

**МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ  
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ»**



## **МАТЕРІАЛИ**

**104-ї підсумкової науково-практичної конференції  
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further research in the direction of determining the main factors that contribute to the growth of these indicators.

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## **NEPHROTROPIC EFFECTS OF EMOXIPINE UNDER THE CONDITIONS OF CHRONIC HYPOXIC HYPOXIA**

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**Introduction.** Free radical oxidation is the most important regulator of lipid and protein metabolism. The result of the intensification of free-radical oxidation, conditions for which are created even in hypoxia, is an increase in the content of its primary, secondary and final products, which are powerful pro-oxidants that intensify free-radical oxidation with the development of the «snow avalanche» phenomenon. However, the influence of hypoxia on numerous physiological and biochemical processes in tissues and cells is twofold and directed opposite. The most promising drugs for the correction of hypoxic conditions are antihypoxants – drugs capable of smoothing the energy deficit and preventing the destruction of cell membranes by free radicals using various mechanisms. Emoxipine, a derivative of 3-oxypyridine, attracts special attention in this matter.

**The aim of the study** was the effect of emoxipine on the processes of lipid peroxidation and the activity of the antioxidant system in the blood plasma of adult male white rats under the conditions of chronic hypoxic hypoxia.

**Material and methods.** The study was conducted on white laboratory outbred male rats of reproductive age weighing 140-180 g, which were kept on a standard balanced diet with free access to water. The animals, previously selected as moderately resistant to hypoxia, were divided into 3 groups (n=7): the first group consisted of intact animals, the animals of the second group were exposed to chronic hypobaric hypoxia. Hypobaric hypoxia was simulated in a modified flow-through pressure chamber imitating the ascent of rats to an altitude of 4000 m above sea level at a speed of 24 km/h. The animals were kept at this altitude for 2 hours daily for 2 weeks, hypoxia sessions were carried out in the morning. After the last session of hypoxia, the animals of the third group were given a single injection of emoxipin intraperitoneally at a dose of 100 mg/kg. Animals were slaughtered by decapitation under light ether anesthesia. The state of lipid peroxidation was studied by the content of malondialdehyde, and the antioxidant system – by the activity of glutathione peroxidase in the blood plasma of rats.

**Results.** The use of emoxipine under the conditions of chronic hypoxia contributed to a 1.6-fold decrease in the content of malondialdehyde in the blood plasma of rats compared to animals exposed to hypoxia, which indicates the ability of emoxipine to reduce the intensity of lipid peroxidation in kidney tissue through the effect of «quenching» radicals, because the action of emoxipin is aimed at the processes of free radical oxidation in biomembranes and inside cells. Taking into account that free radical products are substrates of antioxidants, it can be argued that an excessively high level of active forms of oxygen, in addition to directly attacking enzymes of antioxidant protection, is able to reduce their activity, as well as any other enzyme according to the principle of reverse inhibition by the substrate. The results of the experiment confirmed that the introduction of emoxipin during chronic hypoxia led to 1,5-fold increase of the activity of glutathione peroxidase in the blood plasma of rats.

**Conclusions.** Thus, the use of emoxipine under the conditions of chronic hypoxia limits the destructive effect of lipid peroxidation products and activates the enzymatic antioxidant system in the blood plasma of rats. Such a prominent antioxidant and membrane-protective potential of emoxipin can be associated with its pronounced ability to contribute to the stabilization of biomembranes of cells, the preservation of their orderly structural and functional organization, necessary for the functioning of membrane-bound receptor complexes, enzymes and ion channels.