

<b>Study program:</b> Integrated Academic Studies in Medicine
<b>Course title:</b> Microscopic Laboratory Techniques in Medicine
<b>Teacher:</b> Dušan M. Lalošević, Ivan Đ. Čapo
<b>Course status:</b> elective
<b>ECTS Credits:</b> 3
<b>Condition:</b> Histology and embryology
<b>Course aim:</b> Students will get acquainted with techniques of making histological preparations for microscopic examination
<b>Expected outcome of the course:</b> <b>Knowledge:</b> Main postulates of laboratory work, selection of microscopic fixative when working with biological materials, methods of processing biological materials intended for microscopic examination, including specific features of particular simple and complex staining methods, tissue cultures in laboratory medicine, pathology of laboratory animals, norms and disease prevention when working with laboratory animals <b>Skills:</b> Laboratory work with biological materials with special emphasis on accident prevention, preparation of laboratory solutions, preparation of native and vital microscopic specimens, fixation and further processing of the different tissue samples (rinsing, dehydration, inclusion, moulding), the use of microtome, staining of microscopic preparations, working with laboratory animals, preparation and maintenance of tissue cultures, techniques of post mortem examination on laboratory animals
<b>Course description</b> <i>Theoretical education</i> <ol style="list-style-type: none"> <li>1. Microscopes, history, types</li> <li>2. Classification of toxins according to WHO and prevention of poisoning and other accidents in the histology laboratory</li> <li>3. Methods of tissue fixation, selection of fixative for light and electron microscopy</li> <li>4. Blood and tissue smears and impressions, cytological features of particular samples, basophilia and eosinophilia as representatives of cytological structure</li> <li>5. Microtomes and their application and usage (history since Purkinjea, manual, rotary, sliding, cryotome)</li> <li>6. Classification of histological staining methods, simple staining</li> <li>7. Complex staining</li> <li>8. Selective staining, major cytochemical reactions</li> <li>9. Methods of bacterial staining, simple and complex</li> <li>10. Preparation of microscopic specimens: helminths and arthropods</li> <li>11. Tissue cultures</li> <li>12. Biology and working conditions with laboratory animals</li> <li>13. Pathology of laboratory animals and prevention of anthroozoonoses</li> <li>14. Consultation hours for preparation of exam</li> </ol> <i>Practical education</i> <ol style="list-style-type: none"> <li>1. Native and vital microscopic preparations</li> <li>2. Measuring procedure using a scale; pipetting and solution preparation, first aid in poisoning</li> <li>3. Preparation of fixative, obtaining tissue sections, rinsing after fixation, dehydration</li> <li>4. Staining blood smear by the method of Giemsa</li> <li>5. Paraffin embedding, cutting the sections using microtome</li> <li>6. Hematoxylin-eosin staining</li> <li>7. Masson trichrome and PAS staining</li> <li>8. Principles of immunohistochemistry</li> <li>9. Explantation, primary and continuous culture</li> <li>10. Experimental animal disease models</li> <li>11. Methods of post-mortem diagnostics in laboratory animals</li> <li>12. Writing an essay;</li> <li>13. Pre-exam practical work</li> </ol>

**Literature***Compulsory*

1. Bancroft J.D, Stevens A. Theory and practice of histological techniques. Churchill Livingstone, Edinburgh, 2005.

**Number of active classes****Theoretical classes: 30****Practical classes: 15****Teaching methods:** Lecture and Practice**Student activity assessment (maximally 100 points)****Pre-exam activities****points****Final exam****points**

Lectures

20

Written

40

Practices

10

Oral

Colloquium

15

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Essay

15