

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



## **МАТЕРІАЛИ**

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## **ADAPTIVE-COMPENSATORY REACTIONS OF THE ORGANISM IN PATIENTS WITH ARTERIAL HYPERTENSION AND CHRONIC KIDNEY DISEASE**

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**Introduction.** Arterial hypertension (AH) is one of the most common circulatory system diseases in Ukraine and the world. Early diagnosis of hypertension before damage to target organs (hypertrophy of the left ventricle, chronic kidney disease (CKD), vascular damage, etc.) is insufficiently effective. Therefore, the problem of early diagnosis of genetic, cardiometabolic and immunological factors in the formation of lesions of target organs due to hypertension, coronary heart disease, heart failure (HF), type 2 diabetes mellitus (T2DM) in the CVD continuum for the purpose of early secondary prevention is significant, relevant and needs final further study.

**The aim of the study.** Was to study adaptive-compensatory mechanisms by the level of organism cellular reactivity and adaptation index in patients with essential arterial hypertension (EAG) and chronic kidney disease (CKD).

**Material and methods.** 100 patients were screened for EAH. Then they underwent a complex of clinical and laboratory examinations with the following calculation of immune-hematological indices of cellular reactivity, intoxication and determination of immunological adaptation zones. CKD was determined by glomerular filtration rate according to Cockcroft-Gault and CKD-EPI (by creatinine and Cystatin-C blood levels based on sex), according to the recommendations of KDIGO (2012). The control group consisted of 30 practically healthy individuals who did not differ significantly by sex and age.

**Results.** In patients with EAH and CKD the cellular reactivity of the body is reduced 6.9 times, which is confirmed by a decrease of leukocyte intoxication indices after Ya.Calf-Calif by 43.18%, after B.A. Reis-by 39.23%. A lymphocytic-granulocyte index decrease by 42.86% in patients with EAH with comorbid CKD indicates the presence of intoxication caused by autoimmune mechanism (degenerative processes of own cells) and is confirmed by an increase in the ratio of the absolute number of leukocytes to erythrocyte sedimentation rate by 16.25%.

**Conclusions.** Adaptation processes in the majority (54.06%) of patients with EAH and CKD are found in the zone of quiet and increased activation, which is a prognostic favorable sign of the course of EAH and CKD and is indicative of a correct treatment.

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## **HETEROCYCLIC COMPOUNDS AND MEDICINE**

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**Introduction.** Heterocyclic compounds, or heterocycles, are cyclic organic compounds, the cycle of which includes a heteroatom, that is, an atom of any other element except carbon. Mainly heteroatoms are N, O, S atoms, much less often than other compounds.

**The aim of the study.** It is known that the most stable organic cycles of 5- and 6-membered structure are due to the fact that in such cycles the least pronounced cycle tension is due to the repulsion of C-C bonds. In nature, nitrogen-containing heterocyclic (azaheterocycles), oxygen-containing heterocycles, 5- and 6-membered compounds are a very large group of biological compounds with different properties and significance.

**Material and methods.** These are vitamins and coenzymes of many groups, substances of plant and animal origin, such as alkaloids, flavonoids, natural chalcones and many others. Azaheterocycles are one of the main building blocks of nucleic acids (DNA and RNA). In this regard, it is not surprising that many medicinal substances are heterocyclic compounds.

**Results.** Among all medicinal substances, organic substances significantly outnumber in organic medicinal substances, and among organic heterocyclic substances they make up, one might say, the lion's share. Among heterocyclic medicinal substances, there are the most diverse groups of substances in terms of pharmacological and physiological effects: antibiotics, antimicrobials, antivirals, antiparasitics, anti-inflammatory and analgesics, hypnotics and narcotics, nootropics and many other groups. It is logical to

expect that given the importance of heterocycles in the chemistry of life, they should have found application in medicine as well. This is true. Long before the development of pharmaceutical chemistry, people treated diseases using heterocyclic compounds from nature's pharmacy: leaves, fruits and bark of trees, roots and stems of herbs, extracts from insects, etc. The twentieth century is sometimes called the age of the Great Medical Revolution. One of its bright symbols, of course, should be considered  $\beta$ -lactam antibiotics – penicillin and cephalosporin, which have saved millions of human lives. Both of them are derivatives of heterocyclic compounds.

**Conclusions.** In recent years, there has been a breakthrough in solving such a difficult task as the creation of effective antiviral drugs. Of course, only a small part of what makes heterocycles interesting has been told. We should also mention the outstanding role of heterocycles in the respiratory process and energy conservation, photosynthesis, production of pesticides, dyes, heat-resistant polymers, analytical reagents and many other practically important materials. In recent years, a new rapidly developing field of science is closely related to heterocycles – supramolecular chemistry, which investigates the patterns of self-organization of molecules and their recognition by each other.

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### STUDY OF ANTIMICROBIAL ACTIVITY AMONG NEW PHOSPHONIUM SALTS

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**Introduction.** Uncontrolled prescription of drugs with antimicrobial action contributed to the selection of resistance of pathogenic and opportunistic microorganisms to antibacterial and antiseptic drugs, which in their turn led to an increase in the role of infectious diseases caused by resistant strains of microorganisms.

**The aim of the study.** In connection with a wide spread of microorganisms that have acquired resistance to many antibacterial and antiseptic drugs, it is necessary to search for new substances that could be used in medicine as antimicrobial and antiseptic substances.

**Material and methods.** Screening of antimicrobial activity among new naphthalene-containing phosphonium salts was carried out using 5 test cultures. Experiments to determine the antimicrobial activity of new phosphonium salts were performed applying the micromethod using disposable polystyrene tablets and Takachi microtitrators.

**Results.** The results of studying the antimicrobial activity of the indicated compounds are shown in the table.

Table

Antimicrobial activity of naphthalene-containing phosphonium salts ( $\mu\text{g/ml}$ )

№ compounds	<i>S.aureus</i> ATCC 25923		<i>E.coli</i> ATCC 25922		<i>E.faecalis</i> ATCC 29213		<i>P.aeruginosa</i> ATCC 27853		<i>B.subtilis</i> 8236 F 800	
	MIC	MB <sub>C</sub> C	MIC	MB <sub>C</sub> C	MIC	MB <sub>C</sub> C	MIC	MB <sub>C</sub> C	MIC	MB <sub>C</sub> C
1	7,8	15,6	250	500	62,5	125	250	500	7,8	15,6
2	7,8	15,6	250	500	62,5	125	250	500	7,8	15,6
3	15,6	15,6	250	500	125	125	500	>500	15,6	15,6
4	<b>7,8</b>	15,6	250	500	62,5	125	250	500	7,8	15,6
5	7,8	15,6	500	500	62,5	125	500	500	15,6	31,2
6	7,8	15,6	250	500	62,5	125	250	500	7,8	15,6
7	7,8	15,6	250	500	62,5	125	250	500	7,8	15,6
8	7,8	15,6	250	250	125	125	500	500	62,5	62,5
9	3,9	7,8	125	250	62,5	125	500	>500	7,8	15,6
16	3,9	7,8	125	125	62,5	62,5	500	>500	3,9	7,8

Note: MIC: minimum inhibitory concentration; MB<sub>C</sub>C: minimum bactericidal concentration