

اصياء عهريه عمال

1. Practical Microbiolog

Introduction

Microbiology is the study of microorganisms, a large and diverse group of microscopic organisms that exist as single cells or cell clusters; it also includes viruses, which are microscopic but not cellular.

Structure and taxonomy of bacteria

Bacteria form a heterogeneous group of unicellular organisms. Their cellular organization is described as *prokaryotic* (i.e. having a primitive nucleus), and differs from that of *eukaryotic* cells, in which the chromosomes are in a nucleus surrounded by a nuclear membrane, as in plants and animals.

Genome. The most fundamental difference between bacteria and eukaryotes is that the bacterial chromosome, or *genome*, is a single circular molecule of double-stranded DNA: there is no nuclear membrane. Bacteria may from time to time harbour *plasmids* (smaller circular DNA molecules), some of which code for certain accessory functions.

STRUCTURE

Shape: Bacteria have a rigid wall, which determines their shape. They may be:

- spherical - cocci
- cylindrical - bacilli or rods
- helical - spirochaetes.

Arrangement: depends on the plane of successive cell divisions. Examples of different arrangements are chains, e.g. streptococci; clusters, e.g. staphylococci; diplococci, e.g. pneumococci; angled pairs or palisades, e.g. corynebacteria.

Safe Laboratory Practices & Procedures

1: Ask yourself, "What am I working with? What are the hazards?"

- Common hazards in the laboratory include: animal, biological, chemical, physical, and radiological. If there is an accident or emergency situation involving these hazards:
 - Seek immediate assistance. If you are splashed by any of these materials, use running water from an eyewash station or emergency shower for at least 15 minutes or until emergency assistance arrives and provides you with different instructions,
 - Report to your supervisor any accident, injury, or uncontrolled release of potentially hazardous materials - no matter how trivial the accident, injury, or release may appear.

2: Be prepared.

- Attend all required laboratory safety training prior to the start of your research assignment.
- Read all procedures and associated safety information prior to the start of an experiment.
- Perform only those experiments authorized by your supervisor.
- Follow all written and verbal instructions. Ask for assistance if you need guidance or help.
- Work under direct supervision at all times. Never work alone in the laboratory.
- Know the locations and operating procedures for all safety equipment. This includes the eyewash station and safety shower.
- Know the locations of the nearest fire alarms and at least two ways out of the building. Never use an elevator in emergencies.
- Be alert and proceed with caution at all times in the laboratory. Immediately notify the supervisor of any unsafe conditions.
- Know the proper emergency response procedures for accidents or injuries in the laboratory.

3: Prevent potential exposure.

- Conduct yourself in a responsible and professional manner *at all times*. No pranks. No practical jokes.
- Dress for work in the laboratory. Wear clothing and shoes that cover exposed skin and protect you from potential splashes. Tie back long hair, jewelry, or anything that may catch in equipment.
- Never eat food, drink beverages, chew gum, apply cosmetics (including lip balm), or handle contact lenses in the laboratory.
- Use a chemical fume hood or biosafety cabinet, as directed by your supervisor.
- Observe good housekeeping - keep aisles clear.
- Report damaged electrical equipment to the supervisor. Do not use damaged electrical equipment.
- Do not leave active experiments unattended. Never leave anything that is being heated or is visibly reacting unattended.

4: Protect yourself, others, your research, and the environment.

- Practice good personal hygiene. Wash your hands after removing gloves, before leaving the laboratory, and after handling a potentially hazardous material.
- While working in the laboratory, wear personal protective equipment - eye protection, gloves, laboratory coat - as directed by your supervisor.
- Properly segregate and dispose of all laboratory waste.

