

The **aim** of the study was to analyze all existing bacteria-based preparations for the treatment of oncogenic diseases and to prove the prospects for their use.

Materials and methods: analysis of scientific literature and results of advanced research in the field of microbiology and pharmacology.

Results and discussion. According to the literature, it has been established that since 70 years of the XIX century the following bacteria have been used in the treatment of oncogenic diseases: tularemia vaccine in the complex therapy of cancer of the uterus and lungs, BCG vaccine for prevention of relapse of gallbladder cancer and others.

Recent advances in genetic engineering make it possible to return to these studies.

According to the literature, more than 10 species of Gram-positive and Gram-negative bacteria have been identified, which can be potentially significant in the treatment of oncogenic diseases. These bacteria include representatives of different genera: Clostridium, Escherichia, Salmonella, Listeria, Bifidobacterium and others.

Clostridia is the most promising bacterial family. They are sensitive to antibiotics, have high proteolysis activity. These are anaerobic bacteria that live in oxygen-free conditions, and tumors have a very low percentage of oxygen, which causes the bacteria to search for the tumor. Living bacteria kill the tumor with their enzymes and then use the remains of the tumor as a source of nutrients. The immune system is activated, bacterial and cancer cells are destroyed.

Salmonella – their attenuated strains exhibit an induction immune response.

Listeria in live recombinant vaccines - activate antitumor immunity.

A promising area is the use of bacteria as vectors (carriers) of enzymes to tumors or as vectors - producers of therapeutically active substances (toxins).

E tumors that are completely resistant to bacterial therapy then need to use chemo and bacterial therapy together.

There are many studies using the simplest (trypanosomes) and fungi (trichoderma).

Conclusions. Analyzing all the above, we make the following conclusion: the use of bacteria in the treatment of oncogenic diseases is a promising area of experimental oncology.

PANDEMICS OF OUR TIME: THE EMERGENCE OF NEW INFECTIOUS DISEASES OR THE RE-EMERGENCE OF “OLD” INFECTIOUS DISEASES

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Introduction. The World Health Organization warned in its 2007 report that infectious diseases are emerging at a rate that has not been seen before. Since the 1970s, about 40 infectious diseases have been discovered, including SARS, MERS, Ebola, chikungunya, avian flu, swine flu and, most recently, Zika. With people traveling much more frequently and far greater distances than in the past, living in more densely populated areas, and coming into closer contact with wild animals, the potential for emerging infectious diseases to spread rapidly and cause global epidemics is a major concern.

Aim. To study the etiology and specifics of epidemiology of modern pandemics, the role of known and new infectious factors in their development.

Materials and methods. Analysis of the modern scientific literature and World Health Organization publications on the development of modern pandemics.

Results and discussion. Emerging infectious diseases are infections that have recently appeared within a population or those whose incidence or geographic range is rapidly increasing or threatens to

increase in the near future. Emerging infections can be caused by: previously undetected or unknown infectious agents; known agents that have spread to new geographic locations or new populations; previously known agents whose role in specific diseases has previously gone unrecognized; re-emergence of agents whose incidence of disease had significantly declined in the past, but whose incidence of disease has reappeared. This class of diseases is known as re-emerging infectious diseases. Additionally, there is the potential for diseases to emerge as a result of deliberate introduction into human, animal, or plant populations for terrorist purposes. These diseases include anthrax, smallpox, and tularemia.

There are many factors involved in the emergence of new infectious diseases or the re-emergence of “old” infectious diseases. Some result from natural processes such as the evolution of pathogens over time, but many are a result of human behavior and practices. Consider how the interaction between the human population and our environment has changed, especially in the last century. Factors that have contributed to these changes are population growth, migration from rural areas to cities, international air travel, poverty, wars, and destructive ecological changes due to economic development and land use.

For an emerging disease to become established at least two events have to occur – the infectious agent has to be introduced into a vulnerable population and the agent has to have the ability to spread readily from person-to-person and cause disease. The infection also has to be able to sustain itself within the population, that is more and more people continue to become infected.

Many emerging diseases arise when infectious agents in animals are passed to humans (referred to as zoonoses). As the human population expands in number and into new geographical regions, the possibility that humans will come into close contact with animal species that are potential hosts of an infectious agent increases. When that factor is combined with increases in human density and mobility, it is easy to see that this combination poses a serious threat to human health.

Climate change is increasingly becoming a concern as a factor in the emergence of infectious diseases. As Earth's climate warms and habitats are altered, diseases can spread into new geographic areas. For example, warming temperatures allow mosquitoes – and the diseases they transmit – to expand their range into regions where they previously have not been found.

A factor that is especially important in the re-emergence of diseases is antimicrobial resistance – the acquired resistance of pathogens to antimicrobial medications such as antibiotics. Bacteria, viruses, and other microorganisms can change over time and develop a resistance to the drugs used to treat diseases caused by the pathogens. Therefore, drugs that were effective in the past are no longer useful in controlling disease.

Another factor that can cause a disease to re-emerge is a decline in vaccine coverage, so that even when a safe and effective vaccine exists, a growing number of people choose not to become vaccinated. This has been a particular problem with the measles vaccine.

Conclusions. The development of vaccines and antimicrobial drugs and the remarkable eradication of smallpox had created hope that infectious diseases could be controlled or even eliminated. However, the current realization that infectious diseases continue to emerge and re-emerge (including the possibility of bioterrorism), underscores the challenges ahead in infectious disease research.

Now in microbiology and virology worldwide there is an active research is ongoing of a number of emerging and re-emerging diseases, including influenza, SARS and MERS, dengue, chikungunya, Zika, tuberculosis, and HIV/AIDS.

And on the agenda of mankind there was a new problem related to the coronavirus infection (COVID-19). This disease has been added to the list of emergent infections requiring immediate study.

New emergence and re-emerging infections require scientists to respond immediately and find innovative ways to tackle new diseases.