

## ABSTRACTS

### FUNDAMENTAL SCIENCES SECTION

#### 1. VARIANT ANATOMY OF THE CORONARY ARTERIES AND THEIR BRANCHES. MATHEMATICAL CALCULATIONS TYPE BLOOD SUPPLY HEART BASED MORPHOMETRIC PARAMETERS.

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**Introduction:** Despite the long history of the study of the heart as the central organ of cardio-vascular system, the problems associated with the pathology of coronary arteries (CA) and their branches do not lose their relevance to this day. For many years, the focus was research CA, in various pathologies, the results of which do not provide a complete picture of architectonic features and morphometric characteristics. Equally important is to determine the blood supply of the heart (TBSH). The classical definition of TBSH describes exclusively anatomical features architectonic vessels and does not give the amount of blood flowing through the vessels and the blood supply to the area. "White Spots" to explore issues underscore the urgency of research topics in theoretical and clinical relationships.

**Purpose and objectives:** To determine the particular variant anatomy and subepicardial vascular branching CA, as well as mathematically calculated based on the type of blood supply to the morphometric data.

**Subjects:** 58 human heart preparations of both sexes. Methods: Makrodissection, mikrodissection, morphometry, the statistical method, mathematical modeling.

**Results:** During the study it was found that the left coronary artery (LCA) has three options architectonics: typical - bifurcation, with the division into two branches (anterior descending branch (ADB) and the circumflex branch (CB) - 75%), trifurcation (ADB, CB and left marginal branch (LMB) - 23%), kvadrifurkatsiya (ADB, CB, LMB and branch cone (BC) - 2%).

ADB for the anterior interventricular sulcus also has 3 options architectonics: 1 - reaches apex of the heart - 55 % 2 - disappears between the middle and lower third of the anterior interventricular sulcus - 15 % 3 - goes around the top of the heart and extends into the lower third of the posterior interventricular sulcus - 30 %.

As well, we have developed an algorithm of actions and calculations, allows us to calculate TCS from a mathematical point of view, given the above mentioned morphometric parameters.

**Conclusion:** The method proposed for the determination of blood supply with the help of mathematical calculations, to determine the TBSH based not only on the anatomical structure as well as on the morphometric parameters of the heart.

Data on structural - functional organization and topographic - anatomical relationships VA obtained using modern research techniques, including computer programs, can be used in anatomy - in particular, in addition to the guidelines, as well as in cardiology and cardiac surgery.

**Keywords:** variant anatomy, coronary arteries, blood supply heart.

#### 2. EIGHT CHANNEL AUDIOSYSTEM TO CONTROL THE COURSE OF NEUROPHYSIOLOGICAL EXPERIMENT

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**Introduction:** Visualization of processes that are happening in an organism is implemented by means of rapid progress of electronics and computer systems. Especially valuable is visualization of physiological processes in central nervous system as they are short-term, unexplored and complicated in



their mechanism. We propose a new controlling system over the course of neurophysiological experiment during implantation into a brain of a rat multichannel electrode.

**Materials and Methods:** Eight channel original steel microelectrode with interspaces between each conductor. Through the trepanation opening the electrode was placed stereotaxically in motor cortex under narcosis. A chain of devices pre-amplifier, filters, post-amplifier, conductor and receiver were produced in neurophysiological experiment lab of National Pirogov Memorial Medical University. Registration of biopotentials is held through analog-to-digital converter on magnetic carrier at the same time potential from each channel was passed to eight channel amplifier and then to dynamics placed along the perimeter of a lab.

**Discussion results:** The same time with visual control over neurons' biopotentials we controlled the course of experiment using audiosystem.

**Conclusion:** The proposed device improves the perception of the experiment course by the researcher, helps to imagine the spatial arrangement of neurons surrounding the eight channel electrode and provides new opportunities for assessment of interaction between neurons.

**Keywords:** audiosystem, multichannel electrode, nervous system, rat

### 3. GENETIC SUSCEPTIBILITY TO ASTHMA IN CHILDREN

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**Introduction:** Bronchial asthma is a chronic inflammatory disease based on an inappropriate stimulation of the immune system, for instance by environmental aeroallergens. It is characterized by bronchial hyperreactivity, reversible airway obstruction and mucus overproduction. During the last decades bronchial asthma has become the most common disease of childhood. Accordingly, many epidemiological and genetic studies have dealt with its origin. In fact, hundreds of genome-wide linkage analyses and association studies have identified several chromosomal regions harboring asthma susceptibility genes like chromosome 2q, 5q, 6q, 11q, 12q and 13q. Also about 100 candidate genes for asthma have been described. However, not all of them have been confirmed in independent studies. Besides the genetic predisposition environmental factors play an important role in the development of allergic diseases. Thus, recent studies focused also on the interaction of genes variants with environmental factors which is summarized under the term genetic epidemiology.

**Purpose and Objectives:** To evaluate peculiarities of functionally compromised alleles and genotypes spread of the CC16 gene in the general population sample of Moldovans; to assess the frequencies of alleles and genotypes of the CC16 genes in children with asthma and healthy controls; to study the association of genetic polymorphisms with asthma phenotypes; to evaluate the risk of childhood asthma development under the influence of the gene-environment interactions; to develop prognostic methods for the asthma onset and clinical evolution assessment in children.

**Material and methods:** The project is based on 15 children with asthma, in which we collected the history, including allergy history and collateral history, in order to build their pedigrees. We performed meta-analysis which reveals the connection between mutant allele of CC16 gene and asthma's phenotype.

**Results:** The study findings reveal aspects of the pathogenetic mechanisms of multifactorial disease development in ethnic Moldavians. The elaborated prognostic algorithm allows identifying high risk subjects for atopy and asthma development. The study revealed peculiarities of the spread of asthma candidate genes in children of Moldovan ethnicity and identified genetic markers and their combinations that potentially increase the risk of asthma development and are associated with clinical phenotypes of the disease.

**Conclusion:** Particular genetic variants of the asthma candidate gene CC16 in Moldovan children were assessed; the role of genetic factors and gene-gene interactions in the asthma development was determined; unfavorable genetic variants for the asthma development and evolution in native population were identified.

**Keywords:** asthma, genetics, polymorphism, mutations