

Characteristics of Medical Microbiology and its Applications

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Commentary

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DESCRIPTION

Medical microbiology is a branch of medicine concerned with infectious illness prevention, diagnosis, and treatment. It's a large branch of microbiology that's used in medicine. Furthermore, this branch of science investigates diverse clinical applications of microorganisms for health enhancement. Bacteria, fungi, parasites, and viruses are the four categories of microorganisms that cause infectious disease, as well as one type of infectious protein known as prion.

Pathogens characteristics, modes of transmission, infection, and growth mechanisms are studied by a medical microbiologist. Medical microbiologists frequently serve as consultants to doctors, identifying microorganisms and recommending treatment choices. A treatment can be created using this information. Other responsibilities may include identifying potential community health hazards monitoring the evolution of potentially virulent or resistant microbial strains educating the public, and assisting in the development of health practises. They may also aid in the prevention or control of disease outbreaks and epidemics. Some medical microbiologists study non-pathogenic species to determine whether their characteristics may be used to develop antibiotics or other treatments.

Although the clinical side of the study focuses primarily on the existence and growth of microbial infections in persons, as well as their consequences on the human body and treatment options, those infections, epidemiology, the study of the patterns, causes, and effects of health and disease conditions in populations, is an important part of medical microbiology. In this regard, the entire field as an applied science can be conceptually divided into academic and clinical sub-specialties, despite the fact that there is a fluid continuum between the state of the art in clinical laboratories is dependent on continual developments in academic medicine and research laboratories, just as it is in public health microbiology and clinical microbiology.

Bacteria, viruses, fungus, or parasites are infections. The pathogen that causes the disease can be exogenous (i.e., acquired from the environment, animals, or other humans) or endogenous (i.e., influenza). The portal of entry refers to the point when a microorganism enters the body. The respiratory tract, gastrointestinal tract, genitourinary tract skin, and mucous membranes are all examples of these. A microbe's portal of entry is usually determined by how it gets from its natural home to the host.

Viruses, like other diseases, use various routes of transmission to enter the body, but unlike other pathogens, viruses must also reach the host's cells. The virus' genetic material (RNA or DNA) must be introduced to the cell once it has obtained access to the host's cells. The types of genes involved in viral replication differ a lot. The majority of DNA viruses assemble in the nucleus, whereas the majority of RNA viruses form exclusively in the cytoplasm.

The mechanisms through which a virus infects, multiplies, and persists in host cells are critical for its survival. Some illnesses, such as measles, have a method in which they must disseminate to a number of hosts. Because the illness is generally treated by the body's own immune response in various types of viral infection, the virus must propagate to new hosts before being killed by immunological resistance or host death. In contrast, some infectious agents, such as the Feline Leukemia Virus, can withstand immune responses and achieve long-term residence within a single host while still having the ability to propagate to subsequent hosts. Clinical presentation, such as gastrointestinal disease and skin infections, might help identify an infectious agent for a minor illness. Epidemiological considerations, such as the patient's likelihood of exposure to the suspected organism and the presence and abundance of a microbial strain in a population, must be examined in order to make an educated guess as to which microbe is causing the sickness.

Medical microbiology encompasses not only illness diagnosis and treatment, but also the study of beneficial bacteria. Microbes have been found to aid in the treatment of infectious diseases and the promotion of good health. Microbes can be used to generate treatments, as evidenced by Alexander Fleming's discovery of penicillin and the development of novel medicines from the bacterial species *Streptomyces*, among other examples.