Study program: Integrated academic studies in dentistry

Type and level of the study program: integrated academic studies

Course title: Microscopic laboratory techniques in medicine (DII-MLAB)

Teacher: Dušan M. Lalošević, Ivan Đ. Čapo

Course status: elective

ECTS Credits: 3

Condition: -

Course aim: Students will get acquainted with techniques of making histological preparations for microscopic examination

Expected outcome of the course:

Knowledge: 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

Skills: 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

Course description

Theoretical education

1. Microscopes, history, types
2. Classification of toxins according to WHO and prevention of poisoning and other accidents in the histology laboratory
3. Methods of tissue fixation, selection of fixative for light and electron microscopy
4. Blood and tissue smears and impressions, cytological features of particular samples, basophilia and eosinophilia as representatives of cytological structure
5. Microtomes and their application and usage (history since Purkinjea, manual, rotary, sliding, cryotome)
6. Classification of histological staining methods, simple staining
7. Complex staining
8. Selective staining, major cytochemical reactions
9. Methods of bacterial staining, simple and complex
10. Preparation of microscopic specimens: helminths and arthropods
11. Tissue cultures
12. Biology and working conditions with laboratory animals
13. Pathology of laboratory animals and prevention of anthropozoonoses
14. Consultation hours for preparation of exam

Practical education: exercises, other forms of education, research related activities

1. Native and vital microscopic preparations
2. Measuring procedure using a scale; pipetting and solution preparation, first aid in poisoning
3. Preparation of fixative, obtaining tissue sections, rinsing after fixation, dehydr.ation
4. Staining blood smear by the method of Giemsa
5. Paraffin embedding, cutting the sections using microtome
6. Hematoxylin-eosing staining
7. Masson trichrome and PAS staining
8. Principles of immunohistochemistry
9. Explantation, primary and continuous culture
10. Experimental animal disease models
11. Methods of post-mortem diagnostics in laboratory animals
12. Writing an essay;
13. Pre-exam practical work

Literature

Compulsory

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

Additional

1. -

Number of active classes				Other:
Lectures: 30	Practice: 15	Other types of teaching:	Research related activities:	

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	.....	
Essay	15		