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**МАТЕРІАЛИ  
З НАУКОВО-ПРАКТИЧНОЇ КОНФЕРЕНЦІЇ  
З МІЖНАРОДНОЮ УЧАСТЮ  
"МЕДИЧНА СИМУЛЯЦІЯ-  
ПОГЛЯД У МАЙБУТНЄ"**



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## **DIGITAL TOOLS FOR HISTOLOGY CLASSES**

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Clinical thinking and practical competencies of medical students are always based on a robust foundation of theoretical knowledge, despite the type of specialization they're obtaining. Higher medical institutions need to deliver theoretical subjects, especially in morphological fields, interactively and comprehensively, with diverse clinical correlations. This matter is of specific importance for the initial years of studies, when students enroll in a Histology, Cytology and Embryology discipline at BSMU. Moreover, the need for digital tools in morphological disciplines is acutely needed during remote and blended types of learning. Ukrainian experience in providing medical education in times of pandemic and aggressive full-scale invasion has proved its importance. Therefore this work aims to discuss digital tools for conducting practical classes in morphological disciplines, especially Histology, for first and second-year medical students.

A virtual laboratory is a digital tool that allows Morphological Departments and Scientific Laboratories to store their histological specimens in a digital format with a high resolution. Digital versions of histological slides can be further used for a variety of academic purposes, including tissue theoretical analysis during practical classes or lectures (on both tissue and cellular levels of organization); applying labels on digital slides for students' interpretation and individual learning; as an assessment tool for biopsy interpretation skills evaluation. Besides virtual laboratories, there exists a variety of virtual histological atlases that allow students to get acquainted with other universities' histological databases and compare different types of tissue processing. Studying histological material through virtual histological databases allows students to analyze samples with special types of stainings, as well as additional methods of microscopy. This is of high importance for institutions that are not equipped with scientific laboratories or during remote

learning when microscopic equipment is not accessible. Another digital tool for morphological classes is live broadcasting systems that allow medical educators to share clinical cases or archive material from the microscope through video systems to the webinar synchronously. The Department of Histology, Cytology and Embryology has an experience implementing this tool during remote learning due to pandemic restrictions. Sharing biopsy materials slides that have been preceded with classical and special stains, enhances clinical thinking and interdisciplinary correlation, especially given that there is no previously composed database with answers. This tool has additional benefits for students' education: it expands the variety of histological material for examination during classes and the experience of practical skills in tissue analyses. Since students are often limited by tissue material (slides) available at the Department, digital Histology tools assist medical educators in providing diverse demonstration material in all covered topics.

To conclude, theoretical subjects in higher medical institutions can diversify and modernize educational approaches by using digital facilities. For morphological subjects, especially Histology, these may include virtual laboratories and atlases that enrich students' experience in tissue examination and clinical thinking.

## **EXPERIENCE IN DEVELOPING AND IMPLEMENTING MODULES ON INNOVATION AND ENTREPRENEURSHIP IN HEALTHCARE**

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Contemporary higher medical education is facing considerable changes due to intensive innovations in healthcare technologies. Besides acquiring profound knowledge of clinical skills and competencies, young professionals need to expand their vision in career proceedings. BSMU has gained a unique experience in presenting and implementing both an offline and online course on entrepreneurship in healthcare for senior medical students and academic staff in the 2023-24 academic year.

Since 2022 BSMU has been a partner of the "HEI Innovation for Knowledge Intensive Entrepreneurship" project [1], a consortium which aims to develop opportunities for young generations in Ukrainian universities to expand practical skills in brainstorming, pitching their ideas and implementing them in start-ups. This project has gathered HEIs (higher educational institutions) of medical and non-medical specialities in Ukraine and EU countries for better higher education and their integration into entrepreneurship collaborations. The HIVE project aims