

Learning Objectives

After completing this lesson, students will be able to

- identify different groups of bacteria based on their shape and structure.
- categorize types of viruses.
- know the role of microbes in agriculture, food industries and medicine.
- gain knowledge on modes of infection and disease transmission.
- describe the spectrum of diseases on the basis of the causative agents.
- know disease control and preventive measures.



Introduction

Microbiology (greek words: mikros -small, bios- life bearing, logy- study), is a branch of biology that deals with living organisms of microscopic size, which include bacteria, fungi, algae, protozoa and viruses. Microbes are found in habitats like terrestrial, aquatic, atmospheric or in living hosts. Some of them survive in extreme environments like hot springs, ice sheets, water bodies with high salt content and low oxygen, and in arid places with limited water availability.

Some of the microorganisms are beneficial to us and they are used in the preparation of curd, bread, cheese, alcohol, vaccines and vitamins, while some others are harmful causing diseases to plants and animals including human being. This lesson will explore the beneficial and harmful effects of microbes in relation to welfare of human kind.

22.1 Microbes and their Types

Microorganisms differ from each other in size, morphology, habitat, metabolism

and several other features. Microbes may be unicellular (Bacteria), multicellular (Fungi), acellular (not composed of cells-Virus). Types of microbes include bacteria, viruses, fungi, microscopic algae and protists.

22.1.1 Bacteria

Bacteria are microscopic, single celled prokaryotic organisms without nucleus and other cell organelles. Although majority of bacterial species exist as single celled forms, some appear to be filaments of loosely joined cells. The size varies from less than 1 to 10 μm in length and 0.2 to 1 μm micrometer in width. Bacteria may be motile or non-motile. Special structures called flagella are found on the cell surfaces for motility

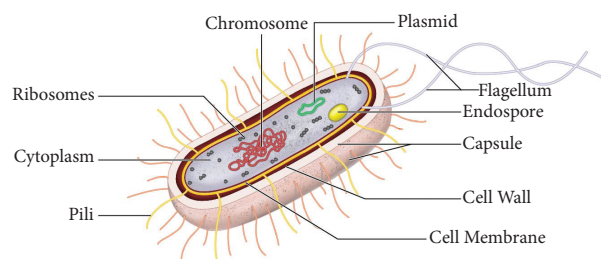


Figure 22.1 Structure of a bacterial cell