Физико-химическая биология как основа современной медицины:
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Pyatchanina T.V.[1], Klyuchko O.M.[2], Mazur M.G.[1]

Using of contemporary methods of medical microimages automatic processing in practical oncology

[1] RE Kavetsky Institute of Experimental Pathology, Oncology
and Radiobiology of National Academy of Sciences of Ukraine, Kiev,
Ukraine

[2] National Aviation University, Kiev, Ukraine

Pathohistological studying of tissues' sections of postoperative tumors' material or tissues' biopsy material is a "gold standard" for malignant neoplasm's (MN) diagnosis; it is also important for both clinical and pathological correlation and prognosis. Morphological studies are the basis for diagnosis' verifications, predicting of tumors' behaviors, therapy prescribing after the examination of cells' types, degree of their differentiation, mitotic activities, microscopic lymph vascular invasions, metastasis, nature of tumors' microenvironments, size of tumors, and presence of necrosis. Therefore, diagnosis and classification of breast cancer (BC) and prostate cancer (PC) are complicated processes that require careful analysis and accuracy of pathologists. Process of histological samples' preparation is labor-intensive; it is characterized by the variability of quality and types of protocols for techniques, reagents in different laboratories. Digital images processing is one of mainstreams in progress of medical microphotography data analysis aimed on the increase of decision-making reliability in clinical practice. Thus an improvement of diagnosis and prognosis of MN by computer automation of images' analysis using modern bioinformatics tools is important task indeed due to the possibility of highly precision results obtaining and, consequently, more early pathologies' revealing. Different types of methods like cluster analysis, algorithms of artificial neural networks (ANN) trainings, ANN methods, other mathematical methods in bioinformatics are prospective also for tasks' performing in processes of cytological, histological, immune histological, immune cytological analysis of images during BC and PC in contemporary clinical practice. Starting works in direction of tumors' sections images processing with consequent analysis using contemporary cluster methods the authors would like to present some obtained results with further their discussion. For today, we have started already the development of automatic methods which would be the parts of the software for automatic diagnostics and prognosis of BC and PC. The first part of this works would be based on segmentation procedures of H&E-stained images with $40\times$ and $100\times$ magnification. The second part of this works have to be the development of ANN and convolution neural network methods (CNN) and strategies which will be based on the mathematical algorithms, mechanisms, methods, procedures and practical func-

tion for achieving the mains goals and purposes of the software in practical medical and laboratory institutions of oncological profile.