

The World of Microorganisms

Discover the tiny living things all around us, invisible to the naked eye. They are everywhere—in water, soil, and even on mountains.



Types of Microorganisms

Microorganisms are broadly classified into four major groups:



Bacteria



Fungi



Protozoa



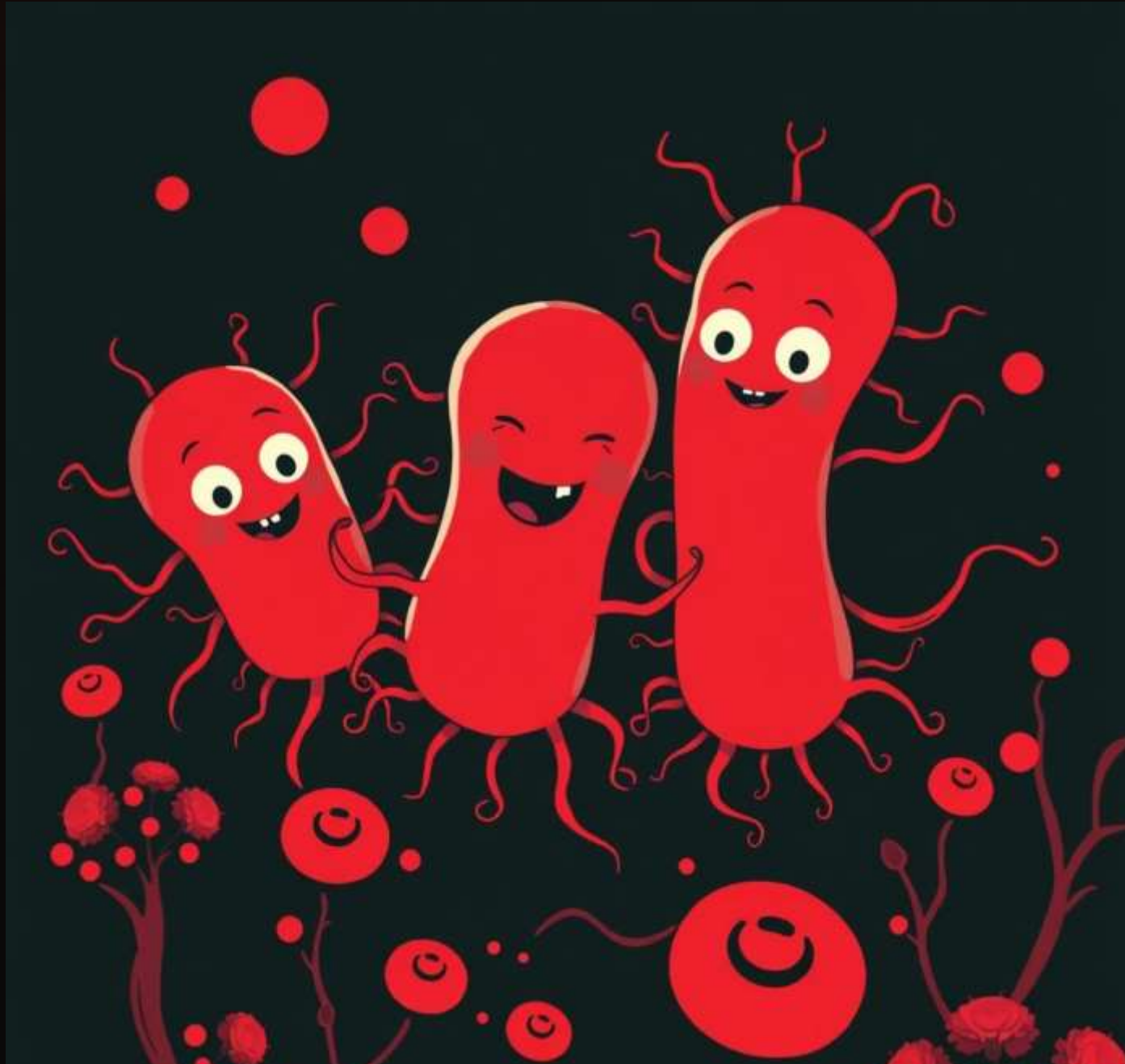
Algae

Viruses are also considered microscopic microorganisms.

Friends and Foe: The Dual Nature

Useful Microorganisms (Friends)

Some microorganisms are very helpful and beneficial for us in our daily lives and in various industries.



Harmful Microorganisms (Foe)

Many microorganisms can cause harm to us, including diseases and food spoilage.



Friendly Microorganisms: Our Helpers in Food!

Yeast

Used in baking to make delicious breads, cakes, and pastries. It helps dough rise.

Lactobacillus

This bacterium is essential for transforming milk into curd, giving it its characteristic texture and taste.



Friendly Microorganisms: Commercial and Medicinal Uses

Commercial Production

Yeast is used in the distillery industry for large-scale production of alcohol, beer, and wine.



Medicine

- Some bacteria produce antibiotics to fight infections.
- Microorganisms are used to produce vaccines.
- Vaccination protects against diseases like cholera, tuberculosis, and hepatitis.





Friendly Microorganisms: Environmental Benefits



Increasing Soil Fertility

Certain bacteria and blue-green algae help increase soil fertility through atmospheric nitrogen fixation, converting nitrogen into ammonia.



Biogas Production

Friendly anaerobic bacteria are used to create biogas, a useful mixture of methane, carbon dioxide, hydrogen, and hydrogen sulphide.

Harmful Microorganisms: Pathogens and Disease Spread

Harmful microorganisms that cause diseases are known as pathogens.

Non-communicable diseases

Cannot be transferred from one person to another.

Communicable (Infectious) diseases

Transferred from an infected person to a healthy person via air, water, or food.

Insects and animals like houseflies and mosquitoes act as carriers, helping diseases spread.

Harmful Microorganisms: Common Human Diseases & Prevention

1

Common Cold

A very common communicable disease.

2

Cholera

Carried by houseflies. Prevent by keeping food covered and avoiding uncovered items.

3

Malaria

Female Anopheles mosquito carries Plasmodium. Use repellents and nets for protection.



Harmful Microorganisms: Diseases in Animals and Plants

Animal Diseases

- **Anthrax:** A bacterial disease caused by *Bacillus anthracis*.
- **Foot-and-mouth disease:** Affects cattle, caused by a virus.



Plant Diseases

Various microorganisms cause diseases in different plants, which can significantly impact crop yields and agricultural productivity.



Food Spoilage and Preservation

Food left uncovered can turn stale and poisonous due to bacteria like Clostridium, Bacillus, and Staphylococcus, causing food poisoning.

Spoilage Causes

Bacteria are the primary culprits behind food going bad.

Food Poisoning

Certain bacteria can lead to harmful food poisoning.

Preservation

Methods like pasteurization (for milk) help keep food safe.

