

Microbiology

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Microbiology: It is the science that deals with the study of microorganisms (the smallest forms of life organisms too small to be seen with the naked eye). A microscope is needed to view them.

Branches of microbiology:

Medical microbiology

Industrial microbiology

Food microbiology

Soil microbiology

Medical microbiology: Is the study of causative agents of infectious diseases of human being and his reactions. In other words it deals with diseases, laboratory diagnosis, treatment, epidemiology and prevention of infection.

The medical microbiology: Is studied under the following Headings: **Bacteriology ,Virology ,Mycology and Immunology.**

The agents of human infections belong to five major groups:

Bacteria, viruses, fungi , helminths and protozoa.

Naming Microorganisms:

- Binomial (scientific) nomenclature
- Gives each microbe 2 names:
 - **Genus** - noun, always capitalized
 - **species** - adjective, lowercase
- Both *italicized* or underlined
 - *Staphylococcus aureus* (*S. aureus*)
 - *Bacillus subtilis* (*B. subtilis*)
 - Escherichia coli (E. coli)

The classification of bacteria is based on various criteria, such as the nature of the cell wall, staining characteristics, ability to grow in the presence or absence of oxygen, and ability to form spores. The criterion currently used is the base sequence of the genome

DNA, bacteria have been reclassified on the basis of this information.

Types of microorganisms:

Commensals: Microorganisms that can live in a host without causing any disease.

Saprophytes: They are free living microorganisms which live on decaying organic matter.

Pathogens: Microorganisms which are capable of producing disease in a host.

Note : Commensals can be converted to pathogens in case of disturbance in immunity.

The application of microbiology in our life:

1. Medical applications: ex. Vaccines , antibiotics and enzymes.
- 2 . Industry: ex. Food industry.
- 3.In nature :ex.recycling the materials by realizing the organic materials from dead bodies .
4. Microorganism is used as a tool in genetic engineering & biotechnology :ex. Recombinant vaccines ,enzymes ,hormones and gene therapy.

