

determined using electrophoretic analysis in polyacrylamide gel. The chimeric protein is planned to be studied as a promising antitumor agent.

Keywords: fusion protein, human annexin A5, adenosine deaminase, *Escherichia coli*, promising antitumor agent.

It is known that phosphatidylserine (PS) can serve as a marker on the surface of a cancer cell, which makes it possible to distinguish it from normal cells and to carry out, if necessary, targeted delivery of various pharmacological agents to the tumor [1]. To realize the delivery of the pharmaceutical substance into the tumor, a molecular transporter capable to recognize the PS on the surface of the cancer cell is essential. Human AA5 can act as such conveyor, binding with high affinity mainly to PS [2]. AA5 can be cross-linked with anti-tumor proteins or enzymes to deliver them to the tumor.

Sufficient experimental findings collected to date allow to state that one of the key factors responsible for the formation of tumor microenvironment repressing anticancer immune response is accumulation of extracellular adenosine [2]. In our opinion, it is possible to eliminate adenosine (protecting the tumor from host immunity) with the aid of a chimeric protein containing ADase and AA5 domains. The resulting chimeric protein introduced into the body of patients suffering from cancer diseases will bind with tumor cells and decompose adenosine protecting these cells from immune response.

This study was aimed at engineering of *E. coli* strain producing protein made up by human AA5 and ADase.

At the first stage of the research, the genetic construction of the vector was accomplished by inserting the AA5 and ADase genes into the plasmid. The resulting plasmid was transferred into *E. coli* BL21 (DE3) cells and bacterial biomass was obtained.

At the second stage, the chimeric protein was isolated and purified from cell biomass by affinity chromatography on Ni²⁺-NTA resin.

At the third stage, ADase activity was determined *via* the rate of adenosine transformation into inosine.

As a result of the study, a new recombinant strain *E. coli* AA17 was constructed as a source of chimeric protein of the above-mentioned structure with molecular weight of 73,8 kDa, which corresponds to the theoretically calculated value. At the same time, 18 mg of purified protein was produced from 1 liter of cultural liquid. The protein content was about 7 % of the total cellular proteins determined using electrophoretic analysis in polyacrylamide gel.

Summing up, the bacterial strain producing chimeric protein consisting of human annexin A5 and bacterial adenosine deaminase was designed by recombinant DNA technology. Such protein has to "pull out a brake" from the human antitumor immunity and can serve as a highly effective drug for therapy of a wide range of oncologic diseases.

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ANALYSIS OF MORBIDITY OF THE POPULATION OF THE REPUBLIC OF BELARUS FROM ALCOHOLISM IN 1995-2015

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Excessive alcohol consumption in most cases is a major cause of serious diseases and social problems. The problem of alcoholism significantly affects the health and the welfare of the population. Due to high levels of alcohol consumption in the Republic of Belarus is carried out to search for new measures to prevent alcoholism.

Keywords: alcoholism, diseases, analysis, tendencies.

Today the problem of alcoholism remains relevant both in the Republic of Belarus and throughout the world. Excessive consumption of alcohol in most cases is one of the main causes of serious diseases and social problems. Republic of Belarus refers to countries with a high level of alcohol consumption and problems of alcoholism.

The purpose of the work is to analyze the incidence of alcoholism in the population of Belarus in 1995–2015.

The subject of the study is the data on the incidence of alcoholism among the population of the Republic of Belarus in 1995–2015. In the work, a retrospective analysis of morbidity indicators was carried out, dynamics was analyzed and main trends were determined. The statistical processing of the obtained data and the graphical construction of the diagrams were completed using statistical packages of the application programs Statistica and Microsoft Excel 2010.

There is an annual increase in the primary incidence of alcoholism from 1995 to 2006, when the maximum number of newly diagnosed cases of alcoholism was recorded. Since 2007, there has been a decrease in the number of patients with a first-time diagnosis of alcoholism, but the level at the end of the study period remains higher than at the beginning.

In the structure of the incidence of alcoholism, about 70 % of the cases are men. Over the past few years there has been a slight decrease in the proportion of the female population in the overall pattern of morbidity.

To identify territorial differences, a comparative analysis of the incidence of alcoholism in the regions of the Republic of Belarus was conducted. The highest incidence of alcoholism in 2015 is noted in Grodno region.

Nowadays, we can observe a marked tendency to reduce the incidence of alcoholism (which is more pronounced in the last decade). This may be due to the influence of external socio-economic factors and the implementation of preventive and recreational activities aimed at reducing alcohol consumption and promoting healthy lifestyle.

EPIDEMIOLOGICAL ASPECTS OF DONORSHIP. SAFE BLOOD TRANSFUSION IN THE REPUBLIC OF BELARUS

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Literary sources on the epidemiological aspects of donorship and safe blood transfusion in the Republic of Belarus were analyzed and studied in this work. Current data on the role of donorship, blood and its components, as well as the risk of disease of recipients is presented. Particular attention is paid to the issues of arthropod-borne infections. Positive changes in donors who donate blood on a regular basis were identified.

Keywords: blood, blood transfusion, blood components, donorship, arthropod-borne, isesorology of blood, blood groups.

While the research, the characteristics of blood donorship and its components in the epidemiological aspect in the world and in the Republic of Belarus were studied, the ways to improve the efficiency and safety of donorship in the Republic of Belarus were identified.

Transfusion of blood components is an integral part of high-tech and specialized medical care in multi-purpose hospitals.

The current stage of the development and advancement of medical technologies is characterized by the increase in demand of medical and preventive institutions in the donor blood and its components. In the Republic of Belarus, complex high-tech surgeries have been performed more often, which requires the use of a large number of transfusion facilities. Introduction of modern methods of treatment (transplantation of liver, heart, kidney, bone marrow, high-dosage chemotherapy, coronary artery bypass grafting, etc.) changes the nature of transfusiological care for patients. Thus, donorship of blood and its components is one of the most important and basic factors for the development of high-tech medical care.

Improvement of approaches to donor organizations is becoming especially important. Introduction and development of modern methods of donorship activation search for new approaches to participation in activities to attract donor personnel and improve the level of infection security of the blood and its components are the task of prime importance of the development of transfusion medicine all over the world.

Donorship is intended to ensure the development and effective functioning of many branches of clinical medicine. As far as with the development of medical technologies, the need for donor blood and its components increases, insofar emerges the necessity to improve the approaches to donorship organization as well as when making managerial decisions in the work of the blood service. It is donors who are the main and most valuable resource of blood service. This means that working with them is just as compulsory as the solution of donor-related technological issues or the training of transfusion physicians.