

**Міністерство охорони здоров'я України
Полтавський державний медичний університет
Наукове товариство анатомів, гістологів,
ембріологів та топографоанатомів України**



МАТЕРІАЛИ

**науково-практичної інтернет-конференції
з міжнародною участю**

**СУЧАСНІ ПРОБЛЕМИ ВИВЧЕННЯ
МЕДИКО-ЕКОЛОГІЧНИХ АСПЕКТІВ ЗДОРОВ'Я ЛЮДИНИ**



**ПОЛТАВА
11-12 жовтня 2022 року**

Редакційна колегія:

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Галина ЄРОШЕНКО – заступник головного редактора

Наталія УЛАНОВСЬКА-ЦИБА – відповідальний редактор

Матеріали науково-практичної інтернет-конференції з міжнародною участю «СУЧАСНІ ПРОБЛЕМИ ВИВЧЕННЯ МЕДИКО-ЕКОЛОГІЧНИХ АСПЕКТІВ ЗДОРОВ'Я ЛЮДИНИ». – Полтава: ТОВ НВП «Укрпромторгсервіс», 2022. – 158 с.

organization of blood capillaries also demonstrates improvement of transcapillary exchange.

The nuclei of many endotheliocytes had an oblong shape, invagination of the karyolemma, and euchromatin that prevailed in the karyoplasm. We observed preserved membrane organelles in the cytoplasm; free ribosomes and polysomes were also there. Pinocytotic vesicles and caveolae were found in the cytoplasmic areas of endotheliocytes. The capillary basement membrane was moderately thickened but contoured.

DMH-induced CRC leads to severe destructive and neurodegenerative disorders, indicating significant damage to experimental animals' cerebral cortex. We identified significant microscopic and submicroscopic changes in cerebral cortex neurocytes, the destruction of their nuclei, and organelles.

The use of Au/Ag/Fe nanoparticles led to a considerable improvement in the condition of the structural components of the cortex; reduction of destructive changes in blood vessels, which in turn contributed to the activation of neurocyte regeneration.

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MORPHOMETRIC CHARACTERISTICS OF THE RAT'S CECUM WALL IN CONSUMPTION OF THE COMPLEX OF FOOD ADDITIVES IN LAST TERMS OF EXPERIMENT

Most literary sources provide information on the systemic effects of monosodium glutamate on the human and animal body. There are insufficient data on the effect on the large intestine.

The purpose of the work was to establish the dynamics of changes in the morphometric indicators of the structural components of the rats' cecum wall, with the long-term use of a complex of food additives: sodium nitrite, sodium glutamate and Ponceau 4R.

42 mature outbred male rats were involved into the study. The rats of control group (n=14) consumed drinking water and were administered with saline orally. The rats of the experimental group, with access to water *ad libitum*, were administered with 0,6 mg/kg sodium nitrite, 20 mg / kg monosodium glutamate and 5 mg / kg Ponceau 4R in 0.5 ml of distilled water once daily per os. The animals were sacrificed within 8, 12 and 16 weeks under thiopentone anesthesia overdose.

After animals' euthanasia, the fragments of the cecum were fixed in 10 % formalin solution. Subsequently, the pieces of the cecum were embedded into paraffin. Sections of 5-10 μm thick were obtained using the ARM 3600 microtome. After staining with hematoxylin and eosin the sections studied under the light microscope. The digital microscope, equipped with the Levenhuk D740T digital microphoto attachment, and adapted software have been used for microphotography and morphometric study. Statistical processing of morphometric data was performed using the *Excel* program.

At the 8th week of the experiment the total thickness of the cecum wall was $289,29 \pm 8,33 \mu\text{m}$, which was 18,02 % less than the control group ($p < 0,05$), and 18,88 % less than the results of the previous period of study ($p < 0,05$). We also recorded a decrease in mucosal thickness to $177,31 \pm 8,92 \mu\text{m}$, which was significantly less by 20,98% relative to controls ($p < 0,05$), and by 3,07% less than the previous period of observation. The submucosal thickness was $94,56 \pm 4,32 \mu\text{m}$, which was 58,94% greater than that of the control group, and 24,93% greater than that of the previous study term ($p < 0,05$). At the same time, there was an increase in the average thickness of the muscularis membrane to $69,99 \pm 4,43 \mu\text{m}$, which was 45,45% significantly greater than the control ($p < 0,05$), and 8,43% greater than the results of the previous period of observation. The thickness of the serous membrane was $9,39 \pm 0,44 \mu\text{m}$, which was significantly less than the control by 23,72% ($p < 0,05$) and simultaneously 32,69% greater than the previous observation period ($p < 0,05$).

At the 12th week of the experiment, the total thickness of the cecum wall of the experimental animals was $294,29 \pm 7,83 \mu\text{m}$. There was a significant decrease in wall thickness relative to the control by 16,6% ($p < 0,05$), as well as a slight decrease by 1,7% relative to the previous period of observation. The thickness of the mucous membrane at this period of experiment was $203,84 \pm 5,55 \mu\text{m}$, which was reliably less than control by 9,16% ($p < 0,05$), and by 13,02% ($p < 0,05$) - relative to the previous period of observation. The submucosal thickness was $59,25 \pm 5,72 \mu\text{m}$, it was significantly greater than the control values by 34,48 % ($p < 0,05$), and simultaneously it was 37,34 % less in relation to the results of the previous period of observation ($p < 0,05$). Thickness of muscularis decreased to $27,09 \pm 2,91 \mu\text{m}$, which was 30,86 % less than the control ($p < 0,05$), and 61,29 % less than the previous period of observation ($p < 0,05$). Serous membrane thickness increased to $10,99 \pm 0,34 \mu\text{m}$, including an increase by 13,25 % relative to control ($p < 0,05$), and by 1,56 % relative to the previous period of observation.

At the 16th week of observation, the total thickness of the rat cecum wall was $256,45 \pm 9,82 \mu\text{m}$. There was a significant decrease in wall thickness relative to control by 27,32% ($p < 0,05$), as well as by 12,86% relative to the previous

observation period ($p < 0.05$). The mucous membrane thickness reliably decreased both in comparison with control - by 12,86 % ($p < 0,05$), and in comparison with the previous period of observation - by 25,38 % ($p < 0,05$) and averaged $167,45 \pm 7,68 \mu\text{m}$. The submucous membrane thickness at the given period of observation was $58,38 \pm 1,41 \mu\text{m}$, which was 33,5% greater than in the control group ($p < 0,05$) and 1,47% less than in the previous period of observation ($p < 0,05$). Thickness of muscular casings was $29,44 \pm 2,66 \mu\text{m}$, which was 24,86 % less than in control ($p < 0,05$), and 7,98 % more than in previous period of observation ($p < 0,05$). The thickness of serous membrane was $14,19 \pm 0,14 \mu\text{m}$, its simultaneous increase by 13,25% relative to control ($p < 0,05$) and decrease by 22,55% relative to the previous period of observation ($p < 0,05$) were noted.

Thus, the use of a complex of food additives - monosodium glutamate, sodium nitrite and Ponceau-4R in a complex leads to changes in the morphometric parameters of the wall of the large intestine of rats and to violations of its structural layers, which are characterized by dystrophic-destructive changes in cells, an increase in the number of macrophages and eosinophils, which are accompanied by the development of interstitial edema with the development of an allergic reaction. Restoration of morphometric indicators due to compensatory-restorative reactions does not occur.

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NANOLEVEL BIOLOGY: INFORMATIONAL ANALYTICAL REPRESENTATIONS OF THE MAGNETOELECTROCHEMICAL THEORY OF METABOLISM, LIFE AND HEALTH

Understanding the essence of the phenomenon of biological life is one of the main unsolved questions of fundamental science. What exactly are the mechanisms and processes that make the molecules of our body alive? How exactly and at the expense of what is this happening? The answers to these questions can allow modern medical science to significantly advance, as they could discover the latest mechanisms of influence on the tissues of the human body in order to prolong their viability and the life of a person as a whole. Science of the 21st century has advanced significantly. The latest knowledge about the organization and principles

ДОСВІД ВИКОРИСТАННЯ GOOGLE CLASSROOM ЗІ ЗДОБУВАЧАМИ З АНГЛОМОВНОЮ ФОРМОЮ НАВЧАННЯ НА КАФЕДРІ ГІСТОЛОГІЇ, ЦИТОЛОГІЇ ТА ЕМБРІОЛОГІЇ	
Шешукова О.В., Мосієнко А.С., Поліщук Т.В.	125
ШЛЯХИ ПОТРАПЛЯННЯ ФТОРУ ДО ОРГАНІЗМУ ЛЮДИНИ ТА ЙОГО ВПЛИВ НА ОРГАНІЗМ В ЦІЛОМУ	
Ющук А.Л., Коржик О.В.	126
ОСОБЛИВОСТІ ГЕМАТОЛОГІЧНИХ ПОКАЗНИКІВ ХВОРИХ НА COVID-19 ІЗ РІЗНИМ ПЕРЕБІГОМ ЗАХВОРЮВАННЯ	
Яськів Н.А.	129
ХРОНІЧНИЙ РЕЦИДИВУЮЧИЙ СТОМАТИ - МУЛЬТИДИСЦИПЛІНАРНА ПРОБЛЕМА. – ЩО НЕОБХІДНО ЗНАТИ СТОМАТОЛОГУ?	
Ячмінь А.І., Єрошенко Г.А., Шевченко К.В., Улановська-Циба Н.А., Рябушко О.Б., Кінаш О.В., Клепець О.В., Соколенко В.М.	130
ЗМІНИ СУБМІКРОСКОПІЧНОЇ ОРГАНІЗАЦІЇ ФУНДАЛЬНОГО ВІДДІЛУ СТІНКИ ШЛУНКУ ЩУРІВ ПІСЛЯ ДІЇ КОМПЛЕКСУ ХАРЧОВИХ ДОБАВОК	
Aidyn Salmanov	132
HEALTHCARE-ASSOCIATED INFECTIONS AND MOLECULAR MECHANISMS OF ANTIMICROBIAL RESISTANCE OF RESPONSIBLE PATHOGENS IN UKRAINE	
Bilash S.M., Oliinichenko Ya.O., Pronina O.M., Koptev M.M., Pirog-Zakaznikova A.V., Donchenko S.V.	134
THE USE OF INNOVATIVE TECHNOLOGIES IN THE STUDY OF THE DISCIPLINE "HUMAN ANATOMY AND PHYSIOLOGY" BY BACHELORS OF NURSING WITH THE ENGLISH-LANGUAGE FORM OF EDUCATION	
Ivanchuk I.M., Nebesna Z.M.	136
EFFECTS OF AU/AG/FE NANOPARTICLES IN CHANGES OF THE CEREBRAL CORTEX STRUCTURE UNDER THE CONDITION DMH-INDUCED COLON ADENOCARCINOMA <i>IN SITU</i>	
Kinash O.V., Yeroshenko G.A., Shevchenko K.V., Slipchenko L.B., Lysachenko O.D., Pandey H.	138
MORPHOMETRIC CHARACTERISTICS OF THE RAT'S CECUM WALL IN CONSUMPTION OF THE COMPLEX OF FOOD ADDITIVES IN LAST TERMS OF EXPERIMENT	
Mintser Ozar P., Potiazhenko Maksim M., Vainores Alfonsas, Bumblite Inga B., Nevoit Ganna V.	140
NANOLEVEL BIOLOGY: INFORMATIONAL ANALYTICAL REPRESENTATIONS OF THE MAGNETOELECTROCHEMICAL THEORY OF METABOLISM, LIFE AND HEALTH	
Oliinichenko Ya.O., Bilash S.M.	142
COMPARATIVE MORPHOLOGY OF THE ILEUM	