



HHA 303: MICROSCOPIC ANATOMY AND MOLECULAR BIOLOGY

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Staff

1. Dr. Wycliffe Kaisha
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COURSE DESCRIPTION

This involves the study of anatomy with aid of a microscope. It is broadly classified into cytology and histology which involve the study of cell; their structure, organelles and inclusions and tissue i.e. the organization respectively. The Department of Human Anatomy, UoN offers histology as its main course of microscopic anatomy. This study involves;

□ A study of harvesting of specimen, preparation techniques and staining methods
□ A study of the broad classification of tissue types in the human body and the subtypes i.e. connective tissue, epithelial tissue

□ A study of the intricacies of each tissue, the distinct features, types of cells and the organization or modifications, the functions of each tissue and how to identify each tissue

□ Knowing the normal anatomy and relating it to pathology and further practice

The above objectives are mainly approached from a systemic gross anatomy point of view.

Histology lectures and lab sessions are held once each week but students can access the facilities' on any workday within working hours. This is to encourage scholarly endeavours. Lectures on what to expect are held before each session. During each session a student has a hands on experience of use of a microscope and various specimen already prepared into microscopic slides.

COURSE CONTENT

Cell structure: Structural and functional organization of the cell membranes and subcellular organelles, cytoskeleton and nucleus.

Cell activities: Synthesis, secretion, exocytosis, endocytosis. Cell motility and dynamism. Intracellular, transcellular and intercellular transport. Organelle production and renewal. Regulation of cell function. Ultrastructural features of cells of protein, steroid synthesizing, ion transport, phagocytosis. 2

Cell cycle: Phases and regulation. Apoptosis, necrosis.

Histology: Microscopic features, structural and functional organization of the nervous, epithelial, muscular and skeletal tissues. Adaptations to function.

Organology: Microscopic features and organization of all organs of the human body. Cells, tissue types and respective functions. Adaptations to function. Regional features within systems.

Molecular biology: Definition, scope and significance. Structure, types properties, replication, retrieval of DNA and RNA in vivo. DNA polymerases, and replication primers. Molecular



markers - Alloenzymes; RFLPs, molecular alleles. Random amplified polymorphic DNA (RAPD), microsatellites (STRs). DNA technology. cDNA and genomic libraries and screening. Polymerase Chain Reaction and sequencing. Transgenic organisms. Introduction to proteomics. Bioinformatics, internet tools as a resource, sequence databases and online tools. Link to genome projects, software environment for DNA sequence analysis. Sequence alignment. Phylogenetic inference. Sequence data bases. Nuclear probes.

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