and the structural alignment carried out by the authors, identified the signal proteins PDB ID 5HIU and PDB ID 3IOR respectively, for the segment 301-600 AA structural protein (PDB ID 2OF3) and the contractile protein (2ENY (A), for the 601-900 segment of the AA hydrolase PDB ID 2IAE and PDB ID 2IBI (A) .The structural analogs for the chain 901-1800 chain of AA were not identified in this work. [8]. Among the possible functional activities of Htt the serine/threonine protein phosphatase 2A (PP2A) is an extremely important phosphatase involved in various aspects of cell function [15].

The expression of the subfamily TRPVs and TRPMs correlates with the induction of apoptosis of the cell, while TRPC promotes the survival of neurons in ischemic injury conditions. The results of the alignment of AA sequences and 3D structures of TRP proteins are related to ischemic injury of the nervous tissue indicate that the identity and similarity of the TRPV1 and TRPM7 sequences was 10% and 24%, respectively, with respect to 3% and 14% in the case of TRPC1 and TRPV1. A similar regularity is established in comparing the 3D structures of these proteins. Pairwise alignment of 3D structures of proteins was used and the values, whose value increases with the increase in the structural similarity of the compared proteins (Score and Z-score), in the first case, were 769.14 and 5.46, and in the second 343.29 and 4.07, respectively. To characterize the average distance between atoms of superimposed 3D structures of proteins, the root-mean-square deviation (RMSD) is used. The more similar the structures, the denser they overlap, than smaller the value of the indicator. With pairwise alignment of the TRPV1 and TRPM7 structures, the RMSD was 3.04, while in aligning of TRPC1 and TRPV1, 3.42. Thus, the results of alignment of 3D structures of selected representatives of TRP proteins indicate that the different functional role of TRP proteins can be due to differences in their primary and tertiary structures.

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OXIDATIVE STRESS AND BRONCHIAL HYPERSENSITIVITY TO LOW TEMPERATURE AND OSMOTIC FACTORS

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To study the role of oxidative stress (OS) in the formation of bronchial hypersensitivity to the action of low temperatures and osmotic factors, we proposed a method for the determination of oxidatively modified lipids in an exhaled air condensate [1]. The method consists in recording the UV absorption spectra of lipid extracts from exhaled breath condensate

(EBC), which allows one to estimate the degree of oxidation of lipids by the content of diene conjugates in nmol/ml and two relative parameters of A233nm/A206nm and A278nm/A206nm. Where A206nm corresponds to the absorption maximum of the unoxidized lipid, A233nm to the absorption of diene conjugates, and A278nm to the absorption of conjugated trienes and ketodienes. To estimate the total lipid content in EBC samples, absorption at 206nm (A206nm) can be used [1].

The effect of hyperosmolar stimuli (inhalation 4.5% NaCl and dosed physical exercise) was accompanied by a decrease in the total lipid content in EBC (A206nm) by 20 and 30% after the sample, whereas in response to the action of the hypoosmolar stimulus, inhalation of distilled water (IDW) an increase of 25%. The content of diene conjugates (A233nm) decreased slightly after the samples, more in response to aerosol samples (IFNs) and inhalation of hypertonic solution (IHS) than to dosed physical exercise (DPE). The lowest values of this indicator were revealed in response to the IDW. The content of conjugated trienes and ketodienes (A278nm) did not change in response to the provocation. The initial value of FEV1 before the provocation was closely related to the content of unoxidized lipids in the EBC after carrying out the sample of the IDW ($r = -0.81$, $p = 0.003$) and the ratio E206 / E233 for the GCR sample ($r = -0.73$; $p = 0.042$). In the sample with DPE, the values of A233nm and A278nm after testing were more dependent on the load performed during the test ($r = 0.65$, $p = 0.006$ and $r = 0.62$, $p = 0.01$, respectively) than from the initial throughput respiratory tract. A convincing correlation was found between the FEV1 in response to DPN and the following changes in the production of diene conjugates following the provocation ($r = -0.57$, $p = 0.021$). The obtained data indicate that osmotic stimuli can modulate the intensity of lipid peroxidation (LPO) in healthy people and play an important role in adapting the respiratory tract. The content of lipid peroxidation products in the airways of patients with asthma, in the process of bronchial provocation in the form of DPE, can serve as an objective evidence of differences in the degree of expression of oxidative processes and inflammation in individuals with opposite types of bronchial response to exercise [2-4].

When studying the levels of lipid hydroperoxides (HP) in the blood of patients with a positive and negative reaction to the hyperosmolar stimulus, it was found that, after a sample with IHS, the content of HP in both groups increased and significantly differed in patients with bronchospasmic reaction to IHS, significantly exceeding this value in the control Group. In parallel, the blood contained the content of two antioxidants - ceruloplasmin (CP) and vitamin E. The content of CP in the blood of patients with bronchial asthma (BA) was lower both before and after the GHI test. The content of vitamin E in the group of patients with asthma was reduced in relation to healthy individuals and did not change after a sample [5]. The initial content of lipid peroxidation in EBC in patients with asthma with hyperreactivity in IHS and its absence was not significantly different. However, after the sample in patients who had a reaction to a hypertonic solution, the content of diene conjugates increased with CVI, with the appearance of significant differences for the A233/206 index in relation to persons who did not respond to GHI. The relative increase of this index was inversely associated with the amplitude of the decrease in the parameters of the ventilating function of the lungs (ΔFGEL ($r = -0.44$, $p = 0.004$), ΔOPV1 ($r = -0.36$, $p = 0.02$), ΔMCO50 ($r = -0.37$, $p = 0.01$)). Analogous correlations were noted between the variables ΔFGEL, ΔOPV1 and the change in the content of GP ($r = -0.46$, $p = 0.004$ and $r = -0.39$, $p = 0.01$, respectively). The value of A206 nm, in patients with airway hyperreactivity on IFV significantly exceeded the values in patients who did not have a reaction and healthy individuals. A similar trend was obtained for the value of A233nm, but the figure was lower than in patients with hyperreactivity in the IHS. The oxidation index (A233/206nm) in patients with osmotic bronchospasm also proved significantly lower in relation to patients with a lack of response and healthy. When analyzing changes in response to a bronchoprovocation test in these patients, an increase in the index was found, mainly due to an increase in the concentration of primary products of lipid peroxidation, whereas in patients without a response and healthy a reduction of A233/206nm was recorded. In patients with asthma who reacted to DFN with bronchoconstriction, a higher level of both unoxidized and oxidized lipids was found in CVC. The base value of OP206 nm was significantly higher than in patients with a lack of response to DPN and healthy individuals. A similar trend was obtained for both A233nm and the oxidation index (233 / 206nm). In response to the bronchoprovocation test, this index increased, whereas in patients without hyperreactivity and healthy, no dynamics were observed. With higher values of A233nm, A278nm and 233 / 206nm, the parameters of the number of eosinophils, the levels of the synthesis of myeloperoxidase in the azurophilic granules of cells and the cellular secretory activity in patients with postnagruzochnym bronchospasm were correlated in QBW. A clear connection was observed between the ICS of eosinophils in MI, the base concentration of A206nm, A233/206nm, A278/206nm and the subsequent bronchial response (ΔFV1) to DFN ($r = -0.83$; $p < 0.01$; $r = -0.39$ $p < 0.01$; $r = -0.46$ $p < 0.01$; $r = -0.34$ $p < 0.01$, respectively). In patients with hyperreactivity of the respiratory tract on IFV, a double increase in blood glucose in the blood was detected while simultaneously reducing the low content of diene conjugates and malonic dialdehyde in comparison with persons with unchanged reactivity. In these patients, a close relationship was found between increased HP production in the blood and bronchial response to a hypoosmolar stimulus ($r = -0.65$, $p < 0.05$). The presented data testify to the important role of oxidative modification of lipids in weighting the respiratory tract reaction on the osmotic stimulus, which contributes to the loss of control over asthma [2-4].

As it was shown in earlier studies in the development of bronchial hypersensitivity to temperature and osmotic factors, an important role belongs to the channels of the transient receptor potential (TRP channels) [6]. Individual representatives of the TRP superfamily, in particular TRPM8, TRPA1 and TRPV1, are directly related to the development of hypersensitivity of the airways to hypoosmolar stimuli and low temperatures [2]. In this study, an attempt has been made to characterize TRP channels using bioinformatics techniques. We used the UniProt database http://www.uniprot.org/ and NCBI Protein http://www.ncbi.nlm.nih.gov/protein: to search for AMC sequences, characteristic motifs in the structure, active centers, functional activities of TRP Proteins, and carrying out multiple and global pairwise alignment of sequences. To build a sequence library similar to the sequence of the protein of interest, by comparing its sequence with the sequences of other proteins included in the database, we used the UniProt BLAST algorithm. The PDB ID of

the TRP proteins was found in the UniProt database in http://www.uniprot.org/ and compared their sequences and 3-D structures using the RCSB PDB using the Analyze Option Sequence and Structure Alignment option (http://www.rcsb.org/pdb/home/home.do. Modeling of 3D structures of TRP proteins was carried out on the SWIS-MODEl server on homology with template proteins. As of July 2016g. The UniProt database includes 1922 descriptions when requesting a transient receptor potential cation. Of this number, 122 refer to human proteins. In the NCBI Protein database, respectively, 10730 and 424 descriptions are identified with a similar query. TRP proteins contain from 700 to 2,000 amino acid residues: TRPM8-1104, TRPA1-1119 and TRPV1-839. The specific specificity of TRP proteins decreases in the direction of TRPA1> TRPV1> TRPM8. In the databases of 3D protein structures - PDB and PDB Europe, there are only single descriptions of 3D structures of TRP proteins established by X-ray crystallography, NMR spectroscopy and cryoelectron microscopy - 30 (9) and 43 (13), respectively. When carrying out structural alignment, it is established that the similarity of 3D structures is more pronounced within a single family than between representatives of different families. In particular, 3D structures TRPV1 and TRPV2 are identical by 36% and are similar to 52%, and TRPA1 and TRPV1 are only 11% and 25%, respectively. Due to the fact that the description of the 3D structure of TRPM8 in the bases of 3D structures of proteins is missing, we generated the 3D structure of its monomer, using TRPV2 as template (ID 5hi9.1.A). The identity of the TRPM8 sequences and the template was 18%, and the similarity was 28%. The model is generated for section 429-1055 AMK, coverage rate is 43%. The establishment of 3D structures of TRP proteins is extremely important for the creation, using computer design, targeted drugs intended to affect these proteins. A special TRP protein base (TRIP) has been created that contains comprehensive information on protein-protein interactions in TRP channels by categories of screening, evaluation, characterization and functional consequences [7].

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THE MECHANISM OF ELECTROACUPUNCTURE IN IMPROVING MEMORY DYSFUNCTION IN OVARIECTOMIZED RATS

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Objective:The model of memory dysfunction induced by ovariectomy resulted in estrogen deficiency was established in this research in order to observe the improvement effect of electroacupuncture on Baihui, Shenshu, Housanli by tonifying kidney. And the mechanism of electroacupuncture on improving memory dysfunction induced by ovariectomy was explored to demonstrate the mechanism of the electroacupuncture by tonifying kidney and to provide the strategy for treatment of memory impairment caused by low estrogen level.

Methods:The rats were randomly divided into 5 groups, sham group, model group, electroacupuncture (EA) group, non-acupoint group and E2 group. Ratswere all ovariectomized except sham group. EA group refers to acupuncture onBaihui, Shenshu, Housanli, and non-acupoint group was treated with acupuncture on 1/3 of rat root of tail. Besides, the E2 group was given intragastric estradiol valerate till the end of behavioral test. Then the blood was collected and brain was separated, for serum E2 assay and detection of the expression of protein in the CA1 area of the hippocampus, respectively. The serum E2 level was determined by ELISA. And the expression of ERα, BDNF and TrkB in hippocampus CA1 region was detected by immunohistoch-emical assay and western blot.

Results:Morris water maze experiment results showed that the avoidance latency time of rats in model group was longer and the number of crossing platforms was decreased, and in the EA and E2group, the avoidance latency was shortened and the number of crossing platforms was increased. The serum E2 level of rats in model group was significantly reduced and that of EA and E2group

was elevated.Immunohistochemical staining results showed thatthe ERα content of hippocampal CA1 area in model