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IMMUNOSTIMULATION AS ONE OF WAYS OF USING MICROORGANISMS IN MEDICINE

The antigenic load on the population of the Republic of Belarus and the whole world is constantly increasing. Particularly acute, this problem became more severe due to the deterioration of health of the population after the rapid industrial growth and the reduction in the ecological quality of the environment.

Currently, this problem is becoming increasingly important due to the fact that one of the main means to combat bacterial pathogens – antibiotics – rapidly reduces its effectiveness. Bacterial agents mutate rapidly, thereby acquiring resistance to most modern antibiotics. In connection with the above-described facts relevant learning and discovering new ways to combat bacterial pathogens are beyond doubt.

This issue is also important because the level of immune protection of the population in a number of generations is gradually decreasing due to the negative environmental impact. One of the most rapidly developing and promising directions in this field is immunostimulation. It allows you to improve the human immune system and thereby contribute to its opposition to the antigenic load.

One of these tools is a specialized plasmid of American company «ColeyPharmaceuticalGroup» (CpG) Synthetic product oligodeoxynucleotide contains unmethylated motifs of the CpG, which act as a powerful immune stimulant and can be used to improve the body's immune response.

The purpose of work is to draw the attention of young scientists to one of the possible ways to solve the problem of inefficiency of modern medicine, as well as a demonstration of the possibilities of using the microorganisms ability to obtain drugs without the need of complex and financially costly multi-step chemical syntheses.

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IMMUNOPHENOTYPIC FEATURES OF B-CELL NON-HODGKIN'S LYMPHOMS

Nowadays medical research in the field of B-cell non-Hodgkin's lymphoms develops in a rapid pace.

The occurrence of this type of lymphomas is often associated with changes in the environment. Lymphomas are detected mostly in agricultural workers, people who are in contact with pesticides, various fertilizers, solvents.

The research of the immunophenotypic and morphologic features of B-cell non-Hodgkin's lymphomas is a key issue, because it is the basis of the diagnosis and prognosis of this disease.

Non-Hodgkin's lymphomas are group of histologically and biologically heterogeneous malignant tumors of the lymphoid system. B-cell lymphoproliferative tumors are characterized by uncontrolled production of B-lymphocytes cell structures, which are normally engaged in immune activity.

The immunophenotyping is based on the analysis of specific protein markers on the surface of the lymphocytes or inside them. They are called clusters of differentiation and are denoted by index abbreviated as "CD" with their identification numbers.

Among all of the peripheral non-Hodgkin's malignant lymphomas the most common is diffuse large B-cell lymphoma. The disease is characterized by high aggressive and dynamic growth, without an adequate treatment the metastatic lesion of an organism can lead to death. Diffuse large B-cell lymphoma includes: primary mediastinal large B-cell lymphoma, T-cell/histiocyte rich large B cell lymphoma, anaplastic lymphoma kinase-positive diffuse large B-cell lymphoma.

Primary mediastinal large B-cell lymphoma is 6-10% of the total number of diffuse lymphomas, one of the most aggressive types of large b-cell lymphoma and it is characterized by rapid growth. Pathological cells express CD19, CD20, CD79a antigens. The CD5 and CD10 antigens expression isn't observed. The expression of CD30 is marked in many cases. Tumor cells express common leukocyte CD45 antigen, CD23 antigen, which is rarely found in other variants of diffuse lymphomas.

T-cell/histiocyte rich large B-cell lymphoma has an aggressive course and is often diagnosed at a common stage with involving cancer of the bone marrow. Pathological cells express CD45 and B-cell differentiation markers CD20, CD79a and PAX-5. In most cells there is lack of expression of CD10, CD15 and CD30. There is also expression of mature T cells markers – CD2, CD3, CD5 and CD7; most of them are CD8+. Different number of CD68+-reactive histiocytes has been identified.

Anaplastic lymphoma kinase- positive diffuse large B-cell lymphoma is characterized by the formation of large tumor clusters, which according to their macro- and microscopic characteristics resemble carcinoma or melanoma. ALK does not have B- and T-cell markers, do not express CD30 and CD45. Cells express cytoplasmic granular type ALK and CD138 antigens of cells plasma. Malignant cells may express cytoplasmic IgA (rarely IgG), CD4, CD43 and CD57.

Five-year survival in cases of large-cell lymphoma is 85% now for the early stages, but only 26% for the last stage. The main aspect of these indicators is the timely diagnosis of the disease. Research in this field is the most important, because

treatment and the further prognosis of the patient's life depends on the quality of diagnostics directly.

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ANTIOXIDANT PROPERTIES OF CITRUS FRUITS JUICE

High concentration of free radicals in the body is one of the major risk factors of developing cardiovascular and oncological diseases and other pathological conditions. Flavonoids are powerful antioxidants which can be used in the prevention of various diseases. Naringin and hesperidin are one of the most common flavonoids that can be found in citrus fruits. These flavonoids display the unique ability to increase elasticity and capacity of blood vessels. Thus, these flavonoids can be employed in the prevention of cardiovascular diseases. These flavonoids also enhance the work of the liver and produce anti-inflammatory effect. Hesperidin is contained in oranges, tangerines, lemons and limes. Moreover, lemons and limes contain eriocitrin which is similar to hesperidin in its structure and properties. Naringin can be found in grapefruits. All of these flavonoids have similar structure – they have a glycoside that can enhance their antioxidant properties because of additional OH-groups. We used freshly squeezed orange, tangerine, grapefruit, lemon and lime juices to analyse the antioxidant properties (AP) of these flavonoids. Moreover, we also compared the properties of freshly squeezed orange and grapefruit juices with that of packaged orange and grapefruit juices from different manufacturers.

The method of the AP detection in relation to reactive oxygen species (ROS) is based on the measurement of the oxidized compound fluorescence intensity and its reduction due to ROS. We used fluorescein which is a compound with high extinction coefficient and fluorescence quantum efficiency close to 1 for the detection of free radicals. Free radicals were generated using the Fenton system with hydroxyl radicals generated in the reaction of Fe²⁺ complexes with ethylenediaminetetraacetic acid (EDTA) and hydrogen peroxide.

The relationship between fluorescence intensity of fluorescein and juice concentration logarithm was analysed for each sample with juice concentration of 0.01–10%. Orange juice exhibited the highest antioxidant activity; its fluorescence recovery was 78% with 2% juice concentration. AP of grapefruit juice and tangerine juice were somewhat lower: ROS activity was reduced to 61% and 52% respectively. Fluorescence recovery for lemon and lime juices was 44–45% with 0.2% juice concentration. Packaged orange juice and grapefruit juice had the lowest AP in comparison with freshly squeezed juice with fluorescence recovery of 47–56%. IP50 values (juice concentration with 50% of free radical inhibition) were presented in graphic form.