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Cell, tissue, organs - experience, innovation and progress

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Aims and scope

Annals of Anatomy publish peer reviewed original articles as well as brief review articles. The journal is open to original papers covering a link between anatomy and areas such as

- molecular biology
- cell biology
- reproductive biology
- immunobiology
- developmental biology, neurobiology
- embryology as well as
- neuroanatomy
- neuroimmunology
- clinical anatomy
- comparative anatomy
- modern imaging techniques
- evolution, and especially also
- aging

Moreover, manuscripts dealing with all forms of anatomical teaching and new forms of curricula will be considered for publication. Priority will be given to experimental studies; merely descriptive studies will only be published if the Editors consider that they are of functional significance.

For more than a century the *Annals of Anatomy* have been one of the most famous and widespread journals on morphology. The journal is the official journal of the **Anatomische Gesellschaft (Anatomical Society)**.

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Dewaxing of sections was carried out with xylene. When using the developed method, the total time spent on staining the thymus sections was significantly 45 ± 1.2 minutes in the main group and 120 ± 5.1 in the comparison group. In the comparison group, during staining, most of the slides were empty due to the loss of sections from the slide (50%). In the comparison group, out of 50% of the remaining sections after staining, the percentage of differentiation of Hassall's bodies was only 50-60%. In the main group, in most cases (90-95%), there was a better differentiation little bodies in the field of view of the microscope.

CONCLUSION: The research results showed the advantages of the developed method: adjustable temperature balance of painting stages; improving the penetration of paint into thymus structures; shortening the painting time by an average of 1.2 hours; reducing the loss of sections during staining by 2 times; obtaining the quality of differentiation of Hassall's bodies; safety and simplicity of execution and economy.

Abstract number 7

Resistance of probiotic strains contained in traditional fermented products to conditions of the gastrointestinal tract (*in vitro*)

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BACKGROUND: Camel milk and other fermented products based on it are rich useful metabolites of lactic acid bacteria (LAB). Shubat contains lactic acid and it is obtained in the fermentation process. The following microorganisms are most often found in the microflora in camel milk: *Lactococcus species*, *Pediococcus species*, *Enterococcus species*, *Weissella species*, which indicates the possibility of the subsequent use of isolated LABs as probiotic microorganisms.

In order to create new probiotic products, it is necessary to isolate microorganisms that have special biotechnological properties from fermented products. At the same time, special attention needs to be focused on strains that are capable of maintaining biochemical activity for a longer period of time. It should also be borne in mind that functional properties largely depend on specific strains and their quantities in the final product.

In selection of probiotics active strains, it is necessary to take into account the following properties: resistance to high concentrations of salt, bile, various pH values, antibiotics and antagonistic activity against pathogenic and opportunistic microflora, acidification energy, synthesis of proteolytic enzymes.

Earlier we have isolated and identified the following LAB: *Lactobacillus casei* (isolate B 3.1), *Lactobacillus casei* (isolate B 3.2), *Lactobacillus casei* (isolate B 4), *Enterococcus faecium* (isolate B 5.1), *Enterococcus faecium* (isolate B 5.2), *Lactobacillus paracasei* (isolate B 7), *Lactobacillus paracasei* (isolate B 10.1), *Lactobacillus paracasei* (isolate B 10.2), *Lactobacillus paracasei* (isolate B 11).

This work reflects the results of testing the resistance of isolated and identified LAB from shubat to low gastrointestinal acidity and pepsin.

METHODS: Cell suspensions in 10mM phosphate-buffered saline pH7.2, with cell density of 10^9 cell/ml, were diluted 10-fold in sterile saline solution containing 3g/l pepsin from porcine stomach mucus (Sigma, St. Louis, MO) and adjusted to different pH values (1.5, 2.0, 2.5) with HCL. Aliquots were taken after 0 and 90 minutes of incubation at 37°C. Growth ability was determined by plate counting on MRS agar.

RESULTS: Comparative survival of probiotic LAB in simulated gastric juice. In order to evaluate the survival of LAB in acidic conditions, we compared the survival of nine LAB strains in simulated gastric juice, pH 1.5, 2.0, 2.5 for 0 and 90 min.

Lactobacillus paracasei (isolate B7) showed good growth at pH 1.5 and 90 min of exposure. *Enterococcus faecium* (isolate B 5.2) had the highest survival rate at over 90 min of exposure to simulated gastric juice (pH=2.0) compared to other strains. At pH 2.5, the following strains showed good resistance: *Enterococcus faecium* (isolate B 5.2), the survival rate compared to the control was 65.4%, *Lactobacillus paracasei* (isolate B7) – 61.6%, *Lactobacillus paracasei* (isolate B 11) – 58.21%. Average value of indicators and standard deviation ($p < 0.05$).

CONCLUSIONS: The findings lead to the conclusion that strains isolated from fermented camel milk have a good resistance to the enzymatic activity of the gastrointestinal tract. However, *Enterococcus faecium* (isolate B 5.2), *Lactobacillus paracasei* (isolate B 7) have indicated a higher resistance than other strains. All selected isolates will be further tested for antibiotic resistance and antagonistic activity.

Abstract number 8

Structural changes in the liver of animals infected with HSV-I and under the conditions of hemorrhagic stroke and anti-viral correction

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BACKGROUND: Herpes simplex virus (HSV) is induced by acute stroke because of immune deficiency and is a common complication of this disease. There are a lot of antiviral drugs with different mechanisms of action nowadays. The selection of a drug suitable for a particular patient with certain symptoms is still an important task.

The aim of the work is to study the histological changes of the liver against a background of hemorrhagic stroke and HSV-1 with the following Altabor correction.

METHODS: The study was conducted on laboratory mice of the Balb/c lineage, an average weight of 18-20 g. Mice were infected with HSV-1 and experimental stroke was simulated [Hara Y. et al; Joshi P.]. Animals were divided into 3 groups, 10 animals each: group 1 – intact mice, group 2 – HSV-1 with hemorrhagic stroke, group 3 – HSV-1 with hemorrhagic stroke and Altabor company "Borshagivskiyi KhFZ". Animals of group 3 have been treated with 5 mg/kg of Altabor intraperitoneally once a day for 10 days. Liver samples of experimental animals were subjected to morphological and morphometrical study. State of the blood vessels of the liver, changes in hepatocytes, the presence and density of leukocyte infiltrates have been studied. The morphometric analysis was performed using the Olympus BX 51 microscope and the Carl Zeiss software (Axio Vision SE64 Rel.4.9.1). Statistical processing was performed through nonparametric criterion of Kruskal-Wallis.

RESULTS: A tendency to decrease the structural changes of the microcirculatory system of the hepatic lobules and infiltration of mononuclear leukocytes relative to the comparison group without pharmacocreation was revealed in the group with Altabor.

Focal foci of inflammation were also detected with the same frequency (40.0% on day 10 and 47.1% on day 30). Diffuse infiltration of macrophages and lymphocytes on day 30 dominated over other manifestations of the inflammatory response (detected in 20.0% on day 10 and 76.5% on day 30). Particular hypertrophy of the hepatocyte nucleus slightly prevailed over lysis and hepatocyte dystrophy: 60% vs. 40% at 10 days and 70.6% vs. 47.1% respectively. A statistically significant change in liver structure was found in the experimental group with Altabor ($P < 0.05$) according to the nonparametric Kruskal-Wallis test.

The presence of specific and nonspecific changes in the liver was revealed in groups with Altabor pharmaco-

correction. The tendency to decrease development of the inflammatory reaction, foci of diffuse infiltration and focal infiltrates was revealed. The decrease of lysis of hepatocytes and number of cells with atypical nuclei is an indirect manifestation of an infectious organ damage decreasing. An increasing number of cells with preserved nucleus and cytoplasm, nuclear hypertrophy can be assessed as a manifestation of functional cell activation.

CONCLUSION: Thus, histological methods indirectly make it possible to assess the consequences of the infectious process, the qualitative and quantitative changes in the affected organ and to make conclusions about the probable causes of regenerative processes activation. Hence, under the influence of Altabor there is a partial reduction in pathomorphological signs of the structural changes in the liver of animals with reactivation of HSV-1 in stroke.

Abstract number 9

Comparative assessment of the condition of the palatine tonsils after the use of various methods of chronic tonsillitis treatment

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BACKGROUND: The tonsillar problem, despite its age, remains relevant due to the frequency of pathology associated with both the Palatine tonsils themselves and other organs and systems.

The aim of this work was to perform a histological study of the palatine tonsils removed in patients with chronic tonsillitis after various preoperative treatment methods (constant electric current (CEC) low power, ultrasound, ultraviolet radiation).

METHODS: Clinical studies cover 148 patients with compensated form of chronic tonsillitis. Observations were made in three groups of patients: (main and two control groups). The main group included 108 patients with chronic tonsillitis who were treated with a constant electric current of 20 μ a according to the method developed by us (patent for invention №. 30612 of 11.01.99). The first control group included 40 patients who were treated with ultrasound. In the second control group (40 patients), ultraviolet radiation was applied locally. Of the 148 patients, 87(58.8%) were women and 61(41.2%) were men. The age of patients is from 17 to 30 years. Histological examination of Palatine tonsils was performed in 21

patients of the main group, 15 patients of the first control group, and 17 patients of the second control group. After 8-10 times of direct electric shock of 20 μ A with an exposure of 10 minutes on the right Palatine tonsil, both tonsils were removed for medical reasons. The left amygdala served as a control.

RESULTS: When morphological examination of the Palatine tonsil tissue that has not been treated, infiltration of lymphocytes and neutrophilic leukocytes is noted in the epithelial cover. The lymphoid follicles are hypertrophied. The reactive center is well defined. Studies of tonsils exposed to PET showed that infiltration disappeared in the epithelial cover, and the crypts of the tonsils were cleared of detritus masses. Whole viable lymphocytes are observed in the crypt cavity.

After treatment, a definite clinical effect was observed in the main group of patients. Pharyngoscopy showed a decrease in the size of the tonsils, disappeared: hyperemia of the arches, as well as the pathological contents of the lacunae of the Palatine tonsils.

Studies of tonsils exposed to ultrasound showed that inflammatory infiltration of the epithelial surface of the tonsils decreased, and the intensity of the inflammatory process remained in the subepithelial layer. In the lacunae of the tonsils, pathological contents (detritus) remained.

After UV irradiation of the tonsils, the patients' condition improved. The purulent contents of the lacunae disappeared. However, the morphological picture of the Palatine tonsils almost did not differ from that before treatment.

CONCLUSIONS: Thus, a comparative clinical and morphological analysis of the patients of the main and control groups before and after treatment of chronic tonsillitis indicates that the tendency to normalize the General condition and morphological picture of the Palatine tonsils in patients of the main group is more evident than in the control groups, which indicates the advantage of the developed method of therapy.

Abstract number 10

The influence of a constant electric current of small force on the morphological structure of the mucous membrane

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BACKGROUND: The effect of a low-power direct electric current on the mucous membrane of the ENT

organs is studied insufficiently nowadays. However, due to the widespread use of this physical factor in otorhinolaryngology, the study of this effect becomes relevant. The purpose is to study the relationship between some parameters of the electric current and the morphological rearrangement of living tissue that develops during this process.

METHODS: The experiment was performed on 30 dogs weighing 4-7 kg. All dogs were divided into 5 groups of 6 animals each. Dogs of the 1st group used a constant electric current of 5mA, in 2-nd group - current 10mA, from group 3 - current strength 20 mA, 4-th group - current 30 mA, 5-th group - current of 40 mA. We divided each group into 2 subgroups. In animals of the first subgroup, the duration of the electric current was 10 minutes, in dogs of the second subgroup-20 minutes. Morphological analysis was performed on the mucous membrane of the vestibule of the oral cavity of animals before and after the experiment. The method of the experiment was as follows: under hexinal anesthesia in animals, a piece of the mucous membrane of the vestibule of the mouth was excised on one side, which served as a control. Then an electrode (anode) was connected to the symmetrical section of the opposite side and connected to the positive pole of the galvanic apparatus. Another electrode (cathode) in the form of a lead plate was fixed on the animal's forelimb with a rubber bandage and connected to the negative pole of the device. After a single electric shock, a section of the mucous membrane located directly under the anode was excised in one of the listed parameters. Histological preparations were prepared from the taken pieces of the mucous membrane.

RESULTS: Our observations have shown that the effect of a constant micro-force electric current on the mucous membrane is ambiguous and depends on the strength and duration of the procedure. Thus, current of 5-10 mA at exposure for 10 and 20 minutes did not cause visible morphological changes in the mucosa. When the current was increased to 20 mA, the reaction of the mucosa was different. So, if the exposure for 10 minutes showed a spasm of the stroma vessels, then with an increase in the duration of exposure to 20 minutes, vascular paresis was noted. Probably, as a further development of this process, we see a significant increase in edema of the mucosal stroma at current of 30 mA, which is especially pronounced when the procedure lasts 20 minutes. With a subsequent increase in the current strength to 40 mA, the swelling and its prevalence decrease, but in some cases, when exposed for 20 minutes, a burn of the mucous membrane occurs.

CONCLUSIONS: 1. The most favorable for the morphological structure of the mucous membrane is electric current of 20 mA with a duration of the procedure of 10 minutes.

2. The current of the specified strength and duration of exposure has a vasoconstrictive effect, which,