

Pathology Lab Techniques and Basic Histology Course Agenda

Asynchronous Course Outline:

Module 1: Laboratory Techniques in Histology

➤ **Topic: 1.1 Patient-derived Materials for Histology**

- 1.1a Preparation of Histological Specimens
 - 1.1a.1: Overview and Applications of Histological Specimens
 - 1.1a.2: Preparation of FFPE Samples (I)
 - 1.1a.3: Preparation of FFPE Samples (II)
 - 1.1a.4: Preparation of Frozen Section
 - 1.1a.5: Advantages and Limitations
- 1.1b Blood
 - 1.1b.1: Definition and Applications of “Liquid Biopsy”
 - 1.1b.2: Components of Blood
 - 1.1b.3: Processing of Blood
 - 1.1b.4: Examples of Research Studies using Blood
- 1.1c Cytology Samples
 - 1.1c.1: What is Cytology and Types of Cytology Samples
 - 1.1c.2: Types of Cytology Preparations
 - 1.1c.3: Examples of Research Studies using Cytology Samples

➤ **Topic: 1.2 Techniques using Patient-derived Materials**

- 1.2a Histological Techniques
 - 1.2a.1: Tissue Staining
 - 1.2a.2: Immunohistochemistry (I)
 - 1.2a.3: Immunohistochemistry (II)
 - 1.2a.4: Immunohistochemistry (III)
- 1.2b *In Situ* Hybridisation
 - 1.2b.1: What is *In Situ* Hybridisation
 - 1.2b.2: Workflow for *In Situ* Hybridisation I
 - 1.2b.3: Workflow for *In Situ* Hybridisation II
 - 1.2b.4: Examples of Research Studies using *In Situ* Hybridisation
- 1.2c Next Generation Sequencing
 - 1.2c.1 Patient Sample Processing: DNA and RNA Extraction
 - 1.2c.2 NGS Sequencing of Patient Sample
 - 1.2c.3 Data Analysis and In Silico Data Mining

- 1.2d Spatial Transcriptomics
 - 1.2d.1 What is Spatial Transcriptomics
 - 1.2d.2 Why use Spatial Transcriptomics
 - 1.2d.3 Assays for Spatial Transcriptomics
 - 1.2d.4 Workflow for Spatial Transcriptomics
 - 1.2d.5 Examples of Research Studies using Spatial Transcriptomics

➤ **Topic: 1.3 Regulatory Requirements for Use of Tissue Samples**

- 1.3.1 Regulatory Requirements for Use of Tissue Samples Part I
- 1.3.2 Regulatory Requirements for Use of Tissue Samples Part II

Module 2: Histology and Neoplasia

➤ **Topic: 2.1 Normal Histology**

- 2.1a: Basic Concepts in Normal Histology
 - 2.1a.1: What is Histology? and Overview of Tissue Types
 - 2.1a.2: Epithelium I. Surface Epithelium
 - 2.1a.3: Epithelium II. Glandular epithelium
 - 2.1a.4: Epithelium III. Basement membrane
 - 2.1a.5: Connective Tissue
 - 2.1a.6: Summary of Normal Histology
- 2.1b. Inflammatory cells
 - 2.1b: Normal Histology – Special focus on Inflammatory Cells
 - 2.1b.1: Types of Immune Cells
 - 2.1b.2: Patterns of Inflammation
 - 2.1b.3: Inflammation and Cancer
 - 2.1b.4: Summary
- 2.1c: Normal Histology Slide Review
 - 2.1c: Slide Review – Normal Histology
 - 2.1c.1: Stratified Squamous Epithelium: Skin, Uterine cervix
 - 2.1c.2: Glandular Epithelium I: Airways and Lung
 - 2.1c.3: Glandular Epithelium II: Breast
 - 2.1c.4: Glandular Epithelium III: Colon (Large Intestine) and Stomach

➤ **Topic: 2.2 Neoplasia**

- 2.2a: Basic Concepts in Neoplasia
 - 2.2a.1: Definitions and Classification
 - 2.2a.2: Nomenclature
 - 2.2a.3: Premalignant vs Malignant lesions
 - 2.2a.4: Prognostic factors – Grading and Staging
- 2.2b: Neoplasia Slide Review
 - 2.2b.1: Squamous lesions I:
 - Conjunctiva – Squamous papilloma
 - Uterine cervix – Squamous cell carcinoma-in-situ
 - 2.2b.2: Squamous lesions II:
 - Skin – Squamous cell carcinoma
 - Oesophagus – Squamous cell carcinoma with vascular invasion
 - Lung - Squamous cell carcinoma
 - 2.2b.3: Glandular lesions I:
 - Colon – Tubular adenoma with low grade dysplasia
 - Colon – Adenocarcinoma arising in a tubular adenoma
 - Colon – Adenocarcinoma
 - 2.2b.4: Glandular lesions II:
 - Breast – Ductal carcinoma-in-situ, invasive carcinoma
 - Lung - Adenocarcinoma
 - 2.2b.5: Glandular lesions III:
 - Stomach – Adenocarcinoma, intestinal type, with nodal metastases
 - Stomach – Adenocarcinoma, signet ring cell (Lauren diffuse type)
 - 2.2b.6: Metastatic malignancy:
 - Liver – Metastatic colonic adenocarcinoma

Synchronous Course Description:

Module 1S Synchronous In-Person (Lab Hands-on): 2 days

The Hands-On Lab Practical Course provides participants with a comprehensive learning experience in the fundamental techniques of immunohistochemistry (IHC). Over the duration of the course, participants will gain practical knowledge of the key steps involved in IHC, including the sectioning and processing of formalin-fixed paraffin-embedded (FFPE) slides, antigen retrieval, antibody preparation, staining of slides, and post-staining processing.

Module 2S Histology Session (online): 3 hours

Small group interaction session with an instructor, with real-time exercises in recognising normal and cancerous tissues on histology.