metabolites – nitrites (NO_2^-) and nitrates (NO_3^-). L-Arginine to L-citrulline converting in a reaction catalyzed by NO-synthase (NOS) is one of the ways of NO synthesis. The increase of this enzyme activity and the content of NO stable metabolites lead to an increase of free radical induced processes and to the progress of nitrative stress in leukocytes. The purpose of the work was to investigate indices that characterized nitrative stress in leukocytes under type 1 diabetes mellitus. The research was conducted using rats` leukocytes with and without stimulating by tripeptide fMLP during 30 seconds, 1 and 5 minutes.

It was shown that the activity of inducible NO-synthase (iNOS) is increased in approximately 1.4 times under diabetes condition in rats` leukocytes in comparison with control. However, in the case of stimulation for different time the activity of this enzyme was practically unchanged, both in control and under diabetes mellitus. This may indicate an inadequate response to bacterial tripeptide of pre-activated leukocytes under the conditions of this pathology.

One more way to assess NOS activity and NO content is to define the content of its stable metabolites – NO_2^- and NO_3^-. It was found that the level of nitrate anions increases under diabetes condition compared to control. However, there is no reliable changes in the level of nitrate anions under normal or pathological conditions after stimulation. It was shown that fMLP stimulation of leukocytes tends to decrease the level of nitrites in control, but increase the content of nitrites under diabetes condition at 30 s and 1 min of stimulation.

During the experiment, it was found that fMLP stimulation increase the level of arginine under experimental diabetes at all time points compared to control. This may lead to an intensification of the process of NO formation from L-arginine and increase of NO-synthase activity, which may eventually induce the development of oxidative-nitrative stress.

The obtained results showed that there is an increase of inducible NOS activity and the content of NO stable metabolites, in particular nitrate anions under type 1 diabetes mellitus. Also it was established a reliable increase of the arginine and nitrite anionslevels after fMLP stimulation under pathological conditions. Therefore, it leads to the rise of free radical generation and progress of oxidative-nitrative stress in leukocytes under type 1 diabetes mellitus.

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COMMUNICATION OF SUPEROXIDE DISMUTASE, CATALASE, REDUCED GLUTATHIONE WITH ANTIOXIDANT PROCESSES DURING HUMAN AGING

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Aging is the result of normal development and metabolic processes. Despite the abundance of mechanisms underlying aging, there can be relatively less complex phenomena such as longevity genes or antioxidant systems protecting the body that control the rate of aging. Many of the experimental data that are currently available indicate the role of oxyradicals in aging processes. Free radicals have been linked to the pathogenesis of various diseases such as cancer, diabetes, cardiovascular disease, autoimmune diseases, neurodegenerative disorders and are involved in the aging process. Some antioxidants, including superoxide dismutase, catalase and glutathione reductase, have been recognized as pharmacologically active factors for the aforementioned diseases. That is why it was necessary to find out if the activity of antioxidants depends on the health and age of the patient. [Benzi,1989; Koltas 2016; Garcia, 2017]

We investigated the activity of catalase (CAT), superoxide dismutase (SOD) and the content of reduced glutathione (GSH) as characteristic components of the human antioxidant system. The whole blood and plasma of 70 people aged 65-70 years before and after antioxidant therapy were studied.

It was shown that the state of health affects the activity of catalase and superoxide dismutase: there is a difference between their activity before and after therapy: the range of activity of catalase has changed from (886-920 U / ml) to (834-1014 U / ml), and superoxide dismutase - from (4.5-7 U / l) to (5.8-11.5 U / l), respectively. Antioxidant therapy and improvement of the health status had no effect on the concentration of reduced glutathione.

Consequently, the activity of catalase and superoxide dismutase can serve as a marker for the effectiveness of antioxidant therapy and shows their promise in assessing the health of patients. Regarding the content of reduced glutathione, further studies should be carried out to change the experimental conditions by additional administration of L-glutamic acid, which serves as a substrate for the synthesis of GSH *de novo*.

Lavrienya D.

ABOUT THE EFFECTIVENESS OF ELECTROPHORESIS AS THE METHOD OF EXSTRACTING PEPTIDES OF VENOMS OF SOME ACULEATA SPECIES

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The aim of the study was to establish the composition of the venom for the separation, identification and determination of the major constituents of bumblebee and yellow jacket (Family: Vespidae, Apidae).

Among the Hymenoptera that produce venom the social wasps and bees are most familiar to men. Due to their complexity and diversity, animal venoms had represented an extensive source of bioactive compounds, such as peptides and proteins.

Studying of the chemical composition of bumblebee and yellow jacket venom began relatively recently. Due to the use of chromatographic methods of compounds separation and identification several venom fractions were isolated and within those studies. The venom consist of various chemicals of active amines, peptides and proteins including different hydrolases (including proteases, hyaluronidases, phosphatases, nucleotidases and phospholipase A2) as well as allergens and high molecular weight neurotoxins [Hopkins, 2007].

Vespid venom, in general, produces prolonged pain and local edema an increase in permeability of the blood vessels in the skin [Roger, 1978]. The pain often continues for several hours and itching lasts for days. Vespid venoms contain biologically active amines such as serotonin, histamine, tyramine and catecholamines [Roger, 1978]. Although active amines can be the major pain-producing principles in the venoms, their concentrations differ greatly between wasp species. The data suggested that most of the species of *Vespa*, *Paravespa*, *Dolichovespula* and *Polistes*, contains serotonin and histamine as the major active amines in the venom [Konno, 2016].

There are three major components of bumblebee venom: bombolitin, phospholipase A2 and a serine protease, with bombolitin being the most abundant. Bombolitin had been first discovered in venom from another bumblebee, *Bombus pennsylvanicus*, and they show structural and biological peptides similar to those of mellitin [Moreau, 2013]. Bombolitine have been identified from another bumblebee species, *Bombus lapidarius* [Favreau, 2006].

For analysis we used venoms from insects which had collected in the summer period 2017. Venom had obtained from individual alive insects such as: *Bombus pascuorum*, *Bombus lapidarius*, *Bombus terrestris*, *Bombus sylvarum*, *Vespula vulgaris*, *Vespula germanica*, *Apis mellifera*, *Bombus humilis* and *Bombus derhamellus*. Determination of molecular masses of proteins and peptides within the venom allows determining the features of their composition.

Two-dimensional polyacrylamide gel electrophoresis is a useful method to resolve and separate proteins in biological specimens. In non-equilibrium pH gradient electrophoresis fol-