The aim: to review scientific literature on DNA vaccine technologies and prospects for the use of DNA vaccines in the therapy autoimmune and oncological diseases.

DNA vaccine (gene vaccine) is a genetically engineered design that, once injected into a cell, produces pathogen proteins, thereby inducing both cellular and humoral immune responses. DNA vaccine is a vector with embedded cDNA of tumor antigen (autoantigen) with a powerful promoter that provides long-term expression of transgenes. The composition also includes auxiliary elements that guide the development of the immune response (genes of cytokines and chemokines that form both the innate and adaptive immune response).

After injection of DNA vaccine, nucleic acid by endocytosis penetrates into the cell and forms an endosome. DNA leaves the vesicle and enters the nucleus. There is transcription of the encoded antigen in the nucleus, and then protein syntheses and release of the cytoplasm. Antigenic peptides in complex with the molecule of the main histocompatibility complex I and II are expressed on antigen presenting cells (APC). APC, carrying the antigen, are sent to the lymph node, where they activate the B and T cells. Internal elements of plasmid DNA activate innate immune responses, thereby enhancing adaptive immune responses against expressed antigens.

The researches were focused primarily on assessing the safety and immunological response of DNA vaccines in 2009-2019 years. Vaccines against breast cancer (NCT02348320 and NCT0215705), cervical cancer (NCT02172911), ovarian cancer (NCT01322802 and NCT0302961) and pancreatic cancer (NCT03122106) were tested [1]. A vaccine against cervical dysplasia VGX-3100, which has already passed the 1st phase of clinical trials, has been developed. Most of the research is devoted to preventive immunization with DNA vaccines against human papillomavirus. Clinical trials of DNA vaccines against human cytomegalovirus have provided in 2019 [2]. DNA vaccine HER2/NEU V930 was demonstrated intensive humoral and cellular immune response without immune response against vaccine [1].

Modern generations of DNA vaccines are becoming more immunogenic, but there is a need to use the immunestimulants. Currently, it is experimentally proved that the use of a special vector (pCI/pins) causes a reaction on the part of Treg cells and control over autoreactive effector CD8+T cells [3].

DNA vaccines are characterized by selectivity, no risk of virulence reversion, high stability, safe-using and they have no side effects. In the ecological aspect, DNA vaccines production does not have a detrimental impact on the environment.

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PIZOOTIC MEASURES AS A FACTOR FOR PREVENTION OF INFECTIOUS DISEASES AMONG THE INHABITANTS OF MINSK ZOO

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Keeping large numbers of animals in limited areas is always a concern in terms of infectious pathology. The only way to counteract this is through the use of modern means of active immunization and adheres to veterinary and zootechnical standards of feeding and animal husbandry.

Keywords: wildlife, infectious diseases, zoo, anthropoposonosis, epizootic welfare, preventive measures.

Infectious diseases represent a socio-economic problem for many countries of the world. Currently, about 500 infectious animal diseases are registered, 200 of which are zooanthroponoses (a group of infectious and invasive diseases common for animals and humans). Over the past 30 years, about 100 infectious diseases have been diagnosed in the Republic of Belarus, more than 40 of which are common for animals and humans. The number of infectious diseases registered in Belarus is constantly increasing. For example, over the last 15-20 years about

20 new infectious diseases have been diagnosed in Belarus (bovine spongiform encephalopathy, pigs' cycro-virus infection, reproductive-respiratory syndrome, highly pathogenic avian influenza, etc.).

Taking into account the special danger of infectious diseases, veterinary specialists carry out a set of measures to prevent them on the territory of our country.

Cooperation of Belarus with neighboring states and international organizations during the introduction of restrictive measures (ban on the importation into the country of animals, products of their slaughter from particularly dangerous diseases, fodder and their components) helps to avoid the emergence of exotic infections. Customs control over products and raw materials of animal origin entering the Republic of Belarus, their examination for the presence of animal proteins with the help of PCR allows to a certain extent to prevent the occurrence and spread of especially dangerous diseases on the territory of our country. Besides, in the republic there is a normative-legal base regulating the activity of veterinary specialists on prevention and elimination of diseases [1].

Zoos as scientific-educational institutions, where animals are constantly "moving" in terms of their elimination on the territory of other zoos, inflow of new groups and species of animals to the place of the departed ones, were not left aside with their inhabitants. Such relocation requires from the veterinary service (in particular, the Minsk Zoo) constant, daily painstaking work on the preservation of epizootic well-being at the object entrusted to them [2, 3].

The huge variety of animals and birds, their concentration on a relatively small area, the aviary type of their content increases the possibility of infection. Taking into account that the territory of the zoo is visited by hundreds and thousands of visitors every day, this risk increases.

Clear schemes of anti-epizootic measures with the use of highly immune vaccines in combination with the observance of sanitary and zootechnical measures allow the inhabitants of the zoo to be in a physiologically healthy form. In support of this we can mention the fact that the majority of the inhabitants of Minsk Zoo regularly give healthy and viable offspring.

Thus, the Republic of Belarus has developed and implemented a number of preventive measures to prevent a number of particularly dangerous infectious diseases of animals.

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ANTIOXIDANT ACTIVITY OF NEW SYNTHESIZED PYRIMIDINE DYES

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Investigation of drugs that are close to structure of natural pyrimidines plays a leading role. Nowadays, studying of the physical and chemical properties of pyrimidine compounds for medical purposes is perspective field for pharmacological studies, which is based on a wide range of pharmacological activity of these organic compounds: antibacterial, antifungal, antitumor, antioxidant, and cardioprotective.

Keywords: pyrimidine, radicals, antioxidant, orbitals, HOMO, LUMO.

The majority of heterocyclic compounds are synthesized in laboratory conditions, as they have a wide spectrum of biological activity. Pyrimidine derivatives are synthetic exogenous antioxidants that are synthesized directly in the laboratory and introduced into the body.

Antioxidant activity is due to the ability of pyrimidine compounds to neutralize atoms, molecules or ions with unpaired electrons on the outer shell, i.e. ability to neutralize radicals. Free radicals are formed under the influence of various physicochemical factors, as well as the products of certain reactions inside the cell, and play an