

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

important role in various processes such as lipid metabolism, peroxidation, gluconeogenesis, electron transfer in the respiratory chain, and also provide protection against many microorganisms and play a significant role in the regulation of blood pressure. However, a high concentration of free radicals in the cell leads to numerous damages to its components from the cell membrane to nuclei acids and proteins, which can lead to the development of serious diseases

To compare the antioxidant properties of molecules (table 1), electronic properties were calculated by the non-empirical method of the theory of the density functional B3LYP/6-31G** in water as a solvent.

Table 1

Properties	Molecule 1	Molecule 2
E_{HOMO} (eV)	-5,71	-5,44
E_{LUMO} (eV)	-1,36	-1,63
E_{g} (eV)	4,35	3,81

According to the calculations, molecule 1 – (4,6-dimethylpyrimidin-2-ylamino)(5-p-tolyloxazol-3-yl)methanol and molecule 2 – N-(4,6-dimethylpyrimidin-2-yl)-5-phenylisoxazole-3-carboxamide both considered to have high antioxidant activity. Molecule 1 possesses less HOMO-energy (-5,71) and that is why it is stronger than molecule 2 in electron acceptance which means first molecule has less expressed antioxidant activity. The most important property of compounds expected to be an antioxidant is the energy gap between HOMO and LUMO orbitals. The energy gap of first pyrimidine structure is 4,35 eV, and the energy gap of second compound is 3,81 eV. Thus, we can conclude that N-(4,6-dimethylpyrimidin-2-yl)-5-phenylisoxazole-3-carboxamide has stronger antioxidant properties in comparison with (4,6-dimethylpyrimidin-2-ylamino)(5-p-tolyloxazol-3-yl)methanol.

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CHEMILUMINESCENT ACTIVITY OF RAT PERITONEAL MACROPHAGES

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The chemiluminescence of peritoneal macrophages is a method for quantification and analysis of various macromolecules involved in oxidative stress and pathological processes in the body and accompanied by releasing of active oxygen forms and highly reactive radicals what is important for diagnosis of diseases.

Keywords: chemiluminescence, peritoneal macrophages, rat, forbol-12-myristate-13-acetate.

The most common approaches of chemiluminescence assessment are enhanced chemiluminescence with a special substance (luminol) increased the signal as a result interactions with specific forms of free radical substrates or/and induced chemiluminescence caused by the action of inductors, f.e. forbol-12-myristate-13-acetate (PMA) triggered specific metabolic cascades to the synthesis of reactive oxygen species or organic free radicals [1, 2].

The spontaneous and induced chemiluminescence was investigated in peritoneal macrophage isolated from laboratory rats (n = 10, body weight 270– 320 g) on day 5 after intraperitoneal injection of 3,0 % thioglycol medium solution in total volume of 5 ml. The collected peritoneal exudate was centrifuged at 1500 rpm for 8 minutes, cell suspension was seeded in culture medium RPMI-1640 containing 10 % fetal bovine serum, 2 mM L-glutamine, 1 % antibiotic-antimycotic ("Gibco," UK) and cultivated 2 h at 37 °C and 5 % CO₂. Attached cells were scraped off Petri dishes and their luminol-depended functional activity was assessed in the presence or absence of PMA as stimulator.