

THE EMERGENCE AND DEVELOPMENT OF MICROBIOLOGY

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Abstract: In recent years, so much information has been collected in the field of microbiology that now it is divided into several branches, and these branches are on their own path of development. These include medical, veterinary, industrial or technical, agricultural, food microbiology, space microbiology, and others. Modern medical microbiology is a broad field, which, in turn, includes bacteriology (the study of bacteria), virology (the study of viruses), immunology (the study of the body's defenses against pathogenic and non-pathogenic microorganisms and those genetically foreign to the body). It is divided into such disciplines as mycology (studying the activity of fungi that are harmful to the human body), protozoology (studying the life activity of single-cell pathogenic simple animals).

Key words: microbiology, infectious diseases, measures, analysis results, morphological, biochemical, pathogenicity.

Microbiology (Greek: micros - small, bios - life and logos - teaching) is the science of small, simple, invisible unicellular organisms. This science studies the life activity of microbes, the laws of changes that occur in human, animal and plant organisms under their influence. Microbiology (Greek: micros - small, bios - life and logos - teaching) is the science of small, simple, invisible unicellular organisms. This science studies the life activity of microbes, the laws of changes that occur in human, animal and plant organisms under their influence.

In the special part, morphological, biochemical, pathogenic (disease-causing) characteristics of infectious disease agents, as well as laboratory detection, special treatment and preventive measures of this disease are analyzed. Medical microbiology performs an independent task based on the examination of a specific object. He studies the causes of the origin (etiology) of infectious diseases, methods of modern diagnosis, treatment and prevention, making perfect use of new information in general biology, epidemiology, hygiene, biochemistry and other sciences. Pathogenic microbes that have adapted to the human body in the process of evolutionary development and become disease-causing, are the object of medical microbiology. In nature, in addition to pathogenic microbes, there are also many saprophytic microbes that are very similar to pathogenic microbes in their appearance and some biological properties. Examples of this include cholera vibrios and cholera vibrios, anthrax bacilli with anthrax, or diphtheroids with streptococci. In this regard, if the rules of medical microbiology are strictly followed and the nature of each object is determined in time, it becomes easier not only to diagnose the disease, but also to develop measures to combat it.

Currently, viruses play an important role in the pathology of infectious diseases in humans and animals, because 75% of infectious diseases are caused by viruses, which harm the health of the population and damage the state economy. One of the main tasks of virology is the detection of diseases caused by newly discovered viruses, especially viral tumor diseases. Virology has been developing rapidly in recent years. One of the tasks facing scientists and virologists of various fields is to accurately and correctly diagnose viral diseases, develop methods of their prevention and treatment.

History and periods of development of medical microbiology

Microbiological research in Uzbekistan began in the 20s and 30s. In 1947, he studied microbiology at the Institutes of Zoology and Botany of the Academy of Sciences of Uzbekistan. was established. In the laboratory, studies were conducted on soil fertility improvement, silage preparation, wastewater treatment, and viral diseases of plants and insects. Research has expanded, especially after the establishment of the Scientific Research Institute of Microbiology of the Academy of Sciences of Uzbekistan in 1977. During this period, identification and study of the microflora of Central Asia (M. E. Mavloni), improvement of the quality of yeast used in winemaking (Kh. Abdurazzokova, N.B. Egamberdiyev, Sh. I. Hakimova), use of microorganisms in the preparation of fodder from plant residues and industrial waste (J. Toshpolatov, T. D. Jamolov), study of antagonistic relations between microorganisms and the antibiotics they produce, their use in plant protection, animal husbandry (S. A. Askarova, S. M. Hojiboyeva, M. Q. Qutliyev, S. B. Boriyev) and bacterial, fungal, and wide-scale research was conducted on diseases caused by viruses (Ye. T. Dikasova, M. I. Isamuhamedov, A. H. Vahobov). At the same time, work was carried out on the geochemical activity of microorganisms. The technology of microbiological extraction of elements from ores with low content of gold, copper and other elements was developed (P. T. Malakhova, M. F. Sagdiyeva). Treatment of waste water from agricultural and industrial enterprises using microbiological methods (J.Q. Qutliyev, R. Sh. Shoyokubov, S. B. Boriyev), using genetic and cell engineering methods, proteins, enzymes necessary for light and food industries, agriculture and pharmacology, biotechnologies of synthesizing vitamins, biological fertilizers, preparation of medicinal water were introduced (A.F. Kholmurodov, A.S. Rasulov, P.Yu. Yusupov, I.J. Jumaniozov, T.F. Gulomova, D.K. Ogay). Thanks to these studies, the importance of mycovirus in determining the variability of the disease-causing properties of the fungus in the virus-fungus-plant system was revealed (J. Safiyazov). The formation of physiologically active compounds in microorganisms and ways of controlling their development were studied. Local fungi that produce nicotinamide adenine dinucleotide (NAD) were discovered and some biochemical mechanisms of their synthesis were determined (A.F. Kholmurodov, T.G. Gulomova). The preparation of cellulolytic enzymes and the technology of obtaining nutrients rich in protein were developed (K. D. Davronov, 3. R. Akhmedova). Cyanobacteria-destroying phages were identified (M. M. Murodov). As a result of 50 years of research, a collection of regional microorganisms was created for the first time in Uzbekistan.

Microbiology has its own history, similar to other sciences. A few centuries before the emergence of scientific information about microbes, the processes related to their activity (ripening of grape juice, fermentation of milk and dough) were known to mankind, and people consciously prepared musalas, kizim, yogurt and other products. who used the

methods. Philologists and naturalists have been interested in the causes of infectious diseases since the early stages of the development of science. Hippocrates (460-377 BC) and Galen (131-211 BC) suspected that infectious diseases were caused by living organisms. Asian peoples considered leprosy to be contagious and recommended to keep away from the people who have this disease. The great scientist Abu Ali ibn Sina (980-1037) thought about infectious diseases caused by invisible living creatures and spread through water and air. The era of feudalism was characterized by the widespread spread of dangerous infectious diseases (smallpox, typhus, cholera, etc.) in Europe and Asia. However, many people died due to the lack of an effective scientific direction in the fight against epidemics, and the weakness of humanity's ability to fight against infectious diseases. Later, after overcoming the difficulties introduced by religious people, effective scientific research was started based on experiments. In the 16th and 18th centuries, when physics, chemistry, and medicine were developing in Western Europe, a lot of information was collected about the causes of infectious diseases. At the beginning of the 17th century, effective work was done in the field of optics, including the study of the magnification properties of crystal glasses. For the first time in 1590, Hans and Zachary Jansen made an instrument from crystal bottles and showed great skill. Galileo first invented a simple microscope in 1609-1610. The first to see and examine microorganisms under a microscope was the Dutch naturalist Antony-van Leeuwenhoek, who invented a microscope capable of zooming up to 160-300 meters. A. Levenhuk examined many rich objects in the environment, saw that there were living "animals" in them, drew their pictures and based on them published a book called "Secrets of nature discovered by Levenhuk". Thus, Levenhuk was the first to provide information about the world of microorganisms and laid the foundation for the creation of the department of microorganisms, which is considered the first stage in the development of microbiology (Fig. 1). Leeuwenhoek's discovery led to a lot of research.

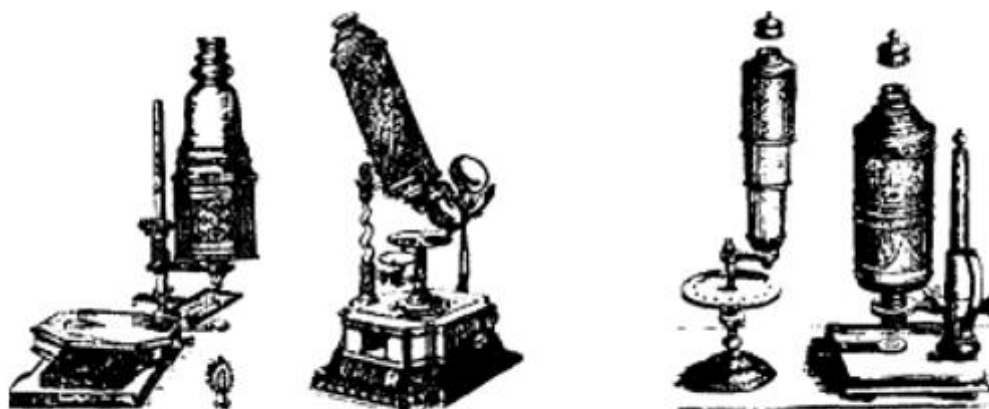


Figure 1. Examples of the first discovered microscopes

Despite the fact that his discoveries aroused great interest among scientists in his time, research in this regard was not carried out for a long time. Finally, after 150-200 years, it was discovered that various microbes are the causative agents of rotting, rotting and infectious diseases. In particular, the Russian scientist D.S. Samoylovich thought that there is a specific living microbe of the toun disease and that it is possible to fight against the disease when it is introduced into the body by weakening it. In solving problems focused on theoretical and practical issues of combating infectious diseases, D.S. Sam Aylovic's researches in the field of protection against the disease of toun gave great results. The

English doctor Edward Jenner (1749-1823) developed a vaccine to create immunity against this infection by inoculating people with cowpox virus. This method was also a very important innovation in the fight against infectious diseases. But until L.Pasterning's scientific research was introduced into science and life

The scientific nature of E. Jenner's discovery remained a mystery.

One of the great contributors to the development of microbiology is the German scientist Robert Koch (1843-1910). He improved the methods of microbiological examination, for the first time used the method of growing microbloom in a thick nutrient medium, as a result of which it was possible to isolate a pure culture of the microbe. He developed a method of examining micro-organisms under a microscope by staining them with aniline dyes (in 1877), managed to more fully identify micro-organisms, and introduced the immersion system in working with a microscope. Koch also introduced microphotography to microbiology. In 1876, as a result of improving working conditions with a microscope and perfecting the technique of microbiological examinations in general, he decisively solved the problem of the etiology of anthrax. Koch thoroughly studied tuberculosis, discovered its bacterium in 1882, and managed to isolate tuberculin from tuberculosis mycobacteria. Later, he went to places where cholera was more common, investigated the ways of the spread of this disease and found the cholera germ. R. Koch also developed a method for isolating a pure culture of a microbe. Koch's contribution to the development of microbiology is great, so he is considered one of the founders of microbiology.

Microbiology is the scientific field that deals with microorganisms, i.e. very small organisms such as bacteria, viruses, fungi and parasites. Their structure, vital activity and interaction with the environment are studied. Microbiology is important in the fight against infections in medicine, in the development of seeds in agriculture, and in the preservation of ecosystems in ecology. Also, microbiology is used in the production of new products in biotechnology, for example, in the preparation of medicines and food supplements. In general, microbiology contributes to a deep understanding of various aspects of life and is one of the important areas of modern science.

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