Enterobacteriaceae, and in 17.4% and 68.5% of *Enterobacter* spp. and *K. pneumoniae* isolates, respectively. Antimicrobial resistance to carbapenems was detected in 64.7% of all nonfermentative, Gram-negative bacteria, and was most common among *Acinetobacter* spp. (71.7%), *S. maltophilia* (56,7%), and *P. aeruginosa* (24.7%).

The prevalence of extended-spectrum β-lactamase (ESBL)-producing bacteria in Ukrainian hospitals was 36.1%. Among ESBLs *bla*TEM was the commonest genotype (41.7 %), followed by *bla*SHV (33.9 %), and *bla*CTX-M (35.7 %) either alone or in combination. Most ESBL genes were identified among *Enterobacteria*, including *K. pneumoniae* (73.6%), *E. coli* (47.9%), *E. cloacae* (44.7%), *P. mirabilis* (42.6%) and *S. marcescens* (39.4%) and *E. aerogenes* (23.8%). The OXA-type ESBLs have been found mainly in *P. aeruginosa* (38.7%) and *A. baumannii* (27.1%). Non-fermenting Gram-negative *A. baumannii*, and *P. aeruginosa* had of the ESBL genes, 8.7% and 6.9%, respectively. In this study, AmpC-type β-lactamases were isolated from extended-spectrum cephalosporin-resistant Gram-negative bacteria (25.1%), including *E. aerogenes* (35.3%), *A. baumannii* (32.7%), *E. cloacae* (31.8%), *S. marcescens* (31.4%), *P. mirabilis* (25%), *K. pneumoniae* (20.7%), *P. aeruginosa* (20.7%), and *E. coli* (16.1%). The prevalence of carbapenemases among MDROs in Ukrainian hospitals was 31.7%. VIM (Verona integron-encoded metallo-β-lactamase) and KPC-type carbapenemases were detected in 20.2% and 25.7% of isolates, respectively. OXA (oxacillinase) group of β-lactamases and NDM-1 (New Delhi metallo-β-lactamase) were detected in 29.7% and 21.3% of isolates, respectively. *bla*IMP-1 were detected in 5.7% of *P. aeruginosa* isolates.

Of the 51656 isolates (including patient with HAI, environmental and HCWs' hand) tested, 33.7% were found to be multidrug-resistant. By PCR amplification, it was found that 36.9% of the samples MDROs showed the presence of β-lactamases genes. A diversity of acquired resistance β-lactamases genes was found, including the AmpC, *bla*KPC, *bla*NDM-1, *bla*CTX-M, *bla*OXA-1, *bla*OXA-10, *bla*OXA-20, *bla*OXA-23, *bla*OXA-24, *bla*OXA-30, *bla*OXA-40, *bla*OXA-48, *bla*OXA-51, *bla*OXA-58, *bla*OXA-143, *bla*SHV, *bla*SIM, *bla*TEM, *bla*IMP-1, *bla*VIM-1, and *bla*VIM-2.

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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

Improvement of the educational process in medical establishments is currently impossible without using innovative forms of education. Among them, the use of information technologies, which allow access to global information resources, has become particularly important today; it reduces the dependence of teaching and learning on the location of the process participants; accelerates globalization; contributes to improving the forms and content of the educational process, increasing the efficiency of assimilation of educational material and individualization of education, integration of academic, research and production activities; significantly increase the number of resources that students can use outside the classroom; contribute to improving the motivation to study and the development of creative thinking.

Internet resources allow you to actively and promptly get acquainted with the news of world medicine, to find helpful information and materials that are freely available and can be used in the educational process. Furthermore, modern multimedia technology allows you to display educational materials from a personal computer on the screen, which is very convenient during classroom classes with students.

At the Department of Anatomy with Clinical Anatomy and Operative Surgery, 3D programs are widely used for studying human anatomy, makings it possible to consider each organ or system of the human body separately and in combination with others. Teachers recommend students to work with such programs, provide links for their search on the Internet, develop personal tasks for students, and work on which involve the active use of 3D programs. U

sing these programs makes it possible to obtain images distributed by departments and anatomical systems; consider 3D models of anatomical structures and their parts; anatomical objects can move simultaneously: spin, bend, hide, etc. In addition, there are many electronic anatomical atlases.

When you click on various pages, their names appear in English and Latin with the possibility of sounding, which helps to learn the correct pronunciation; available reference materials on different anatomical objects. In particular, some anatomical atlases make it possible to study the anatomical features of organs and demonstrate their functioning, which is especially important when studying the discipline "Human Anatomy and Physiology." A visual demonstration of movements and principles of functioning allows an understanding of how the human body works more deeply.

Thus, the use of modern information technologies today has become an integral part of the educational process, without which it is difficult to imagine a

full-fledged study by nursing bachelors of academic disciplines, in particular anatomy and physiology, in medical institutions.

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EFFECTS OF AU/AG/FE NANOPARTICLES IN CHANGES OF THE CEREBRAL CORTEX STRUCTURE UNDER THE CONDITION DMH-INDUCED COLON ADENOCARCINOMA *IN SITU*

Modern medicine struggles with numerous illnesses, but cancer has been a number one enemy for modern scientists for many years. Colorectal cancer (CRC) takes 2nd place in mortality because of malignant neoplasms. CRC is always accompanied by chronic endotoxicosis, leading to severe changes in homeostasis. All of these lead to structural and functional changes in different organs, and the central nervous system is especially vulnerable. Nanotechnology-based therapy is a new strategy in cancer treatment.

Aim of research. To investigate morphological changes of the cerebral cortex under the condition of DMH-induced colon adenocarcinoma *in situ* and the influence of Au/Ag/Fe nanoparticles composition as correction method.

The study was performed on mature outbred white male rats, divided into two groups: 30 control animals and 60 animals with modeled colorectal adenocarcinoma in situ. CRC was modeled with the injections of DMH (N, N-Dimethylhydrazine, Sigma-Aldrich, N D161608) once a week for 30 weeks subcutaneously. After realization of the experiment and histological verification of development colon adenocarcinoma *in situ* 30 of injured animals received nanoparticles Au/Ag/Fe (d=30 nm; in 1 ml: 1,6 mg Ag; 0,1mg Fe; 3,088 mcg Au) intragastrically for 21 day. We collected pieces of the parietal area of the somatosensory cerebral cortex (fields 1-2) to investigate the microscopic and submicroscopic structure. All histological samples were made according to conventional methods and were studied using a SEOSKAN light microscope and an electron microscope PEM-125K.

We identified significant microscopic changes in ganglionic and pyramidal cortex layers neurons in animals with DMH-induced colon adenocarcinoma *in situ.* "Dark", "intensely dark" and "light" (hypochromic) neurons were found in the cortex of injured animals. "Dark" and "intensely dark neurons had thinned processes, reduced bodies, osmophilic neuroplasm, and karyoplasm. Nuclei were