Description Of The Dynamics Of Morphological Changes In The Liver And Small Intestine Of Laboratory Animals Under Acute Irradiation

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ABSTRACT

Acute irradiation-depends on the frequency and duration of ionizing radiation, develops to a different extent depending on the radiation sensitivity of the organs. In acute irradiation, the most sensitive organs are members of the immune system (thymus, bone marrow, spleen, lymph nodes), mucous membranes of the gastrointestinal tract, exoskeletal and endocrine glands (pituitary, thyroid gland, adrenal gland), sex glands (ovaries, testes, prostate gland). Members with low sensitivity to radiation include the heart, kidneys, liver, head and back muscles, bone tissue, joints [2].

In the process of irradiation, the biological tissue membrane is in a state of destabilization: an increase in membrane permeability leads to increased activity of freely located proteins in the cytoplasm due to the abundant penetration of fluid into the cell and various micro - and Macroelements, includingsiysium ions, damage to intracellular structures of lysosomal enzymes, and the development of hydropic dystrophy in the epithelium of

Exactly as a result of venous fullness in the liver tissue, hypoxia of hepatocytes leads to the development of large, medium and small drop fatty dystrophy [5].

Keywords: Liver, organs

The purpose of the study was to characterize the dynamics of morphological changes in the state of biocorrection in laboratory animals jigari and small intestine in acute irradiation.

Material and methods. For experimental studies, 60 White breeds of rats weighing 160-180 g, of the male gender, were selected. All laboratory animals were taken from one vivarium and at the same age. All were stored in standard vivarium conditions (temperature 21-220S, humidity 50-60%, light mode light and darkness from 12 hours). laboratory animals in the conditions of vivarium, care, compliance with biological safety rules and ethical principles when working with themA. and co-founder. Implemented on [1, 6].

All laboratory animals were divided into the following groups:

1-Group-Non-biocorrected white-breed ratsushlar with a standard vivarium ration, receiving a one-time acute irradiation in the amount of 5 Gray (n=15);

2 - Group-white non-bred rats with the addition of the biologically active additive "Lactopropolis-AWL" as a biocorrection to the standard vivarium ration, receiving a one-time acute irradiation in the amount of 5 Grayushlar (n=15);

3 - group-intakt white non-breed rats that did not receive acute radiation, which were in the standard vivarium rationushlar (n=30).

In the experiment, irradiation of laboratory animals was carried out using gamma-therapeutic apparati agat-R1 (Estonia), in which the source of radiation was so-60. Research on animal irradiation was conducted at the branch of the Republican specialized oncology and oncology scientific and practical

center of the National Academy of Sciences of Uzbekistan Bukhara.

The drug" Lactopropolis-AWL " was given every morning, due to the weight of all laboratory animals. For those who received acute irradiation, the drug was given for 20 days, irradiated on the last day, and then on 5-th day, respectively, morphological studies were performed.

The composition of the biologically active additive" Lactopropolis-AWL "consists of an extract of Lactobacillus rhamnosus 925, probiotic bacteria of Enterococcus durans and biologically active compounds of propolis, which have antimicrobial, immunostimulating, anti-inflammatory properties (the product of the Institute of Microbiology of UZR FA and" AllWellLab " LLC).

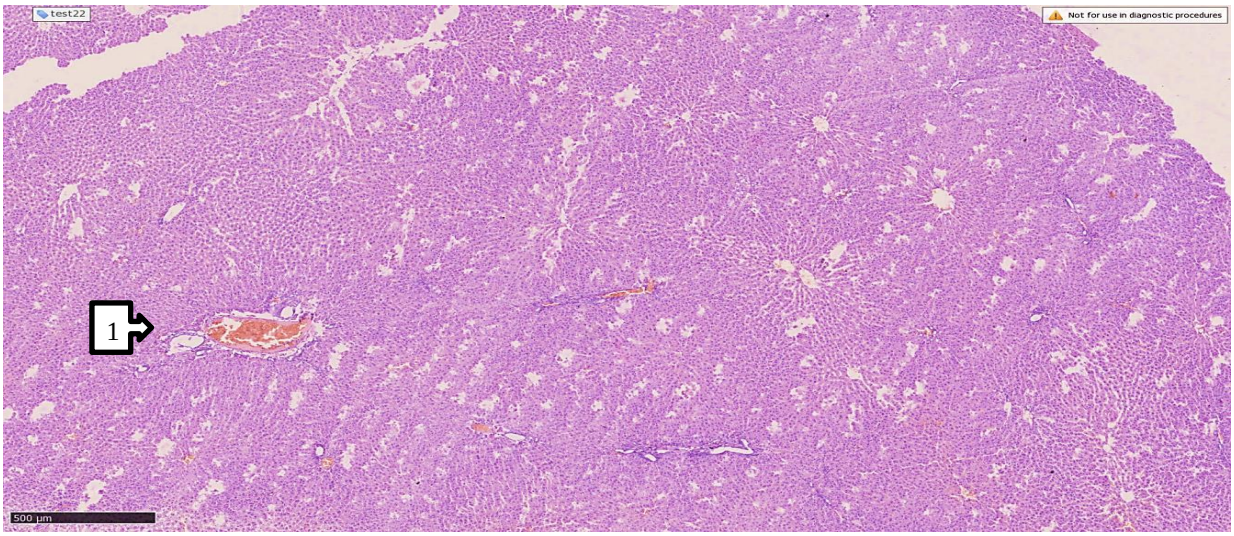
In order to study the morphological parameters of laboratory animals jigari and small intestine, widely used methods were used in experimental studies (anatomical rupture). All histological microobjects were seen using the trinocular microscope (China) of the HL-19 model with software. The preparation of histological preparations from squid and small intestine without white specimens consisted of 4 stages and was carried out in conventional methods. For the preparation of preparations, a mechanical rotational Microtome of the brand YD-315 (China) was used, the prepared cuts were smeared with hematoxylin-eosin. Taking pictures of micropreparations was carried out on a microscope in the dimensions 4x10, 10x10, 20x10, 40x40, 60x10, 80x10.

Statistical processing of the resulting material was carried out directly using the Excel 7.0 General Data Matrix. Statistical processing of the data obtained was carried out by calculating the following parameters: mean arithmetic (M), mean arithmetic error (m), standard deviation, confidence interval. Evidence-based medical principles were used in the organization and conduct of the study.

Results and their discussion. Various internal and external effects have been identified as a result of changes in its structure along with the functional state of the liver. Since the changes in the irradiation effect were poorly studied in a comparative manner, the morphological properties of the liver under the influence of acute irradiation were studied and analyzed.

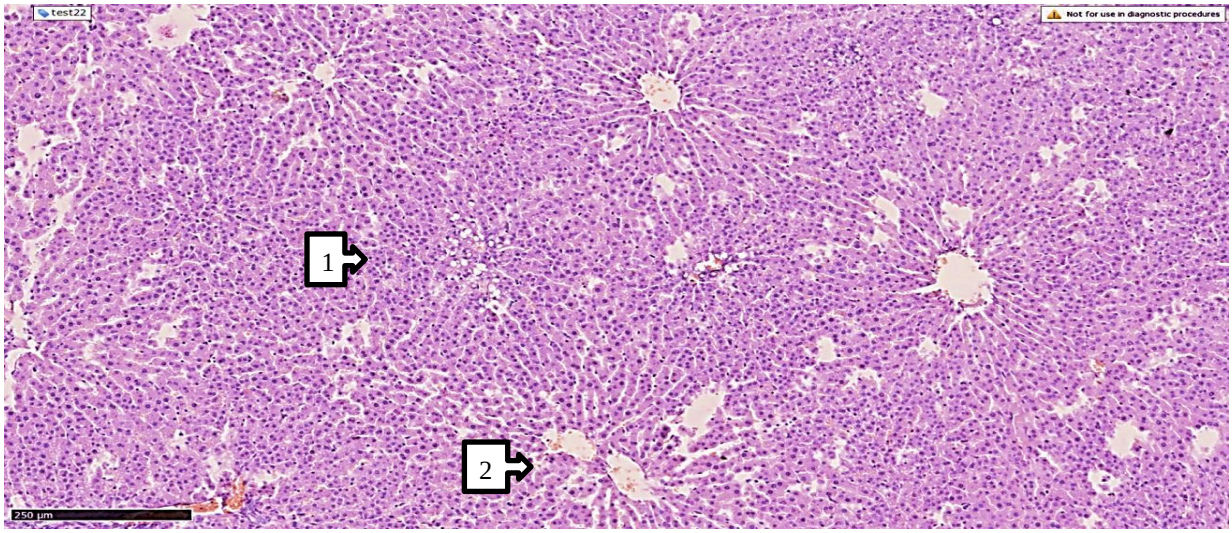
Since intact laboratory animal jigari morphology has been cited in many scientific research studies [9], we have not studied the morphological structure of the liver within the framework of the norm.

The results obtained showed that in all laboratory animals of Group 1 (100,0%, n=15), the fragmented structure of liver tissue did not change in the general background, the triada was found to have a venous vascular full-fledged appearance (100,0%, n=15) (Figure 1).



1-picture. Histological appearance of rats with white pedigree who received acute irradiation (fragmented structure unchanged against the general background of liver tissue, triada vein blood vessel full-fledged appearance (1). Hematoxylin-painted with eosin, 4x10).

When another histological drug from the rat liver without white blood cells of the same group was seen on a microscope, fat dystrophy foci were detected in hepatocytes around the triads in the liver (86,7%, n=13), as well as sinusoidal cavities around the central vein (86,7%, n=13)

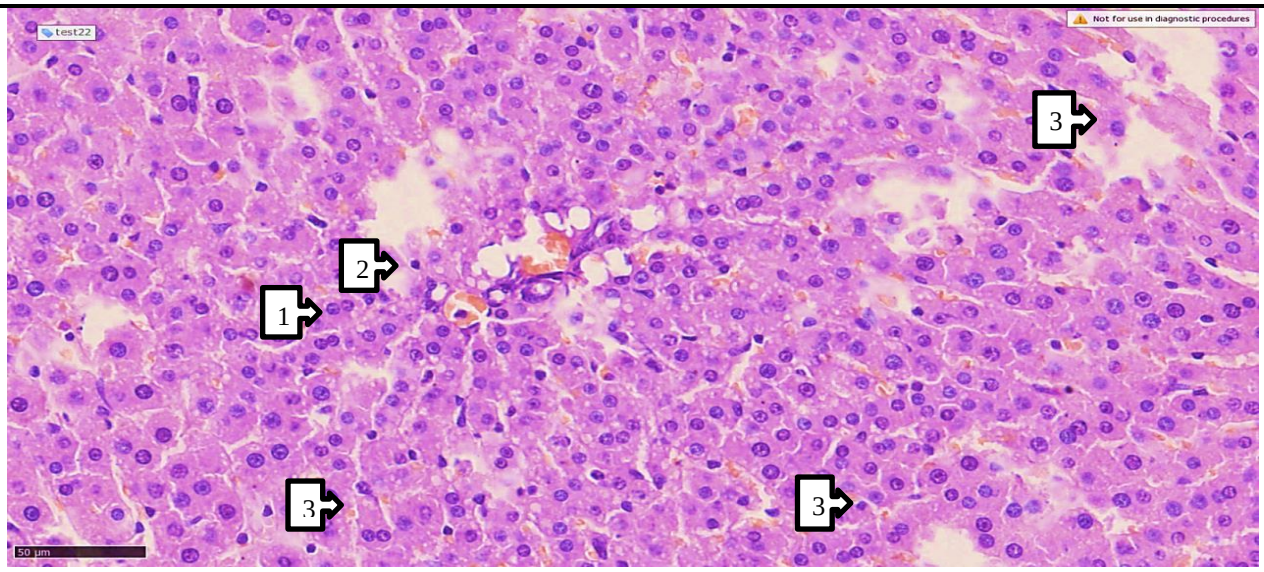


(Figure 2).

2-picture. Histological appearance of rats with white offspring who received acute irradiation (in hepatocytes around triads, fatty dystrophy foci are detected (1). Central venous atrophy sinusoidal cavities kengaygan (2). Hematoxylin-painted with eosin, 10x10).

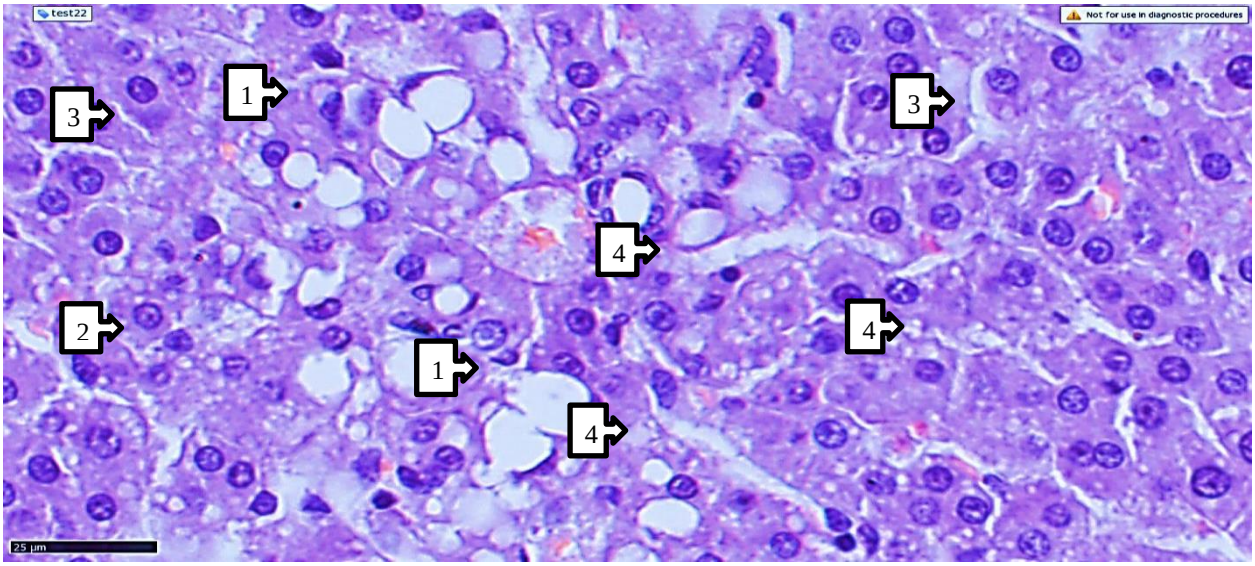
In other histological drugs, the results of the study of Kupfer cells in the liver of laboratory animals belonging to the same group are presented. It is known that the Kupfer cells are formed from the monocytes of the circulating bone marrow, forming 20% of the cells in the liver, which are located within the sinusoids of the liver and are attached to the sinusoidal endothelial cells that form the wall of the blood vessels [8]. It was found that around the Triads, Kupfer cells were migrating (80,0%, n=12), large steatogepatocytes were detected around the periportal veins (86,7%, n=13). Their detection showed that against the background of fatty dystrophy in the liver there was an inflammatory process. Also, there were observed the presence of numerous monocellicular necrosis foci (73,3%, n=11) in hepatocytes (Figure 3).

Monocellular necrosis (celular - fat) – the location of hepatocytes, which are exposed to necrosis, is occupied by flatteners, is often observed in the liver, the cause of which is fatty dystrophy and necrosis of the liver.



3-picture. Histological appearance of rats with no white breed receiving acute irradiation (1), large steatogepatocytes (2), numerous monocellicular necrosis foci (3) were detected around the periportal veins (2), migrating Kupfer cells around the Triads. Painted with hematoxylin-eosin. The 40x10.)

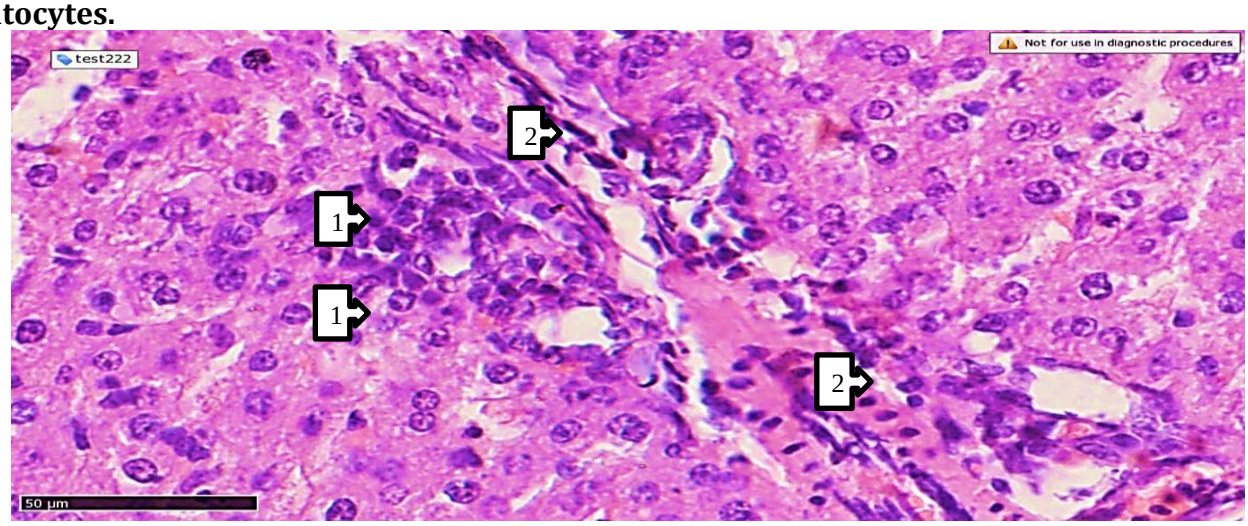
Continuing the study of histological drugs, in one of them fokus, large fat cells, silcigan hepatocytes with nuclei to the periphery were detected, at the same time focal focal focal foci of hepatocytes, which were exposed to gidropic dystrophy (66,7%, n=10), the remaining hepatocytes were exposed to medium-and small-fat dystrophy. It is known that gidropic dystrophy is the appearance of vacuoles filled with cytoplasmatic fluid in these hepatocytes. Perisinusoidal cavities (Disse cavities) are of the same width (Figure 4), and in the field of vision they are almost exactlylanm (93,3%, n=11).



4-picture. Histological appearance of rats with white pedigree receiving acute irradiation (fokus large flattened hepatocytes, silcigan nuclei to the periphery (1), hepatocytes with hydropic dystrophy focal furnace (2), hepatocytes with medium and small fat dystrophy (3), sinusoidal cavities of different width (4), Disse cavities are almost pronounced. Painted with hematoxylin-eosin. 80x10).

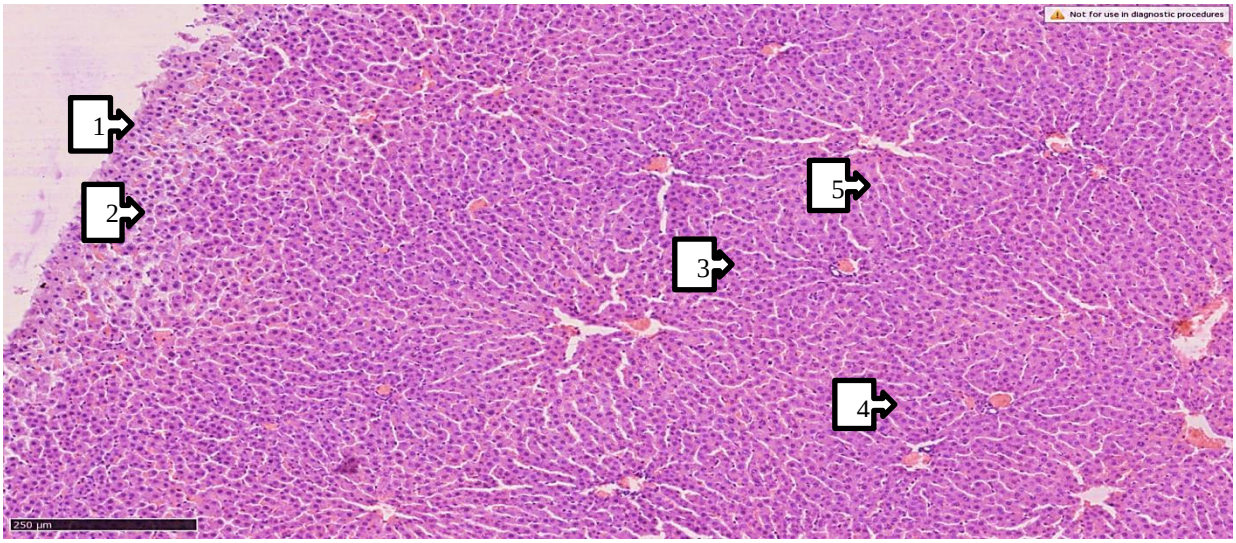
Perisinusoidal spaces (Disse spaces) are a narrow space between the walls of hepatocytes and sinusoid capillaries in the hepatic compartment, the width of which is equal to 0,2-1,0 μm. In the Disse cavity, metabolism takes place between the hepatocytes and the blood plasma, it is also permissible to mention that in this cavity there are also itu cells involved in fibrogenesis [7].

In the next histological preparation of rat liver without white blood cell undergoing acute irradiation presented, migration of Kupfer cells around the peripheral vein blood vessel (80,0%, n=12) was observed, phagocytosis (66,7%, n=10) by Kupfer cells of Necrosis-Infected hepatocytes.



5-picture. Histological appearance of rat liver without white blood cell receiving acute irradiation (migration of Kupfer cells around the peripheral vein (1), necrosis of hepatocytes exposed to phagocytosis by Kupfer cells (2). Painted with hematoxylin-eosin. 80x10).

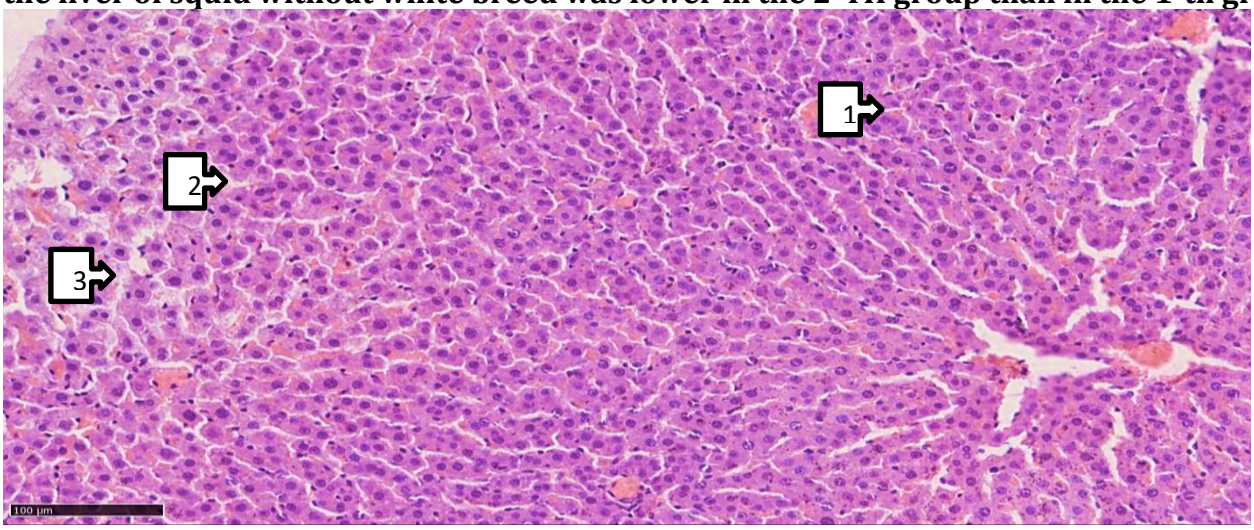
When the histological appearance of squidig jigari without white breed, which received the biologically active additive "Lactopropolis-AWL" before acute irradiation, was studied, it was found that most of them had the same thickness of liver tissue, capsule, clearly described reparative regeneration in subcapsular hepatocytes, the fragmented structure remained unchanged (100,0%, n=15). Uneven filling in the central veins, sinusoidal cavities around them were detected kengayg with a small amount (26,7%, n=4) (Figure 6).



6-picture. Histological appearance of rats with white offspring who received biopreparate before acute irradiation (liver tissue, capsule of the same thickness (1), reparative regeneration in subcapsular hepatocytes (2), segmental structure unchanged (3), uneven

fullness in central veins (4), sinusoidal spaces around the trades kengaygan (5). Hematoxylin-painted with eosin, 4x10).

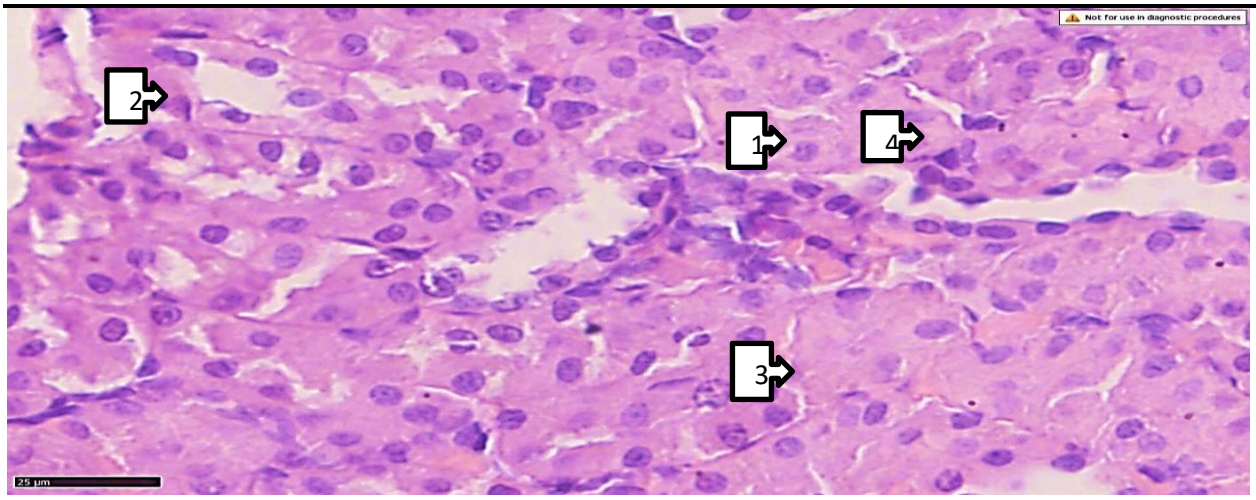
When the morphological (histological) appearance of rats with no other white breed belonging to the same group was studied, liver tissue, uneven saturation in the central vein, monocellicular necrosis (53,3%, n=8) in centrolobular hepatocytes, drop-shaped fat dystrophy foci (46,7%, n=7) in hepatocytes were detected from the chap in Figure 7 (Figure 7). As can be seen from the results obtained, the intensity of exposure to negative morphological changes in the liver of squid without white breed was lower in the 2-TH group than in the 1-th group.



7-picture. Before acute irradiation, histological manifestations of rats with white pedigree who received biopreparate (hepatic tissue, uneven saturation in the central vein (1), monocellicular necrosis in centrolobular hepatocytes (2), dystrophy foci with a drop of hyaline, formed quietly in hepatocytes from the top of the chap, are detected (3). Paint G-E. It's 10x10.

Similar results were also observed in rats without other white breeds belonging to the 2nd group. For example, in the histological preparation under consideration (Figure 8), migration of Kupfer cells around the Triads (60,0%, n=9), apoptosis process in dystrophic altered hepatocytes and deformation of the nuclei (60,0%, n=9), narrowing of the sinusoidal cavities (66,7%, n=10) and fullness in the vessels of the peripheral vein were observed.

For the purpose of comparison with laboratory animals that did not receive biopreparate before acute irradiation (Group 1), we recognize that the following changes in the morphological characteristics of Group 2 animals were observed: "capillarization process" or "sinusoid capillarization phenomenon" (60,0%, n=9), most hepatocyte nucleus hyperchromia (60,0%, n=9), reparative regurgitation the process kuchaygan (93,3%, N=14) is also the same width around the sinusoidal spaces hepatitis (66,7%, N=10, sinusoidal voids were observed in the area with necrosis in hepatocytes (53,3%, n=8) (Figure 9).



From the results obtained, it can be seen that after acute irradiation in both groups, significant morphological changes were observed in the animal liver of the laboratory and morphological changes in the 2-TH Group, in which pre-biocorrection was performed, were low in intensity. Hence, the morphological changes of the liver in the influence of acute irradiation in rats without a white breed, which received the biologically active additive" Lactopropolis-AWL", were not evident in all animals, which in turn proved the effectiveness of this biopreparate and became the basis for its recommendation for its use for prophylactic biocorrection purposes.

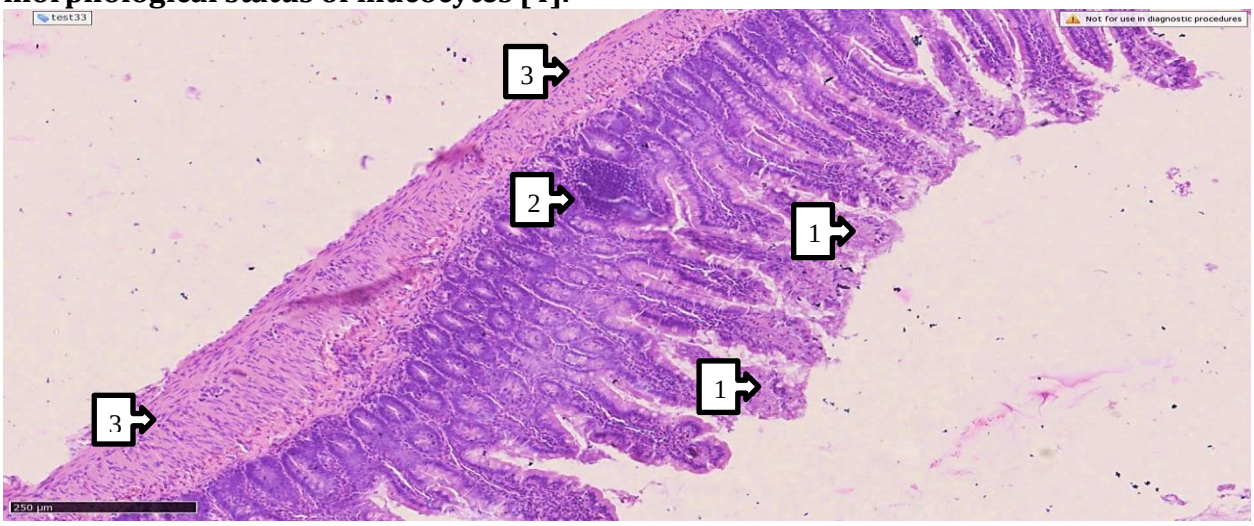
At a later stage of our work, studies with the liver were also studied in the small intestine of white breed rats (Group 2) who did not receive biopreparat (Group 1) and received biopreparat (biological active supplement"Lactopropolis-AWL").

As it turned out, in rats without white offspring belonging to the first group, the histological structure of the small intestine was unchanged, mucous larvae were of the same appearance (100,0%, n=15) (Figure 10).

10-picture. Histological appearance of the small intestine of rats without white breed receiving acute irradiation (histostructure unchanged, mucous larvae look the same. Hematoxylin-painted with eosin, 4x10).

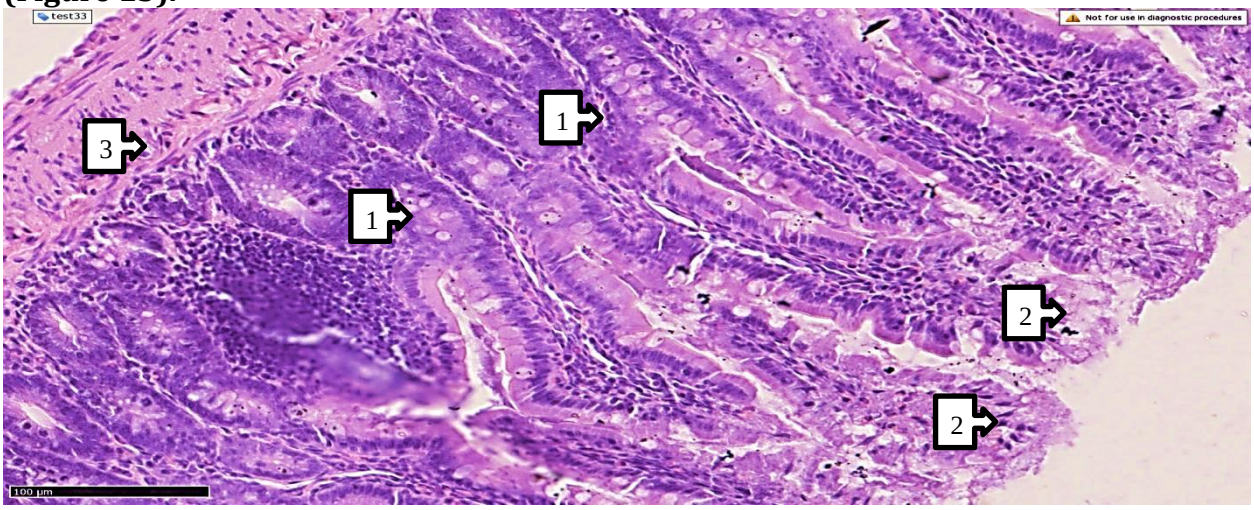
When another histological drug was studied, white non-breed rats receiving one-time acute irradiationushlar were detected foci of necrosis of mucocytes on the surface of vorsinki of the mucous membrane of the small intestine (66,7%, n=10), hyperplastic change in the germinative area of the malt structure was shown to be sluggish (53,3%, n=8), serous curtain was of the same thickness.

As you know, goblet cells (mucocytes), one of the types of enterocytes, account for 9,5% of epithelial cells. These cells contain mucinogen granules, which, in turn, absorb water and swell and turn into mucin. Therefore, it is important to study and evaluate the structure, morphological status of mucocytes [4].



11-picture. Histological appearance of the small intestine of rats without white breed receiving acute irradiation (detected foci of necrosis of many mucocytes on the surface of the mucous membranes of the small intestine (1), hyperplastic changes in the germinative sac of the malt structure formed stagnant (2), serous curtain with a different thickness (3). Hematoxylin-painted with eosin, 10x10)

In another histological preparation, it was found that the goblet cells located in the intestinal vorsinki in the field of vision (Figure 12) were of different sizes, there were many focal necrosis foci in mucocytes (66,7%, n=10), fibrinoid suppuration foci were observed in the stroma of the muscle layer (46,7%, n=7).
At the same time, a slow-growing proliferation (80,0%, n=12) was observed in lymphocytes detected in the lymphoid follicle of the small intestine, while in the paraffollicular capillaries, the foci of anemia (86,7%, n=13) were detected, hypersecretion and cytoplasm of the gland cells surrounding the follicle on the mucous membrane was determined basophilic staining (Figure 13).



When the histological landscape of the small intestine of white non-breed ratsushlar, which received the corresponding dose of the biological active additive "Lactopropolis-AWL" once a day before acute irradiation was conducted, changes in the morphological

properties of the small intestine were observed in most of them, but the intensity of these changes was lower than that of white non-breed rats This case is presented in Table 2 based on the numbers.

Conclusions.

1. Fat dystrophy foci (86,7%), sinusoidal cavities at the periphery of the Central vena cava (86,7%), migration of Kupfer cells to the periphery of the Triads (80,0%), large steatogepatocytes around the periportal veins (86,7%) were detected in the hepatocytes around the triads in the white non-bred rat liver of the 1st Group, which received acute irradiation and did not undergo biocorrection. Their detection showed that against the background of fatty dystrophy in the liver there was an inflammatory process.

2. In the histological preparations of animals of this group, a focal focus of hepatocytes was also observed in hepatocytes, which suffered many monocellular necrosis foci (73,3%), hydropic dystrophy (66,7%), Disse spaces are almost clearly visible on the field of vision (93,3%).

3. Migration of Kupfer cells (80,0%) around the periportal vein of rats without white offspring undergoing acute irradiation was observed (66,7%, n=10) with phagocytosis by Kupfer cells of Necrosis-Infected hepatocytes.

4. When the histological appearance of squidig jigari without white breed, which received the biologically active additive "Lactopropolis-AWL" before acute irradiation, was studied, it was found that most of them had the same thickness of liver tissue, capsule, clearly described reparative regeneration in subcapsular hepatocytes, the fragmented structure remained unchanged. Sinusoidal cavities around the central veins were detected in relatively small amounts (26,7%, n=4).

5. In order to compare with laboratory animals that did not receive biopreparat before acute irradiation (Group 1), the following changes were observed in the morphological characteristics of Group 2 animals: "capillarization process" (60,0%) around hepatocytes, the majority of hepatocyte nuclei were hyperchromous (60,0%), the reparative regeneration process kuchaygan (93,3%), sinusoidal cavities were observed in the same width around the hepatitis 66,7%), sinusoidal voids were observed in the area with necrosis in hepatocytes (53,3%).

6. After acute irradiation in both groups, significant morphological changes were observed in the laboratory animal liver, and morphological changes were low in the 2nd group, where pre-biocorrection was performed. Hence, the morphological changes of the liver in the influence of acute irradiation in rats without a white breed, which received the biologically active additive" Lactopropolis-AWL", were not evident in all animals, which in turn proved the effectiveness of this biopreparate and became the basis for its recommendation for its use for prophylactic biocorrection purposes.

7. Single-time acute irradiation received White undigested squidushlar necrosis foci of mucocytes on the surface of the mucous membrane of the small intestine vortices were detected (66,7%), hyperplastic change in the germinative sac of the malt structure was shown to be sluggish (53,3%), the serous membrane was of the same thickness, the goblet cells located in the intestinal vortices were of soaking furnaces were observed (46,7%). In lymphocytes of the same member lymphoid follicle, underdeveloped proliferation (80,0%), in paraffollicular capillaries, anemia foci (86,7%) were detected.

8. Laboratory animals developed proliferation of fibroblasts (66,7%) in the stroma of the small intestine vortices, dystrophic and necrotic foci in secretory producing cells (53,3%), necrotic-erosive changes in the mucocytes on the surface of the vorsina were detected (53,3%).

9. When histological preparations made from the White undigested squidushlar thin intestine, which received the corresponding dose of the biologically active additive "Lactopropolis-AWL" once a day before acute irradiation, vorsinas were detected as full-fledged, interstitial tumors in the stroma (33,3%), uneven intermediate tumors in the serous membrane (46,7%). Foci of gidropic

dystrophy were detected (40,0%) in mucocytes on the surface of vorsinka, fibroblasts proliferation kuchaygan (40,0%) was observed in vorsinka stroma.

10. When the histological landscape of the small intestine of white non-breed ratsushlar, which received the corresponding dose of the biological active additive "Lactopropolis-AWL" once a day before acute irradiation was conducted, changes in the morphological properties of the small intestine were observed in most of them, but the intensity of these changes was lower than that of white non-breed rats

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