the substance released by penicillium.

Hypothesis: Pencillium releases an anti-bacterial substance.



❖ Choosing the Right Antibiotic - Antibiogram

- An antibiogram helps identify the most effective antibiotic.
- Bacteria from the patient are spread on a petri dish.
- Small discs with different antibiotics are placed on the dish.
- After some time, **clear zones** appear where bacteria were killed or stopped from growing.
- **The largest clear zone of inhibition (circle with biggest diameter) shows the most effective antibiotic.**
- **The most effective antibiotic is 4 because it has the largest zone of inhibition (clear zone) and the least efficient antibiotic is 1 since it has no zone of inhibition.**



d An antibiogram is a culture of bacteria isolated from the patient, in the presence of different antibiotics.

- Note: Antibiotics are only effective against bacteria.
- They do not work against viruses like cold, flu, chickenpox, or COVID-19.

Summary:

Antisepsis	Asepsis	Antibiotherapy
Uses antiseptics to kill or inhibit pathogens, applied on living tissues (skin, wounds)	Involves techniques to prevent contamination by pathogens: Disinfection Sterilization applied on non-living surfaces	Uses antibiotics to treat bacterial infections inside the body.
Ex: Alcohol, Iodine	Ex: Bleach, Heating	Ex: Penicillin
Preventive	Preventive	Curative