

MICROBIOLOGY

- **Microbiology can be defined as the biology of microscopic organisms, or life too small to be seen with the naked eye. Microbiology covers several disciplines, including virology (study of viruses), bacteriology (study of bacteria), mycology (study of fungi), and parasitology (study of parasites). Each of these disciplines may include but is not limited to studies of infectious disease-causing microorganisms.**
- **For example, specialties within microbiology may include microbial physiology (i.e., microbial growth, metabolism, structure), microbial genetics and evolution, environmental microbiology (i.e., microbial ecology), industrial microbiology (i.e., industrial fermentation, wastewater treatment), and food microbiology (i.e., use of microbes for food production, fermentation)**

- ***Departments of microbiology***

- The departments of microbiology can be classified into pure and applied sciences. Microbiology can be also classified based on taxonomy, in the cases of bacteriology, mycology, protozoology, and phycology. There is considerable overlap between the specific branches of microbiology with each other and with other disciplines, and certain aspects of these branches can extend beyond the traditional scope of microbiology.

- Bacteriology: The study of bacteria.
- Mycology: The study of fungi.
- Protozoology: The study of protozoa.
- Phycology/algology: The study of algae.
- Parasitology: The study of parasites.
- Immunology: The study of the immune system.
- Virology: The study of viruses.
- Nematology: The study of nematodes.
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- Microbial physiology: The study of how the microbial cell functions biochemically. Includes the study of microbial growth, microbial metabolism and microbial cell structure

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- **Microbial ecology:** The relationship between microorganisms and their environment.

- **Microbial genetics:** The study of how genes are organized and regulated in microbes in relation to their cellular functions. Closely related to the field of molecular biology.
- **Cellular microbiology:** A discipline bridging microbiology and cell biology.
- **Evolutionary microbiology:** The study of the evolution of microbes. This field can be subdivided into:
 - **Microbial taxonomy:** The naming and classification of microorganisms.

- Microbial systematic: The study of the diversity and genetic relationship of microorganisms.
- Generation microbiology: The study of those microorganisms that have the same characters as their parents.
- Systems microbiology: A discipline bridging systems biology and microbiology.
- Molecular microbiology: The study of the molecular principles of the physiological processes in microorganisms

- ***Infections by microorganism***

- may be caused by bacteria, viruses, fungi, and parasites. The pathogen that causes the disease may be exogenous (acquired from an external source; environmental, animal or other people, e.g. Influenza) or endogenous from normal flora e.g. candidiasis

- Direct contact - Touching an infected host, including sexual contact
- Indirect contact - Touching a contaminated surface
- Droplet contact - Coughing or sneezing
- Fecal–oral route - Ingesting contaminated food or water sources
- Airborne transmission - Pathogen carrying spores
- Vector transmission - An organism that does not cause disease itself but transmits infection by conveying pathogens from one host to another
- Fomite transmission - An inanimate object or substance capable of carrying infectious germs or parasites
- Environmental - Hospital-acquired infection (Nosocomial infections)