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DETERMINATION OF BIOMARKERS P53 AND KI- 67 IN RATS` SPLEEN WHILE DEHYDRATION

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The spleen is one of the largest lymphoid organs, it is an organ of the circulatory system. The basic function of rats` spleen is similar to that of a man, which is to clean the blood from damaged old particles of the body itself .The rat`s spleen is equipped with the red and white pulp with a specific structure of blood circulation. Being affected by unfavourable factors, the spleen has a system of protective mechanisms, which are based on the processes of cell renewal and apoptosis. We analyzed the localization and quantification of the expression of apoptosis markers p53 and Ki-67 proliferation of the rats` spleen during cellular dehydration.

Outbred white laboratory rats with average weight of 210.0 grams were divided into 2 groups. The 1st group which consisted of 6 rats, was used as a control group. The 2nd group – experimental. 6 rats were in conditions of medium cellular dehydration, that was achieved within 20 days of the experiment (cellular moisture deficit was 5-10%). Rats were given 1.5% hypertonic salt solution, and as food - granulated mixed fodder. All animals were taken out of the experiment by decapitation under anesthesia. For immune morphological research we used immunoperoxidase method using primary specific monoclonal antibodies. «Thermo scientific» (USA) The results of immunohistochemical reactions were assessed with the help of quantitative morphometric method. We calculated the number of Ki-67-positive and p53-positive splenocytes per 1mm^2 of area unit of the spleen microscopic section.

The result of the research showed, that in the experimental group of rats number of P 53 increased twice and reached 2419,41 ± 71,40 cells per 1mm^2 of area of the spleen microscopic section, and the expression of Ki - 67 was 2829,12 ± 112,20 cells, which is 56% less of that of the control group.

Thus, the prevalence of apoptosis over proliferative apoptotic processes in the spleen indicates splenic hypofunction while average cell dehydration.

THE STUDY OF MORFOLOGICAL PROPERTIES OF THE ABDOMINAL AORTA CALCIFICATES BY THE MEANS OF SCANNING RASTER MICROSCOPY

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Introduction. In normal condition calcium hydroxyapatite is present in the body as a component of bones. Metabolic disorders cause its deposition in the walls of vessels. Numerous studies confirm that calcification of the parts of cardiovascular system is actively regulated process that has much in common with the evolution and metabolism of bone tissue. However, significant differences in the conditions and mechanisms of formation of ectopic deposits make the task of its consistent study complex and ambiguous.

The aim of this study was to determine the morphological features of the calcificate deposits' structure by the means of raster scanning microscopy.

Materials and methods. Calcificates were obtained from 6 pieces of abdominal aortae annealed at temperature 400ºC. Plates of calcificates were mechanically separated, weighed on analytical scales and divided into two series. The first consisted of annealed calcificates, the second - annealed and sonicated for 1 min. Samples of both series were attached to conductive surface and

silvered. The scanograms of the deposits' surfaces were obtained by the means of raster scanning microscopy.

Research results. The results showed that the calcifications are built with well-crystallized apatite. Received scanograms clearly show general dependencies in structure of deposits: surface facing walls of blood vessels is smooth and the one that is facing vascular lumen is rough. Therefore smooth, convex surface has a dense nature and less cracks while rough surface has a high amplitude terrain with a clear focus of crystallization. The inner surface of deposits has a crystalline layer of small aggregates. After sonication the layer of small crystals became less sinewy, more pores appeared on rough surface. The presence of pores in the structure of deposits may indicate the participation of organic compounds in the process of formation of pathological biominerals.

Conclusions. Raster scanning microscopy made it possible to explore the structure of calcificates. Deposits have a layered structure. Calcificates have two walls: the inner one has no signs of ordered structure while the outer one is smooth and convex. The presence of pores in the structure proves its heterogenic structure mainly caused by organic components involved into the formation of calcificate.

HOMOCYSTENE AND HUMAN ASTROCYTES

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Astrocytes are multipotent and serve surprisingly large and diverse variety of functions, providing for the overall brain homeostasis, assisting in neurogenesis, determining the microarchitecture of the grey matter, and defending the brain through evolutionary conserved astrogliosis programs. Astrocytes are specifically involved in various neurodegenerative diseases, including Alzheimer's and Parkinson's diseases, and various forms of dementia. Homocysteine is a nonessential sulphur-containing amino acid that had been linked with neurodegenerative diseases and aging. It has been shown, that an increased plasma homocysteine level is an independent risk factor for the development of dementia, Alzheimer's and Parkinson's diseases. Homocysteine behaves as an excitatory molecule which markedly enhanced the vulnerability of neuronal cells to exitotoxic, apoptotic, and oxidative injury *in vivo* and *in vitro*. However, data about the neurotoxic effect of homocysteine on human astrocytes are lacking. Therefore, we decided to investigate the effect of homocysteine on cultured human astrocytes. We tested cell viability by various tests (MTT and Annexin tests). Homocysteine negatively affected the cell viability in dose-dependent manner, which was evaluated by decreased cell density and lowered ability of cells to metabolize MTT. However, the molecular mechanisms by which HCY induced neurotoxicity are still unknown. Targeting of astroglia may provide a new principle for treatment of neurodegenerative diseases, especially at early stages of AD.

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CHARACTERIZATION OF DENTAL TISSUE DERIVED STEM CELLS

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Stem cells (SCs) are undifferentiated cells that are capable to differentiate into more specialized cells with specific functions. Oral tissues, which are easily accessible for dentists are a rich source of stem cells. The isolation of stem cells from these location may still not be convenient, because most of them requires surgical procedures, tooth or pulp extraction. Furthermore, these SCs