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Course Specification of histology for Master of Hepatobiliary surgery

A- Administrative Information
Course Title: Histology for master of surgery
Code: SURG H 712
Department giving the course: histology department
Program(s) on which the course is given: Master of Hepatobiliary surgery
Department(s) offering the Program: Hepatobiliary Surgery department
Academic year/level: 1st part
Date of approval by Departmental and NLI Council: 2011

B- Professional Information
1 – Overall aims of course:
To provide students with knowledge concerning the basic histological structure and ultrastructure of the eukaryotic cell with correlation to biological cellular activities, and basis of cytogenetics and to teach the student the normal histological structure of different tissues of human body in addition to its systems with functional and clinical correlation whenever possible. And to enable students to know the histological structure of various organs and systems of the body.

a- Knowledge and understanding :
By the end of the course, student should be able to:
a1-Define and describe the structure and functions of the cytoplasmic components.
a2-Explain the process of cell division and identify the activities that control the transition from each phase of the cell cycle to the other.
a3-Know the structural characteristics of the four basic tissue types.
a4-Describe the functional capabilities of each tissue type and relate them to the structure.
a5-Describe and compare between different blood elements and their development.
a6-Define and discuss the basic histological structure of some systems (vascular, lymphatic & nervous).
a7-Describe the normal histological structure of various body systems (digestive, endocrine, urinary, male & female reproductive).
a8-Distinguish structural features of organs, regions and cell types present in" each system and relate the structural variations to differences in organ function.
a9-Correlate between the blood supply of some organs and their structure and specialized functions.

b-intellectual skills :By the end of this course, students should be able to
B1-Evaluate the structural features and different tissue elements of each organ.
B2-Draw and label the structures of different organs.
b3 Recognize and differentiate between types of cells and tissues in histological slides.

c-professional and practical skills: By the end of the course, student should be able to
c1 Select appropriate methods to reveal specific microscopic features of cells and tissues.
c2 construct structures that could be present in a cell from its function.
c3 Relate the composition of each tissue type to its specific functions.
c4 Predict the intracellular or tissue components likely to be involved in a functional deficit.

d-general and transferable skills: By the end of thin course, students should be able to
d1 Appreciate the importance of lifelong learning.
d2 Use the sources of biomedical information available to remain current with advances in knowledge and practice.
d3 Communicate actively with his colleagues as well as the employees and staff members.

3- COURSE CONTENT
Detailed topics of the course:

2- Cytology
- Cell membrane (plasma membrane) and glycocalyx (LM & EM, Molecular structure, Functions, Endocytosis and Exocytosis; Receptors and signaling reception).
- Mitochondria (LM & EM, Membrane enzymes, Elementary particles, Mitochondrial DNA & RNA, Functions)
- Ribosomes (LM & EM, Free and attached, Polysomes, chemical composition, Functions)
- Endoplasmic reticulum (Rough & Smooth, LM & EM, Functions)
- Golgi apparatus (LM & EM, Functions)
- Lysosomes (LM, histochemical reactions & EM, Origin, Types and Fate, Functions)
- Centrioles, Cilia and Flagella
- Cytoplasmic inclusions (Stored food, pigments)
- Nucleus of interphase (Nuclear envelope, Chromatin, Nucleolus, Nuclear sap)
- The cell cycle (Interphase G1, S & G2 and mitosis)
- Cell division, Mitosis (Events, Mitotic chromosomes, Mitotic spindle, Phases) & meiosis
- Nucleic acids, DNA & RNA (Chemical composition, Structural differences, nucleotides & genes, codons & anticodons, protein synthesis, transcription, translation, replication & Types of RNA)
- Cell death (necrosis versus apoptosis)

2- Epithelium:
- General characteristics of epithelium & its types
- Types of simple epithelium (structure & sites)
- Transitional epithelium
- Structure & sites of stratified squamous & stratified columnar epithelium
- Glandular epithelium with reference to sites
- Neuro- and myo-epithelium with reference to sites
- General functions of epithelium
- Modifications of epithelial cells surfaces: Apical, basal & lateral modifications
- Basement membrane

3- Connective Tissue:
- General characteristics
- Cells of C.T. proper (LM, EM & functions)
- Fibers of C.T.
- Ground substance

Cartilage:
- Types of cartilage
- Histology of each type
- Sites of each type
- General functions

Bone:
- Types of bone with reference to sites
- Bone cells & their functions
- Histology of compact bone
- Histology of spongy bone
Differences between cartilage & bone
Ossification (intramembranous & intracartilagenous)

Blood & Hemopoiesis:
Components of Blood
Normal structure, size & number of erythrocytes, ultrastructure & functions
Abnormalities in structure, size & number of RBCs
Polycythaemia & anaemia and their causes
Types of WBCs & normal percentage of each
Total RBCs count
Total leucocytic count & its clinical importance
Differential leucocytic count & its importance
Types & structure of bone marrow
Erythropoiesis
Granulopoiesis
Development of lymphocytes
Development of monocytes
Development of platelets

4 - Muscle Tissue:
General histological characteristics and types of muscle tissue
Types of skeletal muscle fibers
Smooth muscle fibers (LM & EM)
Cardiac muscle fibers (LM & EM)
Conducting system of heart

5 - Nerve Tissue:
Types (classification) of neurons & examples
Histology of peripheral nerve fibers
Structure of nerve trunk
Spinal & autonomic ganglia
Synapse
Degeneration & Regeneration of nerve fibers
Neuroglia (Definition, Classification & Sites)

6 - Vascular System:
General structure of blood vessels & its significance
Large, medium sized & small arteries
Small, medium sized & large veins
Types, sites & structure of Arteriovenous connections

7 - Lymphatic (Immune) System:
Cells involved in the immune system & their functions
Antigen presenting cells
Primary & secondary immune response
Cellular & Humoral immunity
Lymph vessels & distribution of lymphoid tissue
Structure of Lymph node & its immunological function
Structure of Spleen & its function
Differences between lymph node & spleen
Blood supply of spleen & theories of circulation
Structure of Tonsils
Structure & functions of thymus
Thymic barrier

8 - DIGESTIVE SYSTEM

ORAL CAVITY
Lip
Tongue & taste buds
Teeth & gingiva
Palate and Pharynx

**ALIMENTARY TRACT**
- Oesophagus
- Stomach & gastro-oesophageal junction
- Small intestine & pyloro-duodenal junction
- Large intestine, appendix & Anal canal

**DIGESTIVE GLANDS**
- Salivary glands
- Pancreas
- Liver & gall bladder

**9- URINARY SYSTEM**
- Kidney & blood supply of urineferous tubule
- Blood renal barrier
- Juxta-glomerular complex
- Ureter, Urinary bladder & Urethra

**10 - ENDOCRINE SYSTEM**
- Distribution of endocrine glands
- Pituitary gland
- Suprarenal gland
- Thyroid gland
- Parathyroid gland
- Pineal body
- General characteristics of diffuse neuro-endocrine cells, distribution & function

**11 - MALE GENITAL SYSTEM**
- Testis & blood-testis barrier
- Vasa efferentia. Epididymis, Vas deferens & spermatic cord
- Seminal vesicles, prostate & penis

**12- FEMALE GENITAL SYSTEM**
- Ovary
- Fallopian tube
- Uterus & menstrual cycle
- Placenta
- Vagina & mammary gland

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(Immune) System:  
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4- Teaching and learning methods  
4.1 Lectures: for acquisition of knowledge  
5- Student assessment methods  
5.1 final written and oral exams  
Assessment schedule  
One and half hours written paper +oral exam  
**Weighting of assessments**  
Final-term written examination 50%  
Oral examination 25%  
Total 100%  
6- List of list of references:  
6.1 Course note:  
Department elementary books  
6.2- Essential Books (Text Books)  
6.3- Recommended Books  
6.4- Web Sites:  
www.yahoo.com  
www.pubmed.com  

7- Other Resources / Facilities required for teaching and learning to achieve the above ILOs  
1-NLI Lecture halls  
2-NLI library can be used for projects and textbooks  
3-Audiovisual aids as: writing boards and overhead projectors.  
**Course coordinator:**
Name: Prof. Dr. Gamal ElBadawy Hagras
Signature
Head of the department of Histology: