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Introduction to Anatomic Pathology Mini-Elective

Spring 2019

<u>Course Dates:</u>	April 2, 9, 16, 23, 30 Sessions 1, 2, 4 & 5: 2 to 4 PM; Session 3: 2 to 5 PM
<u>Maximum Students:</u>	6
<u>Class Year:</u>	MS1
<u>Course Director:</u>	Aatur D. Singhi, MD, PhD
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Description:

Anatomic pathology can be described as the use of tissue examination under a microscope to make diagnoses. It is what most pathologists do most of each workday. This mini-elective will show the students how diagnoses are rendered. It should provide an appreciation of the challenges of the specialty and highlight the rewards of a potential career in pathology. Students will emerge from the elective rotation with a basic knowledge of 6-8 diseases, many organ-specific, not covered in the first-year curriculum. Likely diseases include leukemia, gastroesophageal reflux disease, Helicobacter pylori gastritis, pancreatic cancer, gastrointestinal stromal tumors, mucoepidermoid carcinoma of the salivary glands, and oral squamous cell carcinoma. Further, special emphasis will be made to incorporate molecular testing and personalized medicine. Some sessions will include radiographs and the gross pathology before the slides to assist in developing a broader perspective on specific diseases. Transportation will be provided to and from the remote sites of the rotation.

During the course sessions, students will be actively engaged in making observations and interpreting information. Each student will cut and stain at least one frozen section during the first session and perform a fine needle aspiration of a tissue specimen during the third session. Comparable to the way in which residents and clinical year students learn through discussing cases, students, faculty and the course director will discuss cases in real time. Though the process of questioning, students will be encouraged to apply what they know and push ahead to develop deeper insights about the diseases and hone their critical thinking skills.

Course Objectives:

- To prepare medical students to be astute users of biopsy results and interpret molecular testing.
- To help medical students learn the process of obtaining a diagnosis from a biopsy or cytology specimen.
- To give students an appreciation that every anatomic pathology diagnosis comes with a degree of uncertainty and fallibility, and with a differential diagnosis.
- To provide students with a basic knowledge of key features of at least 8 common and important diseases.

Requirements:

- Active participation in the five course sessions.
- A general foundation in pathology and precision medicine as how it relates to medical disease.

COURSE OUTLINE: INTRODUCTION TO ANATOMIC PATHOLOGY

Locations:

UPMC Presbyterian Department of Pathology
UPMC Shadyside Department of Pathology
UPMC Clinical Laboratory Building
UPMC St. Margaret's Department of Pathology

Session 1: April 2, 2019, 2:00-4:00 PM

Introduction to Elective, Frozen Section Cutting and Pancreaticobiliary Pathology and Head and Neck Pathology

Instructors: Aatur Singhi, MD PhD and Raja Seethala, MD

Location: UPMC Presbyterian Department of Pathology

Objectives:

Students will gain an understanding of

1. How frozen section specimens are processed, and diagnoses made
2. The important role of frozen section diagnosis of margins of resection
3. The challenges of diagnosing pancreatic cancer
4. The utility of precision medicine in the early diagnosis of pancreatic cancer

Class format:

An introduction to the pathology elective will be given with a tour of grossing facilities at UPMC Presbyterian Hospital. This session will also include cutting and staining a frozen section of a tissue specimen and interpreting it at a multi-headed microscope; each student will do at least one with Drs. Seethala and Singhi. In addition, Dr. Seethala will review various head and neck pathologic entities that students may encounter within their clinical rotations. Surgical ramifications will also be discussed. The students will look at microscope slides/powerpoint images of pancreaticobiliary pathology with Dr. Singhi representing different types of tumors and inflammatory lesions. Dr. Singhi will also discuss precision medicine efforts in the early diagnosis of pancreatic cancer that has been adopted by the University of Pittsburgh Medical Center.

Session 2: April 9, 2019, 2:00-4:00 PM

Gastrointestinal Pathology and Hematopathology

Instructors: Jon Davison, MD and Miroslav Djokic, MD

Location: UPMC Presbyterian Department of Pathology

Objectives:

Students will gain an understanding of

1. The common diseases involving the gastrointestinal tract including gastroesophageal reflux, Barrett's esophagus, colon cancer and other entities
2. The emerging ancillary studies performed in gastrointestinal pathology that may affect patient management
3. The appearance of cells in a normal blood smear and smear with leukemia
4. The appearance of normal bone marrow and of bone marrow with leukemia

Class format:

The session will include a thorough review of common diagnostic entities encountered in clinical practice involving the gastrointestinal tract with Dr. Davison. If a suitably educational surgical specimen comes to the laboratory, the students will also be able to see review representative gross specimens. Dr. Davison will also briefly review commonly ordered ancillary studies used to evaluate gastrointestinal disease including cancers. Students will finish the afternoon by reviewing peripheral blood smears and bone marrow biopsies of a leukemia with Dr. Djokic and will compare these findings to corresponding normal specimens. Students will gain knowledge of how to interpret a blood smear and bone marrow biopsy and with a new rudimentary understanding of at least three additional diseases.

Session 3: April 16, 2019, 2:00-5:00 PM

Fine Needle Cytology, Sarcoma Diagnostics and Genitourinary Pathology

Instructors: Sara Monaco, MD, Anette Duensing, MD, Gabriela Quiroga-Garza, MD

Location: UPMC Shadyside Department of Pathology

Objectives:

Students will gain an understanding of

1. The ability to make a diagnosis on fine needle aspiration cytology
2. The difficulty of a correct sarcoma diagnosis, yet its importance for successful therapy
3. The challenge of making a diagnosis of prostate cancer on needle biopsy

Class format:

Students will each perform a fine needle aspiration of a tissue specimen, stain it and look at it at a multi-headed microscope with Dr. Monaco. They will see cytology slides of fine needle aspirations of patients with interesting diseases. In addition, students will learn about several (molecular) diagnostic methods and gain basic knowledge of sarcoma pathology with Dr. Duensing. They will learn why a correct diagnosis is important for successful therapy and will be introduced to the concept of targeted therapies. Students will conclude with Dr. Quiroga-Garza, who will review genitourinary biopsies and the significance of these diagnoses and how they relate to patient treatment and outcome.

Session 4: April 23, 2019, 2:00-4:00 PM

Introduction to Clinical Molecular Genetic Testing

Instructor: Somak Roy, MD

Location: UPMC Clinical Laboratories Building (8th Floor)

Objectives:

Students will gain an understanding of

1. To learn the principles of personalized molecular medicine
2. To become familiar with molecular testing available to patients with neoplastic diseases
3. To understand the physician's role in ordering of molecular tests

Class format:

This session will be conducted in the clinical Molecular and Genomic Pathology (MGP) laboratory, Department of Pathology. The MGP laboratory is one of the largest laboratories in the US focused on molecular diagnostics of solid tumors. It processes over 17,000 samples each year using high-throughput technologies, such as next-generation sequencing (NGS). Students will be given a tour of the MGP laboratory and the laboratory director, Dr. Roy will discuss several aspects of the MGP laboratory and how it integrates testing with clinical assessment, diagnosis, prognosis and treatment of patients at the University of Pittsburgh Medical Center.

Session 5: April 30, 2019, 1:00-5:00 PM**

Community Hospital Pathology

Instructor: Jagjit Singh, MD

Location: UPMC St. Margaret's Department of Pathology

Objectives:

Students will gain an understanding of

1. The variety of tissue types submitted for diagnosis in community hospital pathology
2. The workflow of a busy laboratory and time pressure under which pathologists make diagnoses.

Class format:

The students will be engaged in observing specimen processing and examining microscope slides projected from a double-headed microscope with the staff pathologists, including slides of biopsies, cytology specimens and surgical resections. Since the community hospital has a full range of specimens, diseases they have not seen in the previous three sessions will be selected for presentation. Students will finish the afternoon with a new rudimentary understanding of at least two additional diseases.

References:

The recommended textbook to bring to each session is Robbins Pathologic Basis of Disease.

Other recommended non-medical reading:

Blink: The Power of Thinking Without Thinking, Malcolm Gladwell

The Final Diagnosis, Arthur Hailey

Course Evaluation:

Each student will be asked to complete an evaluation of the course at its conclusion.

****WARNING: Transportation to and from the remote sites is required and the need to prepare students before each session means that the students who take this elective have to come to pathology at 1 PM and get back as late as 5 PM, so the time commitment is from 1 PM to 5 PM rather than 2 PM to 4 PM. See attached directions to St. Margaret.**