NEWLY CREATED ELECTIVE FOR UPSOM COURSE CATALOG

Medical School Elective (MSELCT)

Name: CLINICORADIOPATHOLOGIC APPROACH TO INTERSTITIAL LUNG DISEASE

Campus/location: UPMC Presbyterian/Montefiore/Falk Clinic

| Slots Available (per | r period) Two (2) |
|----------------------------|---|
| Visiting Students A | ccepted Yes |
| International Stude | ents Accepted Yes |
| Prerequisite | Completed Med Student Year 2 including introduction to history taking and |
| | physical examination; basic radiology knowledge including chest radiology |
| | and anatomy (for example, Advanced Radiology course) |
| Course Director | Frank Schneider, MD |
| Teaching Faculty | Pathology: Samuel Yousem, MD, Bruce Rabin MD PhD, |
| | Frank Schneider, MD |
| | Pulmonology: Kevin Gibson, MD, Kristen Veraldi, MD PhD, |
| | Daniel Kass, MD, Naftali Kaminski, MD PhD, |
| | Carol Feghali-Bostwick, PhD |
| | Rheumatology: Thomas Medsger, MD, Rohit Aggarwal, MD |
| | Radiology: Carl Fuhrman, MD, Joan Lacomis, MD, Diane Strollo, MD |
| | Nursing: Kathleen Lindell, PhD RN |
| Where to Report | Dr. Schneider's office, Presbyterian Hospital, C Wing Room 605 |
| Contact Name | Frank Schneider, MD |
| Contact Phone | (412) 647 6203 |
| Contact EMail | schneiderf@upmc.edu |
| Department Studer | at Coordinator |
| Special Permission | Required No |
| Electronic Add/Dro | p Permitted Yes |
| Number of Weeks | Required To Add or Drop Four (4) |
| Bocks course will b | e offered Two (2) blocks per year |
| | |

Course Created (date) May 2012

Notes:

Rationale and Need:

This elective is designed to give students a stronger foundation in interstitial lung disease for internship and residency training. It it emphasizes three core concepts: (1) the *sine qua non* of an interdisciplinary approach to lung disease (during this elective involving physicians from at least four different specialties), (2) the indications, benefits and limitations of laboratory testing including blood tests and histologic examination in the setting of lung disease, and (3) the

importance of confirming or excluding interstitial lung disease as the cause of shortness of breath, since some interstitial lung diseases are readily curable with intervention while others are potentially devastating.

The lungs possess two noteworthy properties. First, their large surface area forms one of the largest interfaces between the human organism and the environment. However, this interface is the one most difficult to protect from, and often even voluntarily exposed to, noxious stimuli. Secondly, the lungs are the only organs that encounter the entire cardiac output of blood, and are theoretically exposed to hematogenous factors derived from all other tissues in the body. It is therefore not surprising that the lungs are often involved in systemic diseases.

Despite its anatomic complexity, histologically the lung only exhibits a rather limited repertoire of reaction patterns to injury. The three most important ones are airspace organization, inflammatory infiltrates and fibrosis. Each one has characteristic radiographic and physical examination correlates. Although most clinical entities of lung disease have well described histopathologic findings, many of these entities show significant histopathologic overlap. It is therefore of high importance to integrate the findings and impressions of primary caregivers, radiologists and pathologists in order to arrive at the correct diagnosis and formulate the most appropriate treatment plan.

This constitutes the rationale and strength of this elective. While many medical school rotations emphasize and encourage interdisciplinarity, the primary responsibilities of the student usually lies within a single specialty. This elective, although initiated by pathologists, is meant to be a true multidisciplinary and in-depth experience. Students will be held accountable by faculty from all participating specialties. The focus shall be the need for diagnosis and treatment of a patient with lung disease utilizing pathology, radiology and medicine as tools, rather than teaching pathology, radiology or medicine utilizing patients as ways and means.

Learning Objectives:

At the end of this elective, medical students will have been exposed to a variety of interstitial lung diseases and be able to do the following:

- Recognize normal lung anatomy (UPSOM Learning Objective 1)
- Distinguish interstitial and fibrosing lung disease histologically from airspace disease and normal lung (UPSOM Learning Objectives 1, 2, 3)
- Describe the main histologic features of usual interstitial pneumonia (UPSOM Learning Objectives 2, 3)
- Discuss possible etiologies for the histologic diagnosis of usual interstitial pneumonia (UPSOM Learning Objective 3)
- Discuss possible etiologies for the histologic diagnosis of non-specific interstitial pneumonia (UPSOM Learning Objectives 2, 3)
- Discuss the importance of granulomas in lung biopsies (UPSOM Learning Objectives 2, 3)
- Develop an awareness of limitations of histologic examination and communication of its results (UPSOM Learning Objective 26)

- Demonstrate professional interactions with physicians, staff and patients (UPSOM Learning Objectives 6, 11, 12, 13, 24, 31)
- Generate a differential diagnosis for patients with cough (UPSOM Learning Objectives 17, 18, 20)
- Generate a differential diagnosis for patients with shortness of breath (UPSOM Learning Objectives 17, 18, 20)
- Perform relevant literature searches for topics of interest (UPSOM Learning Objectives 5, 27)
- Generate a set of pertinent questions to ask a patient with shortness of breath and/or suspected to have interstitial lung disease (UPSOM Learning Objective 7)
- Recognize findings in the medical history of patients with interstitial lung disease that offer an etiologic explanation for their lung disease (UPSOM Learning Objectives 7, 17)
- Interpret pulmonary function tests (UPSOM Learning Objective 19)
- Be familiar with generic drug names used in the treatment of interstitial lung disease (UPSOM Learning Objective 21)
- Know the most common unwanted effects of drugs commonly used for interstitial lung disease (UPSOM Learning Objective 21)
- List connective tissue diseases that can involve the lung (UPSOM Learning Objective 3)
- Generate a panel of serologic studies that could be used to identify a connective tissue disease in a patient with interstitial lung disease (UPSOM Learning Objective 19)
- Suggest an appropriate clinical workup for patients with rheumatologic diseases who are suspected to have lung involvement by their connective tissue disease (UPSOM Learning Objective 19)
- Demonstrate a systematic approach to interpretation of chest X-rays and chest CTs (UPSOM Learning Objective 19)
- Distinguish reticular, nodular, ground glass and tree-in-bud patterns on high resolution chest CTs (UPSOM Learning Objective 19)
- Recognize honeycomb change, traction bronchiectasis and air-trapping in chest CTs (UPSOM Learning Objective 19)
- Recognize the value of a multi-disciplinary case discussion in the setting of interstitial lung disease (UPSOM Learning Objectives 12, 13)
- Describe molecular alterations related to the development of interstitial lung disease (UPSOM Learning Objectives 5, 33)
- Describe research laboratory techniques used to identify molecular players in interstitial lung disease (UPSOM Learning Objective 33)
- Provide useful feedback at the end of the elective (UPSOM Learning Objectives 32, 34)

Description:

Logistics:

The course director will meet with students at the beginning of the rotation to review learning objectives and discuss the students' individual interests and learning goals. An updated schedule of activities will be provided on the first day of the rotation. All educational activities are located at UPMC Presbyterian Campus including Montefiore Hospital and Falk Clinic. Although the proposed schedule above shows almost uninterrupted daytime student contact hours, daily

schedules should be flexible enough to allow for breaks and self-guided educational time. The typical day will start at 8 am and end at 5 pm. There are no night or weekend requirements.

Educational Methods:

Students will interact directly with faculty. In pathology, instruction will consist of one-on-one teaching in the pathology gross room and at the microscope. In the clinics, student will be involved in all aspects of care, from history taking and physical examination to planning of diagnostic workup and treatment. In radiology, imaging studies will be reviewed independently and discussed with faculty. In the laboratories, there will be one-on-one discussion with faculty and other members of the laboratory about research strategies and techniques. Students will be required to keep a patient log and expected to look up relevant literature. Key references will be provided.

Times And Venue:

Students will start their rotation with a refresher in lung anatomy and normal histology along with a discussion of alveolar and interstitial lung injury, organization and fibrosis/scarring. The pathologists will then during the first week introduce all idiopathic interstitial pneumonias as classified by the current joint consensus statement of the American Thoracic Society and the European Respiratory Society. Students will be exposed to whole lung specimens obtained from patients undergoing lung transplantation. In the gross room as well as at the microscope, emphasis will be placed on why certain histologic findings give rise to certain radiographic features. If a chest CT is available, it will be reviewed together with the microscopic slides. Histologic examination of tissues will employ glass slides as well as professional digital whole slide imaging and teaching sets. Histology will be reviewed with faculty and independently by students. The pulmonologist's clinical impression will be obtained either from clinical notes or personal conversation so that from day one all available data will be combined to make the best histopathologic diagnosis. Dr. Bruce Rabin will give a basic review of immunology and autoimmunity serologic tests.

During the second and third week, students will be spending most time during the day with pulmonary medicine and rheumatology faculty. Here, students will see patients and assess them for interstitial lung disease. During initial patient visits, they will learn to elicit relevant information during history taking and physical exams in order to plan the appropriate diagnostic workup. During follow-up visits, they will learn about specific lung diseases, their natural history and prognosis as well as treatment options. Assessing response to or success of therapeutic intervention will be a focus in these patients. Concomitantly, students will spend time with dedicated expert thoracic/chest radiologists and review current patients. Students are encouraged to review the imaging of patients whom they encountered in the clinic with the radiologist. If biopsy material is available, they are encouraged to review the histopathologic findings with one of the pathology faculty.

During the fourth week, focus will shift from active patient care to the present frontier of scientific discovery in interstitial lung disease. Students will spend time with course faculty in their basic and translational research laboratories. Students use their newly acquired knowledge to drill down into the pathogenetic mechanisms that, if successfully controlled or manipulated, may at some point offer new therapeutic approaches to interstitial lung disease. Rather than observe scientist carry out experiments, this week is intended to stimulate discussion between students and

scientists, most of whom also clinically active, in order to help trace and integrate the steps of a patient with interstitial lung disease from taking their history, reviewing their chest CT, obtaining a biopsy, identifying pathogenetic mechanisms that lead to medical treatment, or result in lung transplantation.

During the entire elective, students will attend a series of conferences. The most central meeting occurs once a week and constitutes a working conference attended by pulmonologists, rheumatologists and pathologists. This conference discusses current patients with diagnostic or therapeutic challenges. Other conferences are mostly didactic or consensus conferences.

A proposed approximate schedule for this 4-week elective is shown below. It reflects the student contact hours and considers clinic schedules of participating faculty.

Evaluation:

Students will be evaluated according to the learning objectives outlined above. Faculty will evaluate competency in history taking, physical examination, differential diagnosis, management plans and assessment of therapeutic response. Individual feedback will be given throughout the rotation. The course director will meet with the students at the completion of the elective for a review and formal feedback session.

Requirements: Adding or dropping this elective requires four (4) weeks of advance notice

Type of Clinical Experience: Multidisciplinary (Pathology, Pulmonology, Rheumatology, Radiology, Research)

Call Required: No

Student Contact Hours: Per day: 8 Per week: 40

| Week |
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| | Monday | Tuesday | Wednesday | Thursday | Friday |
|--|-------------------------------------|----------------------------------|---|--|----------------------------------|
| 7-8 | | | | | Radiology Teaching Conference |
| 8-9 | Introduction to elective | Thoracic tumor board | Dath alo are of interactivial | Dath alo are of interatitial | Immunology with |
| 9-10 | | Pathology of interstitial | lung disease / acute lung | Pathology of interstitial lung disease / vasculitis teaching session | Bruce Rabin MD PhD |
| 10-11 | Basic lung anatomy and histology | lung disease teaching session | injury teaching session | | Self examination on |
| 11-12 | | Faber Conference | Pulmonary Pathology Consensus Conference | PACCM Meeting | pathology concepts |
| 12-1 | | Slide Consensus Conference | Basic Science Seminar | Pathology Grand Rounds | Pulmonology Grand Rounds |
| 1-2 | Review of slide teaching | | | Teaching Set Self Study | |
| 2-3 | set | | | Boxes 14 and 15 | |
| 3-4 | Gross examination of | Slide review sessions | Pathology signout | Pathology signout | Pathology signout |
| 4-5 | native lungs | | | Pathology Signout | |
| One Monday 1-3 pm: ILD Patient Support Group Meeting | | | | | |

Week 2

| | Monday | Tuesday | Wednesday | Thursday | Friday | |
|--|---------------------|--------------------------------|---|------------------------------------|---|--------|
| 7-8 | | | | | Radiology Teaching Conference | |
| 8-9 | | | | | PACCM Fellows Core Curriculum Conference | |
| 9-10 | Kevin Gibson, MD | Rohit Aggarwal, MD Clinic | Carl Fuhrman, MD Radiology Review | Kristen Veraldi, MD PhD | Rheumatology Fellows Conference | |
| 10-11 | Clinic | | | Clinic | Mid-Elective Review | |
| 11-12 | - | Faber Conference | Pulmonary Pathology Consensus Conference | | Feedback | |
| 12-1 | Research Conference | PACCM Basic Science Seminar | Basic Science Seminar | Pathology Grand Rounds | Pulmonology Grand Rounds | |
| 1-2 | | | Journal Club | | | |
| 2-3 | Daniel Kass, MD PhD | Carl Fuhrman, MD | | Kevin Gibson, MD | Thomas Medsger, MD | |
| 3-4 | Clinic | Clinic Radiology Revie | Radiology Review | Thomas Medsger, MD Clini Clinic | Clinic | Clinic |
| 4-5 | | | | | | |
| One Monday 1-3 pm: ILD Patient Support Group Meeting | | | | | | |

| Week | 3 |
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| | Monday | Tuesday | Wednesday | Thursday | Friday |
|--|---------------------|--------------------------------|---|-------------------------|---|
| 7-8 | | | | | Radiology Teaching Conference |
| 8-9 | | | | | PACCM Fellows Core Curriculum Conference |
| 9-10 | Kevin Gibson, MD | Rohit Aggarwal, MD Clinic | Carl Fuhrman, MD Radiology Review | Kristen Veraldi, MD PhD | Rheumatology Fellows Conference |
| 10-11 | Clinic | | | Clinic | |
| 11-12 | | Faber Conference | Pulmonary Pathology Consensus Conference | | Break |
| 12-1 | Research Conference | PACCM Basic Science Seminar | Basic Science Seminar | Pathology Grand Rounds | Pulmonology Grand Rounds |
| 1-2 | | | Journal Club | | |
| 2-3 | Daniel Kass, MD PhD | Carl Fuhrman, MD | | Kevin Gibson, MD | Thomas Medsger, MD |
| 3-4 | Clinic | Radiology Review | Thomas Medsger, MD Clinic | Clinic | Clinic |
| 4-5 | | | | | |
| One Monday 1-3 pm: ILD Patient Support Group Meeting | | | | | |

| W | eek | 4 |
|---|-----|---|
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| | Monday | Tuesday | Wednesday | Thursday | Friday |
|--|---------------------|--------------------------------|-----------------------|------------------------|---|
| 7-8 | | | | | Radiology Teaching Conference |
| 8-9 | | | | | Final Evolution |
| 9-10 | | | | | Final Evaluation |
| 10-11 | Kaminski Lab | Kaminski Lab | Veraldı Lab | Kass Lab | |
| 11-12 | | | | | |
| 12-1 | Research Conference | PACCM Basic Science Seminar | Basic Science Seminar | Pathology Grand Rounds | |
| 1-2 | – Kaminski Lab | ¥7 · 1·Y 1 | Feghali-Bostwick Lab | Kass Lab | Review of experience, feedback, filling gaps |
| 2-3 | | Kaminski Lab | | | |
| 3-4 | | Lung Transplant | | | |
| 4-5 | | Selection Committee | | | |
| One Monday 1-3 pm: ILD Patient Support Group Meeting | | | | | |