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МАТЕРІАЛИ XI ВСЕУКРАЇНСЬКОЇ НАУКОВО-ПРАКТИЧНОЇ КОНФЕРЕНЦІЇ СТУДЕНТІВ АСПІРАНТІВ ТА ВИКЛАДАЧІВ ЛІНГВІСТИЧНОГО НАВЧАЛЬНО-МЕТОДИЧНОГО ЦЕНТРУ КАФЕДРИ ІНОЗЕМНИХ МОВ

“TO MAKE THE WORLD SMARTER AND SAFER”

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SUMY STATE UNIVERSITY
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MATERIALS OF THE ELEVENTH ALL UKRAINIAN SCIENTIFIC PRACTICAL STUDENTS', POSTGRADUATES' AND INSTRUCTORS' CONFERENCE OF LANGUAGE CENTRE OF THE FOREIGN LANGUAGES DEPARTMENT

"TO MAKE THE WORLD SMARTER AND SAFER"

(Sumy, March 23, 2017)

SECTION 2 ADVANCEMENTS IN MEDICINE

INNOVATIONS IN MEDICINE

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Medicine does not stand still. Scientists are finding ways to treat increasingly complex diseases through innovations in medicine every year. Is innovation in medicine a good or bad thing? On the one hand, new methods of treatment do not require surgical intervention, long recovery and patient care. On the other hand, the old methods which helped most people are nearly forgotten nowadays.

In this paper, I'd like to show how important it is to update resources in such industry as medicine. All of us are quite aware of close connection of innovation in medicine and human health, how the work of new equipment can bring a person back to life within seconds. Medicine is the area that should develop every year, because human diseases increasingly embrace our body and become more resistant to various methods of treatment.

Biotechnology is gaining popularity and relevance in our time. More than 3000 genetic diseases are caused by a single replacement in DNA, a grandiose breakthrough in genetic engineering takes place with the help of CRISPR. Scientists plan to learn how to get rid of all the diseases and mutations for good. But consider the pros and cons of such an innovation. Cas9 is very accurate, like a DNA surgeon. CRISPR allows you to turn on and off the genes of living cells and study specific DNA sequences, besides accuracy, cheapness and ease of use. The CRISPR-Cas system is much more convenient. The function of the incision is taken by the Cas9 protein. The project allows for homologous recombination when similar or identical DNA regions exchange nucleotide sequences among themselves. However, all these medical applications have one drawback. They are limited to one patient and will die with him, if the scientists do not use them on reproductive cells. Unknown errors can occur in any part of the DNA and go unnoticed. All these prospects are opened thanks to the recent revolutionary discovery of the protein CRISPR-Cas9.

What is the working principle of such a protein? The virus inserts its genetic code into the bacterium. Bacteria try to resist unsuccessfully, but in most cases their protective mechanisms are too weak. But sometimes bacteria survive. Then they can activate their most effective antivirus system. They retain some of the DNA of the virus in their genetic code. When the virus again attacks, the bacterium creates an RNA copy from the DNA archive and forms the Cas9 protein. He scans the bacterium for virus interference. When there is a 100% match, it activates and cuts the DNA of the virus, making it useless, thus protecting the bacterium.

In 2015, scientists used CRISPR to remove the HIV virus from patients' cells and proved that it was possible. A year later they conducted another experiment with rats. The HIV virus was found in virtually all of their cells. The scientists injected CRISPR into their tails, and were able to remove more than 50% of the virus from the cells throughout the body. The UK government allowed scientists to change the DNA of human embryos for research purposes using the CRISPR system. In early February 2016, Chinese scientists conducted experiments on human embryos even before such studies were permitted in the UK. In April 2016, geneticists reported that they changed the genes of embryos to make them immune to HIV. They introduced a gene that occurs in people not susceptible to infection using CRISPR.

CRISPR is able to help in the treatment of blood cancer. Scientists can take samples of the tissues of the hematopoietic organ of the patient himself, correct the defective stem cells, free them from a fatal mutation, and then transplant them instead of looking for a bone marrow donor. A team led by oncologist Lu Yu introduced modified cells to a patient with aggressive lung cancer. The researchers removed the immune cells from the recipient's blood, and then disconnected the gene with CRISPR-cas9. The disabled gene encodes a PD-1 protein that "puts the brakes" on the immune response of the cell. Dr. Lu says that the treatment went smoothly, and that soon the participant will receive a second injection.

Thus, innovative developments reduce the cost of treatment. CRISPR gives us the means to edit our immune cells and make them the best hunters for cancer cells. The technology CRISPR/Cas9 is able to change the attitude of mankind to hereditary diseases. If

before they were either completely incurable, now it is possible to treat them "truly", that is to eliminate the very cause of the disease.

NANOTECHNOLOGY IN MEDICINE

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In today's world often facing humanity faces global problems. Significant help in solving various problems can provide nanotechnology. In some biology and other sciences often use them is crucial.

I have said that over the past few decades was found about thirty infectious pathologies. Among them we should mention AIDS, "bird flu" virus, Ebola and others. Every year millions worldwide are diagnosed new cases of cancer. Mortality from these pathologies is around five hundred thousand people a year.

Nanotechnology in medicine is of great importance for all humanity. The advantages of using advanced methods over traditional therapy are obvious. Nanotechnology in medicine mainly involves chemical effect on a particular disease by administering drugs. Examples of the use of nanotechnology in medicine are a lot. Thus, scientists have created a new class of particles. Nanoparticles endowed with unique properties of optical character. These elements, having a microscopic diameter can move freely through the blood system. To the surface liners attached antibodies. The purpose of the application of nanotechnology in medicine is the destruction of cancer cells. A few hours after the liner into the body, made an infrared light irradiation. Inside is the formation of a special power by which cancer cells and destroyed.

Scientists suggest that this and other nanotechnology in medicine will contribute to the development of operational and inexpensive diagnostic methods and eliminate abnormalities early. In addition, new developments in the field of drugs may permit repair damaged DNA structure.

Using nanotechnologies, science can provide personal immortality to people due to implementation in an organism of molecular robots. They will be able to prevent cell aging, reorganize