

Microbiology an Introduction



Learning Objectives

At the end of this lecture you should be able to:

1. Summarize the relative burden of human diseases caused by microbes.
2. Explain spontaneous generation and role of Pasteur in disproving it.
3. Name the four main families of biochemicals.

Learning Guide Questions

The answers to these questions are covered both in the lecture material and the text book.

1. Define spontaneous generation.
2. Explain the role of a pathogen in causing an infectious disease.
3. Using the figure below, describe Pasteur's experiments disproving spontaneous generation.
4. Define macromolecules and state what the monomers are the four main biochemical macromolecules of a cell.

According to the hypothesis of spontaneous generation, life can arise spontaneously from nonliving matter, such as dead corpses and soil. Pasteur's experiment, described below, demonstrated that microbes are present in nonliving matter—air, liquids, and solids.

1 Pasteur first poured beef broth into a long-necked flask.

Microorganisms were present in the broth.

2 Next he heated the neck of the flask and bent it into an S-shape; then he boiled the broth for several minutes.

Microorganisms were not present in the broth after boiling.

3 Microorganisms did not appear in the cooled solution, even after long periods.

Microorganisms were not present even after long periods.

NEW CONCEPT

- Pasteur demonstrated that microbes are responsible for food spoilage, leading microorganisms to the connection between microbes and disease.
- His experiments and observations provided the basis of aseptic techniques, which are used to prevent microbial contamination, as shown in the photo at right.

Some of these original vessels are still on display at the Pasteur Institute in Paris. They have been sealed but show no sign of contamination more than 100 years later.

Microbiology 2420 Study Guide

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