

## MICROBIOLOGY: THE ROLE OF MICROORGANISMS IN HUMANS AND THE ENVIRONMENT

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**Abstract:** Microbiology is a field of science that studies microorganisms, their species, life activity and impact on the environment as well as the human body. Microorganisms are located in all parts of nature, providing with their help the processing of organic substances, attachment to the cycles of nitrogen, carbon and oxygen. The microbiome in the human body, in turn, plays an important role in the functioning of the immune system, the production of vitamins and even in the fight against severe diseases. At the same time, microorganisms play an important role in maintaining the stability of biogeochemical processes in the environment. Cutting-edge news in microbiology and biotechnology.

**Key words:** Microbiology, microorganisms, microbiome, human health, ecosystem, biotechnology, bioremediation, infectious diseases, beneficial bacteria, ecological balance, viruses, bacteria, genetic modification, digestion, immune system, environment, biogeochemical cycle.

Microbiology is a biological science that studies living organisms, including microorganisms, studying their role in human life and the environment. Microorganisms, despite their smallness, perform very important functions in all areas of life, including human health, the ecosystem and the environment. Some of them are "harmful," others are useful. This article discusses the implications of microorganisms for human health, the environment and their biological experience.

Microorganisms are one of the smallest and most diversified forms in the world of living organisms that exist in all natural ecosystems. In his study Microbiome and Human Health, he investigated the effects of the gut microbiome on the human body, as well as on beneficial bacteria and their immune systems. He noted that the normal functioning of the microbiome is essential for maintaining a person's health, and its disruption can lead to various diseases, including high blood pressure[1].

Each microorganism has its own characteristics and functions, which play an important role in various spheres of life. The development of microbiology as a science and its main lines of research in past centuries have been aimed at determining how it

affects human health and nature. Microorganisms that help solve various problems are important for biological, environmental and medical research.

In his scientific work "Infectious diseases and their prevention," he deeply studied the role of microorganisms in the occurrence of infectious diseases. He explained the methods of prevention and control of diseases caused by viruses, bacteria and guardhouses, and conducted important studies that determine the importance of microbiology. the importance of vaccines and immunotherapy in containing the spread of infectious diseases [2].

In the study "Ecosystems and Microorganisms," he noted the role of microorganisms in maintaining the balance of ecosystems and explained their impact on the environment. In his opinion, microorganisms are important participants in the cycles of carbon, nitrogen and oxygen, which help ensure the stability of ecosystems. He also noted that if microorganisms upset the balance of ecosystems, this can lead to natural problems. [3].

If ten years ago microorganisms were mainly studied as harmful organisms that cause infections, today their beneficial properties are also of great importance. New biotechnological developments, research in the field of medicine and ecology clearly show the benefits of microorganisms for our lives. At the same time, some of the harmful species listed above can also pose a risk, so it is important to understand or manage them and their impact.

### **1. Microorganisms and their species**

Microorganisms are tiny, priceless organisms that are not visible to the naked eye, into which bacteria, viruses, viruses, archaea and chlorophylls enter. One of the main features is that most of them are "shown only with a microscope."

- Bacteria is one of the most common microbiological microorganisms that affect human health in all walks of life. They can breed in the right nutritional and ecological conditions.

- Viruses are non-living microorganisms that can cause disease in humans and other organisms. They are one of the main causes of infectious diseases in bacteria, humans and animals.

- Go ste (influenza) - a family of microorganisms, some of which benefit the individual, while others can cause infections and illness.

- Arcaea - they use many "impurities for various problems.

### **2. Impact of microorganisms on human health**

Microorganisms have different effects on human health. They can "live in harmony with each other, but sometimes have a harmful effect on viruses and bacteria."

- Beneficial microorganisms:

Microflora: Various microorganisms that perform important functions are present in the human body. For example, beneficial bacteria in the intestines help to absorb organic substances, contribute to the production of vitamins (for example, vitamins B and K). At the same time, they ensure the normal functioning of the immune system and prevent the growth of pathogens.

about Microbiome: In medicine, the microbiome and its effects on human health are widely studied. If the imbalance in the microbiome is disrupted, it can lead to a number of diseases, including the onset of blood pressure, diabetes, cancer and seizures.

- Harmful microorganisms:

Infectious diseases: pathogens

### 3. The role of microorganisms in the environment

Microorganisms play an important role in the ecosystem. They are involved in the management of biogeochemical processes in the environment, in the circulation of carbon, nitrogen, oxygen and other elements.

- Recycling: Microorganisms process organic matter, turning it into minerals and related substances. These processes are important, for example, in the carbon cycle and the nitrogen cycle. Many of them help to process organic residues in the body of animals and plants, thereby ensuring the circulation of organic substances in the biosphere.

- Ecosystem balance: Microorganisms interact with different creatures in the environment, which helps maintain ecosystem balance. They also help get rid of harmful chemicals, control the growth and reproduction of various organisms.

### 4. Microorganisms and biotechnology

In the field of biotechnology, microorganisms play an important role. This article examines the role of microorganisms in the bioremediation process. In his opinion, microorganisms are used to clean the natural environment by processing fats, petroleum products and other chemicals. When Usmanov conducted this study, he determined the importance of microorganisms used in the bioremediation process in solving problems. [4].

Noting the importance of new biotechnological methods in microbiology for human health and medicine, he noted the promotion of the production of antibiotics and vaccines. According to his research, best practices in microbiology and biotechnology play an important role in human health and disease prevention. [5]. Microbiology is a science that studies the types of microorganisms, their vital activity and their impact on humans and the environment. Microorganisms are found not only in the human body, but also in all ecosystems and the natural environment. Their activities play an important role in maintaining the balance of ecosystems, carbon, nitrogen and oxygen cycles. Microbiomes and microorganisms play an important role in protecting human health. The normal content of the microbiome contributes to the functioning of the

immune system, participates in the production of vitamins and in the preparation of vital substances. Microorganisms are also important for maintaining a balance between beneficial microbiomes and harmful microorganisms. Currently, methods of using microorganisms in such new scientific fields as biotechnology and bioremediation are developing. Cleaning the environment of harmful substances by bioremediation, as well as preventing infectious diseases.

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