



JOHNS HOPKINS  
SCHOOL *of* MEDICINE

Medical Student  
Elective Book

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## GUIDELINES, RULES AND PROCEDURES FOR ELECTIVES

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### INTRODUCTION AND GENERAL SUMMARY

A minimum of 24.5 weeks/955 (18.5 weeks/722 hours for the Classes of 2021 and 2022) hours are required for the M.D. degree. This provides a valuable opportunity for advanced study in the fields of medicine and the biological sciences through a process that is, as far as possible, open to the students' election. The chief constraint sets in when too many students ask for the same course at the same time. The sequence of electives can often be arranged to meet a student's desires and needs.

In addition to the 24.5 weeks of elective credit, **students must also complete two required electives**. These two electives include: one **advanced clerkship** (either the Advanced Clerkship in Critical Care or the Advanced Ambulatory Clerkship), and **one approved Subinternship experience**. Each of these clerkships is 4.5 weeks (3.5 weeks in AY2020-21) in length.

Students should consult freely with members of the faculty, the Associate Dean for Medical Student Affairs and Colleges Advisors in developing their programs. The ultimate responsibility for arranging the elective course of study rests with the student.

The electives chosen may be any of those formally listed in the elective book and in the catalog, or they may be developed on an individual basis with members of the faculty at Hopkins or elsewhere (approval of the Associate Dean for Medical Student Affairs is required for elective work carried out at other institutions). Only those electives which are considered to be a sound educational experience whether taken at Hopkins or at another institution will be approved.

The Associate Dean and Assistant Deans for Medical Student Affairs will be glad to help with arrangements for electives in other institutions. Remember that at least 15.5 weeks/605 hours (11.5 weeks/449 hours for the Classes of 2021 and 2022) must be taken with Johns Hopkins faculty.

Electives are an integral part of the required curriculum and students must register at the Registrar's Office for programs of study. Evaluation of the student's performance must be provided by the faculty preceptor.

### ADJUSTMENTS DUE TO GLOBAL COVID-19 PANDEMIC

JHUSOM medical students converted to a Block schedule in summer 2020 due to curriculum changes necessitated by the global COVID-19 pandemic. During AY2020-2021 we operated on a block calendar where a half block (3-3.5 weeks in length) is equivalent to a half quarter (4-4.5 weeks). Specific questions about the academic calendar, quarter, or block schedule can be directed to [medstdsk@jhmi.edu](mailto:medstdsk@jhmi.edu) for JH medical students or [vismed@jhmi.edu](mailto:vismed@jhmi.edu) for visiting medical students.

### BASIC DEFINITIONS AND RULES

The following information is made as complete as possible to assist in planning an elective program.

#### **Definitions of Terms Used in Guidelines:**

**Home Department:** any officially designated department of the Johns Hopkins University, including the Bloomberg School of Public Health and the Homewood Schools.

**Faculty Preceptor:** a faculty member who supervises an elective offering. In general, a faculty preceptor will have the rank of assistant professor or higher. The faculty preceptor will also be responsible for providing an evaluation of the student's work at the end of the elective period.

**Internship Advisor:** a faculty member assigned by a department to provide information about internships in the department and elsewhere. Although not directly responsible for electives, internship advisors are a valuable additional resource in planning a student's course of action. Internship advisors are listed at the end of these guidelines.

**Activities Recommended as Electives:** Elective credit will be given for a program of study that is considered by a faculty member to be a valuable intellectual experience and is approved by the department chairperson. Such activities may include advanced clerkships, individually arranged laboratory or clinical research, or advanced elective courses. Students may also undertake projects of their own within the framework of the laboratory or clinical activities of a home department so long as a faculty member approves it. However, unstructured, and unsupervised attendance at seminars and conferences is not acceptable for elective credit.

**Research Electives:** Research electives are arranged between the student and a faculty preceptor. No specific period of time need be spent on a project, but many faculty preceptors feel that a profitable research experience requires at least one full quarter (nine weeks). Students who undertake research during an elective quarter may also do some clinical work and attend conferences or seminars in any department if approved by their Faculty Preceptor.

**Other Activities in the Home Department:** During an elective period, students are considered junior members of the home department. As such, they are expected to participate in department conferences and other activities. Their role should be that of an active contributor rather than a passive observer.

**Electives Other Academic Institutions:** Elective study at other institutions must be approved by the Associate Dean for Medical Student Affairs. A letter of acceptance must be obtained from the sponsor at the outside institution and submitted along with the student's elective registration form and a list of goals and objectives. Assistance in arranging for electives elsewhere is also available in the Office of Medical Student Affairs. In general, externships or clinical clerkships at hospitals not directly affiliated with a medical school will not be approved.

**Evaluation of Performance during an Elective:** Faculty Preceptors will submit an evaluation and characterization of each student's performance at the end of each elective experience. Satisfactory completion of an elective is required in order to receive credit toward the M.D. degree.

**Stipends for Elective Activities: Students** may apply toward meeting the required 24.5 weeks/955 hours no more than 13.5 (10.5 weeks for Classes of 2021 and 2022) weeks of credit for which they also receive remuneration. Excluded from this limitation are prizes and merit awards (e.g., the Denison Scholarships). However, it is recognized that some sources of funding may prohibit award of academic credit.

**Vacation:** The curriculum provides flexibility in scheduling vacation periods.

## **FORMS AND ASSOCIATED DEADLINES AND RULES**

Students must complete a registration form for each elective experience in order to receive academic credit. The forms are available on the [JHUSOM Registrar Self-Service portal](#). After completing an elective registration form, the student must have it signed by the course director. If the elective is an experience outside of the Hopkins system, the student will need to obtain the signature of the Associate Dean for Medical Student Affairs. Students are expected to consult with their advisors about their academic program at regular intervals. It is the responsibility of the student to see that the Elective Registration Form is completed and submitted to the Registrar's Office in a timely manner. The deadline for submission of the elective registration form is prior to the start of the elective. Effective July 1, 2020, the Office of the Registrar will no longer accept retroactive elective registration forms.

**Drop Form – within the deadline:** The normal deadline for dropping electives is one month prior to the course, with the exception of a two-month deadline for dropping subinternships and certain advanced clerkships. If a student wants to drop a course within the deadline, he or she should submit a drop form to the course director and verify the signed copy has been submitted to the Office of the Registrar prior to submitting a new registration form for that period.

**Late Drop Form:** Changes will not ordinarily be permitted after the deadlines, though students may petition for such changes by submitting a drop form to the Course Director, and the Associate Dean for Medical Student Affairs. The completed form with appropriate signatures should be submitted to the Registrar's Office. Credit will not be given for course work other than that indicated on the most current registration form. If a student fails to

attend a course for which they have registered, an incomplete grade will be recorded on the transcript for that course, and the student will not be given credit for any other course during that time period.

#### **RULES CONCERNING REQUIRED SUBINTERNSHIPS AND CERTAIN ADVANCED CLINICAL ELECTIVES**

Certain advanced clinical electives (listed below) are very much in demand. One of the important advantages of these clerkships is the independent responsibility delegated to students so that they play a very active role in patient care. The trade-off is that students registering for these electives must accept the special responsibilities and obligations which they carry to patients, staff, their colleagues, and other members of the health care unit. Last minute dropouts from these courses impose burdens on the clinical unit and often mean lost opportunity for other students who want to participate in the elective. In view of the problems which have resulted from last minute dropouts, the Undergraduate Medical Educational Policy and Curriculum Committee (UMEPCC) adopted the following rules regarding the scheduling process for these rotations:

Students registering for advanced electives with significant patient care responsibilities are obliged to participate in such electives. Changes must be made two months prior to the start of such electives. If a drop is necessary past the deadline, the student may petition for a change by submitting a "Request to Drop Course After Deadline" to the Course Director, and the Associate Dean for Medical Student Affairs, and filing the completed form with the Registrar's Office. Credit will not be given for course work other than that indicated on the most current registration form. If student fails to attend a course for which they have registered, an incomplete grade will be recorded on their transcript for that course, and the student will not be given credit for any other course during that time period.

The following clinical experiences are governed by these rules:

#### **REQUIRED SELECTIVES**

##### ***Approved Subinternship Experience***

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**Prerequisite(s):** Respective Core Clerkship

**Availability/Duration:** Year-round, 4.5 weeks; follows SOM Academic Calendar quarter dates

**Drop Period:** All scheduling must occur through the Registrar's Office

##### **Subinternships that fulfill graduation requirements (JHH or Bayview only):**

Gynecology, Benign (JHH-Dr. Silka Patel)

Gynecology Oncology (JHH- Dr. Silka Patel)

Emergency Medicine (JHH – Dr. Sharon Bord)

Medicine (JHH-Dr. Amit Pahwa)

Medicine (Bayview – Dr. Janet Record)

Medicine-Hospitalist (JHH – Dr. Padmini Ranasinghe)

Medicine-Hospitalist (Bayview- Dr. Amteshwar Singh)

Obstetrics/GYN (Bayview Dr. Silka Patel)

Obstetrics/Maternal Fetal Medicine (JHH Dr. Silka Patel)

Pediatrics-Inpatient (JHH-Dr. Amit Pahwa)

Pediatrics-Harriet Lane (JHH –Dr. Nakiya Showell)

Pediatrics – Emergency Medicine (JHH – Dr. Lauren Kahl)

Surgery (JHH – Dr. Alodia Gabre-Kidan)

Surgery (Bayview – Dr. Alodia Gabre-Kidan)

Thoracic Surgery (JHH – Dr. Richard Battafarano)

Adult Orthopaedic Surgery (JHH – Dr. Brian Neuman)

Pediatric Orthopaedic Surgery (JHH – Dr. Paul Sponseller)

Neurosurgery (JHH – Dr. Tim Witham)

Plastic Surgery (JHH – Dr. Robin Yang)

Otolaryngology (JHH – Dr. Marietta Tan)

Urology (JHH – Dr. Amin Herati)

##### ***Advanced Clerkship in Critical Care***

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**Prerequisite(s):** Medicine or Surgery Core Clerkship, except PICU which has a Prerequisite of Pediatrics

**Availability/Duration:** Year-round, 4.5 weeks; follows SOM Academic Calendar quarter dates

**Drop Period:** All scheduling must occur through the Registrar's Office

**Site Assignments:**

Surgical Intensive Care (SICU) (JHH – Drs. Pamela Lipsett and Brad Winters)

Weinberg Intensive Care (WICU) (JHH – Drs. Pamela Lipsett and Brad Winters)

Medical Intensive Care (MICU) (JHH – Dr. Roy Brower)

Medical Intensive Care (MICU) (Bayview – Dr. Souvik Chatterjee)

Coronary Intensive Care (CICU) (Bayview – Dr. Marlene Williams)

Coronary Intensive Care (CICU) (JHH – Dr. Steve Schulman)

Pediatric Intensive Care (PICU) (JHH – Dr. Amanda Levin)

Neurocritical Care (NCCU) (JHH and Bayview – Dr. Marek Mirski)

Cardiac Surgery Intensive Care (CSICU) (JHH – Dr. Glenn Whitman)

**Advanced Ambulatory Clerkship**

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**Course Type:** Advanced Clinical Clerkship

**Department/Division:** Internal Medicine

**Course Director:** Dr. Sharon Dlhosh

**Contact:** Ms. Susan Shultz, 410-955-8336; [sshultz@jhmi.edu](mailto:sshultz@jhmi.edu)

**Faculty:** Drs. Sharon Dlhosh, Sujay Pathak, Naomi Cutler, Sara Mixter, Holly Dahlman, and others

**Availability/Duration:** Available year-round, every half-quarter

**Prerequisite(s):** At least the Medicine Core Clerkship is required; 2-3 clerkships, including Medicine, Pediatrics, or Women's Health preferred.

**Drop Period:** 1 month

**Description:** The Advanced Ambulatory Clerkship combines patient care experience in an outpatient primary care practice with additional experiences in the JH Bayview Geriatric Clinics, Memory Clinic, and Home Care visits. In their assigned outpatient primary care practice, students will work directly under the supervision of one (or more) preceptors in the field of General Internal Medicine or Family Practice. There is a curriculum of online modules that provides background in a number of topics that are relevant to primary and preventive care. Each student learns fundamental broad topics necessary to assess and provide care for adult patients along the continuum of aging.

**ADVANCED ELECTIVES**

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**Women's Health**

Subinternship in Gynecology

Subinternship in Gynecology and Obstetrics

Subinternship in Reproductive Endocrinology

Subinternship in Obstetrics/Maternal Fetal Medicine

**Medicine**

Advanced Clinical Clerkship in Internal Medicine

Advanced Clinical Clerkship in Medical ICU/CCU

Advanced Clinical Clerkship in Medicine/Rheumatology

Advanced Clinical Clerkship in Medicine-Bayview

Advanced Clinical Clerkship: CICU, Bayview

Endocrinology Clinical Clerkship

Subinternship in Infectious Disease-AIDS Service

Clinical Clerkship in Cardiology- Consult Service

Clinical Clerkship in Nephrology

Clinical Clerkship in Infectious Disease

**Neurology**

Advanced Neurology Clerkship

**Oncology**

Subinternship in Oncology

**Pathology**

Subinternship in Autopsy Pathology - JHH

Subinternship in Surgical Pathology - JHH

Subinternship in Autopsy and Surgical Pathology at Bayview and Sinai

**Pediatrics**

Pediatric Hematology Consultation Service

Subinternship in Neonatal Intensive Care Unit

Pediatric Pulmonary Subinternship

Clinical Clerkship in Adolescent Medicine

Neonatal Pediatrics Subinternship-Bayview

**Psychiatry**

Subinternship in Psychiatry

**Radiology**

Interventional Radiology Subinternship

**Surgery**

Subinternship in Surgery

General Surgery Subinternship-Bayview

Subinternship and Preceptor Program-Sinai

Advanced Clerkship in Burns (Subinternship)-Bayview

Subinternship in the Surgical Intensive Care Unit

Subinternship in Cardiac Surgery

Subinternship in Neurosurgical Surgery

Subinternship in Pediatric Surgery

Plastic Surgery Subinternship-Shock Trauma

Subinternship in Plastic Surgery

Subinternship in Transplantation Surgery

If you have any questions about these rules and procedures, please do not hesitate to contact Dr. Katherine Chretien, Associate Dean for Medical Student Affairs, (410-955-3416), or William Bryant Faust IV, EdD Associate Dean and Registrar, (410-955-3080).

**GLOSSARY OF TERMS TO DESCRIBE ELECTIVES****SUBINTERNSHIP:**

A rotation in which the student assumes the role of an intern, including primary care of patients and sharing night call

**CLINICAL CLERKSHIP:**

A rotation similar to a Core clerkship but with more responsibility for patient care and teaching

**CONSULT SERVICE:**

A rotation in which the student participates in the daily consultative activities of a particular division; may include the selected care of inpatients and outpatients of that division



**TUTORIAL:**

A rotation in which the student works with one or a very few faculty members in tutorial and didactic settings. May be in a clinical or basic science department

**BASIC RESEARCH:**

A rotation in which the student is engaged in laboratory research in a basic science department or in a clinical department

**CLINICAL RESEARCH:**

A rotation in which the student is engaged in research in clinical medicine. May sometimes include laboratory work

## RESIDENCY ADVISORS

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Anesthesiology & Critical Care Medicine	Dr. Tina Tran Bloomberg 6220 <a href="mailto:Ttran32@jhmi.edu">Ttran32@jhmi.edu</a>	410-955-7615
Dermatology	Dr. Daren Simkin <a href="mailto:Dsimkin1@jhmi.edu">Dsimkin1@jhmi.edu</a>	
Family Practice	Dr. Nancy Barr Franklin Square Hospital <a href="mailto:nancy.b.barr@medstar.net">nancy.b.barr@medstar.net</a>	
Medicine	Dr. Sanjay V. Desai <a href="mailto:sanjayvdesai@jhu.edu">sanjayvdesai@jhu.edu</a> Dr. Danelle Cayea <a href="mailto:dcayea1@jhmi.edu">dcayea1@jhmi.edu</a>	410-955-7910
Neurology	Dr. Raf Llinas <a href="mailto:rllinas@jhmi.edu">rllinas@jhmi.edu</a> Dr. Michael Kornberg <a href="mailto:michael.kornberg@jhmi.edu">michael.kornberg@jhmi.edu</a> Dr. Elisabeth Marsh <a href="mailto:ebmarsh@jhmi.edu">ebmarsh@jhmi.edu</a>	
Gynecology & Obstetrics	Dr. Betty Chou Phipps 227, JHH <a href="mailto:bchou1@jhmi.edu">bchou1@jhmi.edu</a>	410-955-6710
Ophthalmology	Dr. Henry Jampel Woods 177 <a href="mailto:hjampel@jhmi.edu">hjampel@jhmi.edu</a>	
Orthopaedic Surgery	Dr. Dawn LaPorte <a href="mailto:dlaport1@jhmi.edu">dlaport1@jhmi.edu</a>	
	Dr. Michael Ain JHOC 5253 <a href="mailto:main@jhmi.edu">main@jhmi.edu</a>	410-955-9300
Otolaryngology	Dr. Alexander Hillel <a href="mailto:ahillel@jhmi.edu">ahillel@jhmi.edu</a>	
Pathology	Dr. Charles Steenbergen <a href="mailto:Csteenb1@jhmi.edu">Csteenb1@jhmi.edu</a>	410-502-5982
Pediatrics	Dr. Nicole Shilkofski Bloomberg 8464	410-955-2727

	<a href="mailto:nshilko1@jhmi.edu">nshilko1@jhmi.edu</a>	
Psychiatry	Dr. Vinay Parekh Meyer 4-181, JHH <a href="mailto:vparekh1@jhmi.edu">vparekh1@jhmi.edu</a>	410-955-5514
Radiology	Dr. Lilija Solnes <a href="mailto:lsolnes1@jhmi.edu">lsolnes1@jhmi.edu</a>	
Surgery	Dr. Pamela Lipsett Osler 603 <a href="mailto:plipsett@jhmi.edu">plipsett@jhmi.edu</a>	410-955-3739
Urology	Dr. Marisa Clifton Marburg 144A <a href="mailto:mmeyer18@jhmi.edu">mmeyer18@jhmi.edu</a>	410-955-2139

Internship advisors are available to assist students seeking post-graduate appointments. Students applying in these areas should make appointments to see at least one of the departmental advisors. Students are encouraged to seek additional advice from a variety of faculty, house staff, college advisors and peers. A broad base of information is helpful.

It may also be helpful to talk to some of our recent graduates who are at other institutions. The Office of Medical Student Affairs can provide names and addresses to assist you.

There are some students who will be going into residencies in disciplines other than those listed. While the Associate Dean of Medical Student Affairs can advise students concerning that process, it is also important that students speak with the department or division director in the discipline in which they have interest.

### **DEPARTMENTAL RECOMMENDATIONS**

The following statements, provided by the clinical departments, suggest curricular choices for students wishing to enter post graduate training in a particular specialty.

#### **ANESTHESIOLOGY**

The basic recommendations for entrance into a residency in Anesthesiology and Critical Care Medicine are:

1. An interest and demonstrated proficiency in basic physiological and pharmacological principles.
2. A solid background in internal medicine, surgery, and/or pediatrics. Anesthesiology requires a clinical base year (medicine, surgery, pediatrics, or transitional) which is either a separate preliminary year or twelve months of basic experience incorporated into the residency itself, depending upon the program. The preliminary year focus should be chosen based on your preferences and skills, although internal medicine is often considered most useful. Elective suggestions for medical students include cardiology, pulmonary medicine, emergency medicine, surgical intensive care, and a medicine or surgery sub-internship.
3. A four-week elective in anesthesiology will allow you to develop an informed specialty decision and permit us to support your application as best we can. Further advanced electives in anesthesiology or anesthesia sub-specialties can be helpful to assist in career decisions and can be tailored to your interests but are not necessary. It is typically not helpful to do away or "audition" rotations in anesthesia.
4. Research in any area (basic science, clinical, biomedical engineering, information management, health policy, etc.) can be relevant to anesthesiology and can greatly enhance an application, although it is not expected or required unless you anticipate an academic career.

5. Personal characteristics suggesting promise in anesthesiology, which include an inquisitive nature, dynamic decision-making skills utilizing multiple variables and hypothesis testing, the ability to maintain a high level of vigilance and detail-oriented approach to patient care, good procedural skills, the desire to work as part of a team, a willingness to be flexible and adapt to different work environments and new technology, and the ability to organize resources and maintain a demeanor of effective leadership in crisis situations.

*Dr. Colleen Koch*

*Chair*

*Department of Anesthesiology and Critical Care Medicine*

## **DERMATOLOGY**

We welcome students to take a dermatology clerkship regardless of the medical discipline they intend to pursue. However, this should take place towards the end of their third year after completing several core clerkships including Medicine, Surgery and Pediatrics. We believe students should receive as broad exposure to medicine as possible before taking our introductory clerkship (Clinical Clerkship in Dermatology) and making career decisions. If further experience/learning is desired, we also suggest taking our Advanced Clinical Clerkship in Dermatology. For those students with a career interest in Dermatology, taking electives in related sub-specialties such as Rheumatology, Immunology, and Plastic Surgery are encouraged.

*Dr. Daren Simkin*

*Assistant Professor, Department of Dermatology*

*Assistant Residency Program Director*

*Director of Medical Student Education*

*Medical Student Rotation Coordinator:*

*Shanika Bennett*

[sbenne17@jhmi.edu](mailto:sbenne17@jhmi.edu)

## **EMERGENCY MEDICINE**

The student interested in a career in Emergency Medicine is well advised to take advantage of the career counseling services available in the Department of Emergency Medicine to aid them in their decision-making process. Students can be advised in the following areas:

1. Personal life/goal planning
2. Careers in Emergency Medicine
3. Medical school rotations
4. Application preparation
5. Interview skills
6. Research exposure

The Department of Emergency Medicine at Johns Hopkins is particularly interested in those students who wish to pursue academic careers, but department members will be happy to advise students contemplating community hospital or private practice careers.

Medical student rotations should emphasize a well-balanced program including: emergency medicine, pediatric emergencies, general surgery and trauma, internal medicine, cardiology, anesthesia, general pediatrics, obstetrics & gynecology, and intensive care rotations. Other recommended rotations include: psychiatry, ophthalmology, orthopaedics, plastic surgery, otolaryngology, neurology, and pulmonary/critical care medicine. Research experience is highly recommended, and opportunities are offered through the Johns Hopkins Department of Emergency Medicine.

Those interested in applying for the Emergency Medicine training program at Johns Hopkins are advised to arrange elective time in late third year or early fourth year. Since specialty training in Emergency Medicine is among the most competitive in the country, it may be wise to arrange an elective at another institution also. Faculty members in the Department of Emergency Medicine can advise in this regard.

*Dr. G. D. Kelen  
Director  
Department of Emergency Medicine*

### **GYNECOLOGY & OBSTETRICS**

For those students who are considering a career in Obstetrics and Gynecology or who desire additional experience in Women's Health, a Subinternship in Obstetrics and/or Gynecology is available. Successful completion of a core clerkship in Obstetrics and Gynecology is a prerequisite for all subinternships.

If the student wishes to take subspecialty electives within the department, there is a choice of gynecology, gynecologic pathology, gynecologic oncology, reproductive endocrinology and infertility, maternal-fetal medicine, family planning, and pelvic medicine and reconstructive surgery, as well as many opportunities for research. Clinical electives are primarily offered when a core clerkship is not in session. Core clerkship dates may be found on the department's medical student website:

[www.hopkinsmedicine.org/gynecology\\_obstetrics/education/medstudents/](http://www.hopkinsmedicine.org/gynecology_obstetrics/education/medstudents/)

Since Obstetrics and Gynecology is a primary care field, the most appropriate use of elective time for students who are committed to specialty training in Obstetrics and Gynecology involves completion of the various subspecialty medical or surgical electives. Although the student is welcome, it is not necessary to take elective courses within the Department of Gynecology and Obstetrics.

All requests for subinternships and electives from the Registrar's Office are initially screened through the department's Office of Medical Student Education (contact Rebecca Slattery at 410-614-0088). All requests for research electives may be directed toward individual faculty, or the student may contact Dr. Silka Patel or Ms. Rebecca Slattery for assistance in finding the appropriate research mentor.

*Dr. Andrew J. Satin            Dr. Betty Chou  
Chair                            Director of Resident Education  
Department of Gynecology & Obstetrics    Department of Gynecology & Obstetrics*

*Dr. Silka Patel  
Women's Health Clerkship Director  
Department of Gynecology & Obstetrics*

### **INTERNAL MEDICINE**

We are looking for people who will become healers and leaders in Internal Medicine. Most successful applicants to the Osler Medical Housestaff Training program will have performed in an outstanding fashion on multiple internal medicine rotations and will have explored beyond the boundaries of the traditional curriculum, e.g., becoming involved in research or community service. We offer a commitment to outstanding patient care, a collegial environment, and an intellectually stimulating experience.

*Dr. Sanjay V. Desai  
Director  
Osler Residency Training Program*

### **NEUROLOGY CORE CLINICAL CLERKSHIP**

Neurology is part of the core curriculum at the Johns Hopkins University School of Medicine. It is preferred, but not required that students complete their Medicine clerkship before taking Neurology. The clerkship includes both inpatient and consultation services as well as an outpatient experience. For those with an interest in the area of Pediatric Neurology, a request may be made to be placed on that service.



**OPHTHALMOLOGY**

Students who plan to apply for a residency in Ophthalmology should:

1. Meet with the Director of Medical Student Education in Ophthalmology, Dr. Henry Jampel , to discuss scheduling of clerkships and electives: [hjampel@jhmi.edu](mailto:hjampel@jhmi.edu); 410-955-6052
2. Consider the following scheduling guidelines:  
Clerkships in Medicine and Surgery, the General Clinical Elective in Ophthalmology, and any other clerkship or elective in a field that is a possible career choice should be scheduled as early as possible in the third year.
3. Students applying for residency in Ophthalmology should plan to do two or three electives in the field.

Other electives that students going into Ophthalmology have found helpful (but not required) are the Advanced Clerkship in Internal Medicine; Subinternship in Medicine at Good Samaritan (Rheumatology or Pulmonary); Dermatology; Radiology and Infectious Disease.

**PATHOLOGY**

Electives in Pathology provide students an excellent way of broadening their knowledge of medicine and determining their level of interest in the specialty. Most pathology electives give students firsthand knowledge of the central role pathology plays in the diagnosis of disease, and as such, are valuable for students going into almost any clinical specialty. Both general and subspecialty electives in Pathology are available. Electives in anatomic pathology focus on morphologic and histologic diagnosis; those in the clinical laboratory illustrate the effective use and interpretation of laboratory testing, while others provide insight into basic pathogenesis of disease. Students who have already made a firm decision to enter postgraduate training in Pathology should contact an advisor in the department to gain assistance in planning a balanced elective program.

*Dr. Marc Halushka*  
*Deputy Director for Education*

*Dr. Ralph Hruban*  
*Director*  
*Department of Pathology*

**PEDIATRICS**

Elective experiences offered in the Department of Pediatrics include subspecialty consultation services, research opportunities and subinternships on a variety of services. Subspecialty electives help the student develop specific skills and knowledge and emphasize the development of an approach to patients who have been referred because of their particular problems. Subinternships, whether in the neonatal intensive care unit, on the general pediatric inpatient units, or in the Harriet Lane Clinic, offer the student an opportunity to manage a variety of patients with a higher level of independence than they experienced during the Core clerkship. A wide range of clinical and laboratory research experiences provide students with a close working relationship with faculty mentors and a chance to help define new knowledge, whether the student is an experienced researcher or a beginner. Members of the pediatric faculty are available to provide guidance and advice for students who seek further experience in pediatrics, whether he/she is certain of the career path or is in the exploration stage. Either Dr. Christopher Golden (Pediatrics Clerkship director) [cgolden@jhmi.edu](mailto:cgolden@jhmi.edu) or Dr. Nicole Shilkofski, (Vice-Chair for Pediatric Education) 410-955-2727 would be happy to discuss elective choices.

*Dr. Tina Cheng*  
*Director*  
*Department of Pediatrics*

## **PSYCHIATRY**

Although there are numerous clinical and research electives available in the department, they should not be considered as prerequisites for residency training in psychiatry.

For those students who are considering doing a psychiatry residency, we strongly recommend that they do a subinternship in Psychiatry. However, elective time in psychiatry for these students is also encouraged as it will allow them to clarify their choice and to develop new areas of interest in the field.

We find that the subinternship experience is especially good for those students who wish to find out if they will like psychiatry as a career before making decisions about entering the field. It is also quite helpful for those students who are sure that they are not going into psychiatry but realize that a broadened clinical experience in this field would be useful for them in their chosen specialty. Students who think they might be interested in training in psychiatry should talk with Dr. Vinay Parekh (410-955-5514) as early as possible to get answers to questions and to get advice concerning their educational plans.

*Dr. Vinay Parekh  
Director, Psychiatry Clerkship and Clinical Electives*

## **RADIOLOGY**

Opportunities are available for research projects in magnetic resonance spectroscopy, magnetic resonance imaging, neuroradiology, cardiovascular interventional radiology, computed tomography, positron emission tomography, and diagnostic ultrasound. The successful completion of a research project often enhances a student's likelihood of being selected by a Radiology residency program.

*Dr. Karen Horton  
Director  
Department of Radiology*

## **SURGERY**

Recommended electives: Gastroenterology, Infectious Disease, Nephrology, Cardiology, Pulmonary, and Anesthesiology.

Recommended - Research Experience. This need not be done in a surgical laboratory but may have application to the care of surgical patients. Research in either the laboratory or clinical research setting is acceptable.

Surgery electives that are helpful in making career decisions for other students include: Surgical Subinternship, Surgical Intensive Care, or Elective Clerkships in the Surgical Specialties

Students planning to apply for non-surgical training programs may also find the above surgical electives at Johns Hopkins of benefit to their medical education. Applicants to the Hopkins surgical program are evaluated on an individual basis, and those wishing to be considered for a Hopkins appointment should discuss their decision with either Dr. Alodia Gabre-Kidan (agabrek1@jhmi.edu), or the Director of the appropriate Surgical Specialty Department.

## **OTOLARYNGOLOGY – HEAD AND NECK SURGERY**

Medical students interested in a postgraduate career in Otolaryngology-Head and Neck Surgery should be well grounded in the basic principles of surgery, medicine, and pediatrics. During the third year of medical school, interested students can participate in a two-week elective in Otolaryngology-Head and Neck Surgery during their basic surgical clerkship. The experience gained in this rotation provides front line exposure to all aspects of clinical and surgical care provided within our discipline. For those who are not able to match to that elective, as well as

those who wish more of an exposure, there is a senior year elective option which should be taken early in the year. Other useful related electives include Neurosurgery, Ophthalmology, Plastic Surgery and Anesthesiology.

Throughout the United States today, resident candidates are being advised to pursue a meaningful research experience as a medical student. Exposure to well-designed research rotations provides an opportunity to apply prospective, controlled experimental methodologies, and immeasurably strengthens an application for a residency position in Otolaryngology-Head and Neck Surgery.

*Dr. David Eisele  
Director  
Department of Otolaryngology-Head and Neck Surgery*

### **ORTHOPAEDIC SURGERY**

We highly encourage all medical students considering application to an Orthopaedic resident training program to work with our surgeons. All faculty are involved in selecting candidates for post graduate training in Orthopaedics. A student will do best as an Orthopaedic subintern if they are well grounded in surgery and medicine prior to their subinternship. They should take their core clerkships in these fields and exploit the opportunities to learn the fundamentals of Orthopaedics prior to taking an advanced Orthopaedic clerkship. I recommend taking an advanced Orthopaedic clerkship in the institution or with members of the faculty with whom they would like to train. I advise that may take more than an Orthopaedic rotation, Adult Clinical Orthopaedics and Pediatric Orthopaedics. In general, it is best to have electives in two-three training institutions.

Basic medical and surgical clerkships and an advanced Orthopaedic elective should be completed by the end of September of the fourth year, prior to the selection process.

The formal application procedure for the residency, which requires an integrated internship, begins towards the end of the junior year. In addition to obtaining all the relevant application materials, spending time discussing the various programs with myself as well as another Orthopaedic faculty member at Hopkins can be very useful in paring down the application list.

Appropriate curriculum vitae should be given to all those who have been asked to write letters of recommendation, as well as a list of the people and addresses to which these letters should be sent. The appropriate form of this list should be worked out with each individual person who is writing recommendations for you. Inquire about the preferred format individually.

Although some additional Orthopaedic electives can be taken during the fall of the fourth year, the fourth year is an ideal time to focus education in the medical fields for a unique experience during an Orthopaedic residency.

*James R. Ficke, M.D.  
Director  
Department of Orthopaedic Surgery*

### **UROLOGY**

Urology is a field which integrates both medical and surgical managements of urinary tract system and the male reproductive organs. Urology has been on the cutting-edge of surgical technology including microsurgery, lasers, and minimally invasive surgery (laparoscopy and surgical robotics). Urology is one of the most competitive and highly sought-after specialties to enter for physicians.

The best preparation for students who are considering a career in Urology is to obtain a strong background in surgery and internal medicine. This includes elective rotations in general surgery, a sub-internship on the Urology service, ICU rotation, and advanced clerkships in internal medicine. We also strongly recommend students to do a research project with our clinical or research faculty. This exposure allows the student an opportunity to complete a project, get exposure to the urology faculty who can then write a strong letter of recommendation and allow the



student to assess their own enthusiasm for the field. A strong research project is an invaluable asset when interviewing for residency positions.

*Marisa Clifton, M.D.  
Residency Program Director  
Department of Urology*

## ANESTHESIOLOGY AND CRITICAL CARE MEDICINE

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ME:570.699

### ANESTHESIOLOGY RESEARCH

**Course Type:** Basic Research

**Department/Division:** Anesthesiology and Critical Care Medicine

**Course Director:** Dr. Tina Tran and Dr. Jed Wolpaw

**Course Coordinator:** Emily Jensen, [ejense11@jhmi.edu](mailto:ejense11@jhmi.edu)

**Telephone Number:** 410-955-7609

**Faculty:** Anesthesiology faculty

**Availability/Duration:** All year by special arrangement

**Prerequisite(s):** Clinical preceptorship in anesthesiology recommended but not required; identifying research mentors prior to the start of elective is highly recommended.

**Drop Period:** 1 month

**Description:** Many opportunities exist within the department for research in areas of basic science (molecular, genetic, cell biology, basic pathophysiology, biochemistry), clinical trials, biomedical engineering, information management, outcomes research and data mining, and health policy & safety initiatives. Specific research opportunities should be reviewed on the departmental website. The interested student should contact the faculty member supervising the research prior to registering for the elective.

### ADVANCED CLINICAL CLERKSHIP IN PEDIATRIC ANESTHESIOLOGY

**Course Type:** Advanced Clinical Clerkship

**Department/Division:** Anesthesiology and Critical Care Medicine

**Course Director:** Dr. Samuel Vanderhoek

**Telephone Number:** 410-955-7610

**Faculty:** Pediatric Anesthesiology staff

**Availability/Duration:** 4 weeks

**Prerequisite(s):** Pediatrics Core Clerkship and clinical preceptorship in anesthesiology

**Drop Period:** 1 month

**Description:** The clerkship in Pediatric Anesthesiology is designed for students interested in pediatrics, pediatric anesthesia, or pediatric surgery, and introduces them to the perioperative anesthetic management of the pediatric patient. Under close supervision by faculty, fellows and residents, students will learn and apply the principles of preoperative evaluation of children, intraoperative monitoring techniques, pharmacology of anesthetic and related drugs, and immediate postoperative management. In addition, students will be exposed to and participate in anesthetic procedures such as airway management and establishment of vascular access. As the clerkship progresses, students will have the opportunity to participate in cases of increasing complexity. Students will participate in the full range of residency didactics including morning lectures, college days, simulation sessions. Students are assigned to the operating rooms at the Charlotte R. Bloomberg Children's Center and are notified by the OR schedulers of the actual daily assignment the night before.

### BASIC CLERKSHIP IN ANESTHESIOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Anesthesiology and Critical Care Medicine

**Course Director:** Dr. Tina Tran and Dr. Jed Wolpaw

**Course Coordinator:** Emily Jensen, [ejense11@jhmi.edu](mailto:ejense11@jhmi.edu)

**Faculty:** Department of Anesthesiology faculty

**Availability/Duration:** Available to Third and Fourth Year students (last quarter 2<sup>nd</sup> year); 4 weeks

**Prerequisite(s):** None

**Drop Period:** 2 months

**Description:** Students will spend the basic elective working in the general operating rooms directly alongside Anesthesiology providers (attending and residents) applying physiological and pharmacological principles to intra-

operative patient care. Cardiovascular and respiratory physiology will be central to this learning process. Students will learn basic airway skills including mask ventilation and intubation, placing intravenous and arterial access and additional appropriate monitoring as dictated by the type of surgery and the patients' co-morbidities. They will also learn the principles of anesthetic management and the interactions between surgical trauma, anesthesia and the patient's baseline medical issues including appropriate pre-operative evaluation, intra-op management and post-op transition. Hemodynamic management including intravenous fluid therapy, vasopressor use and transfusion practice will be emphasized. Students will learn how anesthetic management varies based on patient age, co-morbidities, and the specific surgical procedure such as abdominal surgery and intracranial surgery.

### ADVANCED CLINICAL CLERKSHIP IN ANESTHESIOLOGY

**Course Type:** Advanced Clinical Clerkship  
**Department/Division:** Anesthesiology and Critical Care Medicine  
**Course Director:** Dr. Tina Tran and Dr. Jed Wolpaw  
**Course Coordinator:** Emily Jensen, [ejense11@jhmi.edu](mailto:ejense11@jhmi.edu)  
**Faculty:** Department of Anesthesiology faculty and staff  
**Availability/Duration:** 4 weeks  
**Prerequisite(s):** Basic Anesthesiology Clerkship  
**Drop Period:** 2 months

**Description:** This clerkship will allow students who have completed a Basic Anesthesiology Clerkship to expand their experiences in anesthesia practice. Students may create their own experience by either choosing to spend the clerkship doing general operating room cases or by seeking to gain experience in sub-specialty areas of anesthesiology including cardiac anesthesia, obstetrics anesthesia, neuroanesthesia, pediatric anesthesia and pain management. The amount of time a student chooses to spend in any one or more of these sub-specialty areas is customizable to meet the student's interests. This elective is recommended for students who are interested in applying to an Anesthesiology residency program. Note: ICU is now a separate elective and no longer available through this course previously neurocritical care and cardiac-surgical critical care were available as an advanced elective through the Anesthesiology and Critical Care Medicine Dept. You must register for an ICU clerkship separately through Dr. Scott Stephens' office.

### COMBINED SUBINTERNSHIP IN EMERGENCY MEDICINE AND ANESTHESIOLOGY

**Course Type:** Subinternship  
**Department/Division:** Emergency Medicine and Anesthesiology and Critical Care Medicine  
**Course Director:** ACCM: Tina Tran, MD, Jed Wolpaw, MD  
EMed: Sharon Bord, MD Amelia Pousson, MD Julianna Jung, MD  
**Contact:** ACCM: Tina Tran, [ttran32@jhmi.edu](mailto:ttran32@jhmi.edu) - clerkship co-director  
Jed Wolpaw, [jwolpaw@jhmi.edu](mailto:jwolpaw@jhmi.edu) - clerkship co-director  
Emily Jensen, [ejense11@jhmi.edu](mailto:ejense11@jhmi.edu) - sr. administrative coordinator  
Priyanka Dwivedi, [pdwived1@jhmi.edu](mailto:pdwived1@jhmi.edu) - medical training program manager

EMed: Sharon Bord, [sbord1@jhmi.edu](mailto:sbord1@jhmi.edu), Course Director  
Amelia Pousson, [apouso1@jhmi.edu](mailto:apouso1@jhmi.edu), Course Associate Director  
Jules Jung, [jjung@jhmi.edu](mailto:jjung@jhmi.edu), Course Associate Director  
Pam McCann, [pmccann3@jhmi.edu](mailto:pmccann3@jhmi.edu), Course Coordinator

**Faculty:** Anesthesiology and Emergency Medicine Faculty  
**Availability/Duration:** 3 weeks  
**Prerequisite(s):** prior Anesthesiology clerkship, prior Emergency Medicine clerkship, evidence of observership, letter of intent/interest by medical students  
**Drop Period:** 1 month

**Description:** The combined EM/ACCM Advanced Clerkship will provide students with the opportunity to rotate and have clinical experiences in both departments. The fields of EM and anesthesiology have significant overlap in terms of airway management and management of critically ill patients in the ED, OR and ICU settings. This clinical rotation will highlight some of the overlap between these specialties as well as their unique aspects and will help prepare students for the combined EM/Anesthesia residency program.

#### EMed:

This course is about key concepts in the assessment, management, and disposition of patients in the Emergency Department. It builds on what you learned in your prior rotation in Emergency Medicine, allowing you to apply those concepts by serving as the primary provider for acutely ill and injured patients in the ED. What you learn in this clerkship will prepare you not only to evaluate and manage patients in the ED setting, but also to address acute concerns that arise in the care of hospitalized and ambulatory patients. The course primarily focuses on supervised clinical practice, though you will also complete an academic writing exercise, and participate in didactics and Residency Conference.

#### Overall Course/Clerkship Objectives

By the end of this clerkship, all students will be able to:

1. Perform a focused history and physical examination based on an emergent chief complaint.
2. Present clinical findings, assessment, and plan in an organized and cohesive fashion.
3. Describe the differential diagnosis, evaluation, and management of common ED presentations including but not limited to: Chest pain, Vaginal bleeding or discharge, Shortness of breath, GI bleeding, Headache, Hyperglycemia, Abdominal pain, Fever, Altered mental status, Seizure, Minor trauma, Acute weakness, Syncope.
4. Interpret common emergency diagnostic tests, including laboratory studies, electrocardiograms, plain films, and CT scans.
5. Manage all aspects of care for assigned patients in the ED, including ordering tests and treatments, communicating with consultants and care team, and planning for disposition.
6. Demonstrate appropriate interpersonal communication skills in interactions with patients, family members, colleagues, and supervisors
7. Describe and/or demonstrate a basic approach to the following procedures when encountered in clinical practice: ABG, IV placement, Central line placement, Lumbar puncture, Endotracheal intubation, Nasogastric tube placement, CPR, Decompression of pneumothorax, Pericardiocentesis, Laceration repair, Medical resuscitation, Trauma resuscitation
8. Participate as a member of the critical care resuscitation team for seriously ill and injured patients.

#### ACCM:

During the Anesthesiology clerkship, students work directly with a senior anesthesia resident in ORs and procedural suites throughout the hospital to provide general anesthesia and monitored anesthesia care to a wide variety of patients.

Students are active participants in patient care and will perform important life-saving skills including: face mask ventilation, intravenous catheter placement, airway device insertion and management (laryngeal mask airway placement endotracheal intubation), IV medication administration, interpretation of vital signs, hemodynamic changes, and imaging studies. Students may perform or assist with advanced skills such as fiberoptic intubations, arterial line placement central line placement, epidural catheter placement, and ultrasound guided procedures. The skills acquired during the clerkship in anesthesiology are broadly applicable to a wide variety of fields and are particularly useful in rapid response and code situations. Students are active participants in comprehensive perioperative care from conducting the preoperative evaluation prior to induction, to performing procedures and management during and after induction, to signing out to the PACU/ICU team postoperatively. Students receive one-on-one teaching in the operating room from anesthesia residents and attendings who are engaged, active teachers and who view students as integral members of the team. Students learn about physiology and pharmacology in real-time by administering medications and other interventions and observing the changes in hemodynamics. Students are assigned with the overnight call team to give them exposure to emergency cases, traumas, codes, and other types of cases may not occur during the day. Simulation sessions and didactics augment

the intraoperative learning experience during the rotation. A case discussion session at the conclusion of the clerkship will include a discussion of fundamental anesthesia concepts and presentation of a medically challenging clinical case. Many students have gone on to present their clinical cases at national and international scientific meetings.

Objectives are cumulative and students will continue to practice and build on clinical skills as the clerkship progresses.

By the end of Week 1, students will:

1. Perform a comprehensive airway anatomy exam prior to induction of anesthesia
2. Assist in the pre-operative OR preparation, including IV set up, airway equipment, medications, and anesthesiology machine and monitor check
3. Perform mask ventilation skills including insertion of airway adjunct devices
4. Learn direct laryngoscopy and LMA placement techniques
5. Learn peripheral IV placement techniques with and without ultrasound guidance
6. Classify patient's health status and medical co-morbidities based on ASA status
7. Understand and research the pharmacology of different medications used for induction, maintenance, and emergence from anesthesia.
8. Perform focused pre-anesthesia assessments and physical exams
9. Attempt arterial line placement and other advanced techniques
10. Interpret intra-operative monitors
11. Develop a perioperative plan for patient management

By the end of week 2, students will:

1. Name criteria for extubation, both clinical and subjective considerations
2. Explain the concept of MAC, particularly how it varies in different patients
3. Identify co-morbidities that may affect anesthetic management
4. Discuss the components of the ASA difficult airway algorithm
5. Perform advanced airway techniques, such as video laryngoscopy
6. Show proficiency and independence in mask ventilation and IV insertion techniques
7. Provide detailed clinical sign out or handoff reports to PACU/ICU teams
8. Independently prepare an OR for the start of a case (including medications, airway equipment, suctioning, IV tubing, etc.)
9. Interpret hemodynamic changes and provide interventions during intraoperative management

## BIOLOGICAL CHEMISTRY

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### RESEARCH OPPORTUNITIES IN THE DEPARTMENT OF BIOLOGICAL CHEMISTRY

DR. MICHAEL CATERINA

Molecular and physiological mechanisms responsible for pain sensation.

DR. ROBERT COLE

Understanding the role of proteins, their modifications, adductomes and interactomes in human health and disease through innovative proteomics.

DR. RYUYA FUKUNAGA

Biology and mechanism of post-transcriptional gene regulation by small silencing RNAs and RNA-binding proteins.

DR. ERIN GOLEY

Bacterial cell biology: growth and adaptation mechanisms of bacteria in different environments.

DR. STEVE GOULD

HIV/AIDS; retrovirology; exosome biogenesis; alloimmunity.

DR. SETH MARGOLIS

The regulation of protein homeostasis in nervous system development and disease.

DR. MOLLIE MEFFERT

The regulation of neuronal gene expression in health and disease; impact of noncoding RNAs and RNA-binding proteins.

DR. TAMARA O'CONNOR

Molecular mechanisms of bacterial pathogenesis.

DR. JOEL POMERANTZ

Functional specificity and design of signal transduction pathways.

DR. DANIEL RABEN

Biochemistry and chemistry of lipids and lipid metabolizing enzymes involved in signaling cascades.

DR. KAREN REDDY

Understanding how the nuclear periphery and other subcompartments contribute to general nuclear architecture and to specific gene regulation.

DR. GEORGE SACK

Structure of human amyloid A proteins and their role in inflammation.

DR. DAVID SHORTLE

Computational approaches to refining protein models and de novo structure prediction.

DR. MICHAEL WOLFGANG

CNS control of metabolism; neuronal metabolism; neurochemistry.

DR. NATASHA ZACHARA

The role of intracellular glycosylation, O-GlcNAc, in survival signaling models of oxidative stress.

## BIOMEDICAL ENGINEERING

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ME:210.699

### **BIOMEDICAL ENGINEERING RESEARCH**

**Research: Biomedical** Engineering has emerged as one of the most exciting interdisciplinary research fields in modern science. Biomedical engineers apply modern approaches from the experimental life sciences in conjunction with theoretical and computational methods from the disciplines of engineering, mathematics, and computer science. Our unique positioning within the Johns Hopkins Whiting School of Engineering and the Johns Hopkins School of Medicine provides students and faculty with opportunities to engage with other leading engineers, scientists, and physicians. Together, we are developing the disruptive technologies that will transform the practice of medicine and improve human health. Many of these technologies are currently used in the clinic to diagnose and treat diseases, from cardiac arrhythmias and sepsis to Alzheimer's and cancer. Examples of these advances include new drug delivery methods, diagnostic imaging devices, artificial organs and orthopedic implants, prosthetic limbs, and patient-specific quantitative models of disease. A comprehensive list of faculty research is located on the department website [www.bme.jhu.edu](http://www.bme.jhu.edu). Students interested in participating in a research project should contact the faculty member.

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS**

**Courses:** Courses offered by the Department of Biomedical Engineering are taught on the Homewood Campus. A full list of courses for each semester can be found on the Registrar's Office website: <http://web.jhu.edu/registrar>.

## BIOPHYSICS AND BIOPHYSICAL CHEMISTRY

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ME:100.699

### RESEARCH TOPICS IN BIOPHYSICS

**Course Type:** Basic Research

**Department:** Biophysics & Biophysical Chemistry

**Course Director:** Dr. L. Mario Amzel

**Telephone Number:** 410-955-3955

**Faculty:** Drs. L.M. Amzel, J. M. Berger, D. Frueh, T. J. Ha, A. Lau, J. Sohn, C. Wolberger, and J. Xiao

**Availability:** This course is also available as an elective to medical students, to postdoctoral students, and to other qualified persons. Visiting medical students must follow JHUSOM quarter dates

**Description:** The department has a particular focus in the molecular structures of proteins and nucleic acids, and their functional interrelationships. Research projects may be arranged with any departmental faculty member. Projects can be laboratory or library based, and of varying lengths.

### RESEARCH OPPORTUNITIES

DR. AMZEL

Structure enzymology of redox and phosphoryl transfer enzymes: MICAL, peptidyl amidating monooxygenase, PI3K, FPPS and Nudix hydrolases; channels and transporters; selected areas of structural thermodynamics.

DR. BERGER

Structural and mechanistic studies of protein/nucleic acid machines and assemblies that control DNA replication and chromosome organization.

DR. FRUEH

Structural and dynamic studies of active enzymatic systems by Nuclear Magnetic Resonance (NMR). Mechanisms of domain communication in non-ribosomal Peptide Synthetases. Development of NMR methods to study large and dynamic proteins.

DR. HA

Single-molecule detection and super-resolution imaging methods to study complex biological systems, including DNA/RNA/protein interactions, chromatin, and cellular mechanics.

DR. LAU

Structural thermodynamics of biomolecular association and conformational transitions, computational and experimental approaches.

DR. SOHN

Mechanistic studies of foreign-DNA sensing pathways in innate immunity.

DR. WOLBERGER

Structure-based mechanism of transcription regulation and ubiquitin signaling.

DR WU

Single-molecule microscopy/spectroscopy methods to study the molecular dynamics in live cells.

DR. XIAO

Dynamics of gene regulation and cell division using single-molecule fluorescence microscopy and live-cell analysis.

### COMPUTER MODELING OF BIOLOGICAL MACROMOLECULES-LECTURE

**Course Type:** Other

**Department:** Biophysics and Biophysical Chemistry

**Course Director:** Dr. L. Mario Amzel

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BIOPHYSICS AND BIOPHYSICAL CHEMISTRY



**Telephone Number:** 410-955-3955

**Faculty:** Drs. L. M. Amzel, B. Garcia-Moreno, A. Lau, D. Shortle, and T. Woolf

**Availability/Duration:** Two hours per week; second semester.

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** Lectures will offer an introduction to the mathematical aspects of computer representation and manipulation of macromolecules, as well as discussions of important topics in computational chemistry of macromolecules including forces and potential fields, molecular mechanics, electrostatics, Monte Carlo methods, homology modeling, docking, and other modeling topics.

#### COMPUTER MODELING OF BIOLOGICAL MACROMOLECULES (LAB)

**Course Type:** Other

**Department:** Biophysics & Biophysical Chemistry

**Course Director:** Dr. Mario Bianchet

**Telephone Number:** 410-614-8221

**Faculty:** Dr. Mario A. Bianchet

**Availability/Duration:** Two hours per week; second semester; limited enrollment

**Prerequisite(s):** None

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The laboratory course will familiarize students with practical aspects of molecular modeling. It teaches tools to create and manipulate computer generated models of biological-interest molecules. Techniques such as comparative modeling will be introduced.

#### RESEARCH PROJECTS IN BIOCHEMISTRY, BIOPHYSICS AND MOLECULAR BIOLOGY

**Course Type:** Basic Research

**Department:** See below

**Course Director:** All members of the BCMB Graduate Program

**Faculty:** All members of the BCMB Graduate Program

**Drop Period:** 1 month

**Description:** (Jointly with all the Basic Sciences: Biological Chemistry, Biophysics and Biophysical Chemistry, Cell Biology, Molecular Biology, Neuroscience, Pharmacology, and Physiology). See Biological Chemistry for course description.

#### TOPICS IN MACROMOLECULAR STRUCTURE AND FUNCTION

**Course Type:** Other

**Department:** Biophysics & Biophysical Chemistry

**Course Director:** Dr. Bin Wu

**Telephone Number:** 410-502-4201

**Faculty:** Departmental faculty

**Availability/Duration:** One hour per week, second semester.

**Prerequisite(s):** None

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Seminar course covering a variety of topics involving the structure and function of proteins and nucleic acids.

#### FUNDAMENTALS OF PROTEIN CRYSTALLOGRAPHY

**Course Type:** Other

**Department:** Biophysics & Biophysical Chemistry

**Course Director:** Dr. L. Mario Amzel

**Telephone Number:** 410-955-3955

**Faculty:** Drs. L. Mario Amzel, S. Bailey, M. Bianchet, S. Gabelli, J. Kavran, , and C. Wolberger

**Availability/Duration:** Fourth quarter, two 75-minute lectures per week, alternates with “Advanced Topics in Protein Crystallography”; next offered in 2022.

**Prerequisite(s):** Calculus and elementary physics, or consent of instructor

**Drop Period:** 1 month

**Description:** An introductory course designed to present the core knowledge and theoretical underpinnings of protein crystallography necessary to function in the laboratory. Assigned readings and problem sets will be given.

### PROTEINS AND NUCLEIC ACIDS

**Course Type:** Other

**Department:** Biophysics & Biophysical Chemistry

**Course Director:** Dr. Sarah Woodson

**Telephone Number:** 410-516-2015

**Faculty:** Drs. G. Bowman and S. Woodson

**Availability/Duration:** Three hours per week; first semester

**Prerequisite(s):** See course director

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The structure of proteins, DNA and RNA and their functions in living systems. Students are required to participate in class discussions based on readings from primary scientific literature. Weekly problem sets include the analysis of molecular structures with Python and PyMOL scripts. Basic knowledge of UNIX and Python scripting required.

### PROTEINS AND NUCLEIC ACIDS II

**Course Type:** Other

**Department:** Biophysics & Biophysical Chemistry

**Course Director:** Dr. James E. Berger

**Telephone Number:** 410-955-7163

**Faculty:** Departmental Faculty

**Availability/Duration:** Three hours per week; second semester

**Prerequisite(s):** Nucleic Acids I

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Critical reading and analysis of primary source literature is vital to scientific discourse and discovery. Students will be responsible for analyzing and critiquing papers in diverse topics and systems ranging from replication, transcription, translation to enzyme mechanism, drug resistance, innate immunity and signaling, Methods covered will include structural, biochemical, single molecule, single cell, and genomic approaches. Students will deliver analytic presentations on at least two groundbreaking papers relevant to these areas and will be expected to actively participate in class discussion of experimental methodology and logic of other papers assigned in the course.

### ADVANCED TOPICS IN PROTEIN CRYSTALLOGRAPHY

**Course Type:** Other

**Department:** Biophysics & Biophysical Chemistry

**Course Director:** Departmental Faculty

**Telephone Number:** 410-955-3955

**Faculty:** Departmental faculty

**Availability/Duration:** Fourth quarter; alternates with "Fundamentals of Protein Crystallography" (interdivisional course); next offered in 2021.

**Prerequisite(s):** Elementary crystallography

**Drop Period:** 1 month

**Description:** In a journal club format this course examines standard advanced topics in crystallography as well as aspects of the current literature. Topics may include refinement, approaches to the phase problem, Fourier transform methods, etc.

### ANALYSIS OF MACROMOLECULES

(NOTE: Biophysics & Biophysical Chemistry and Macromolecular Structure and Function were merged)

**Course Type:** Biophysics & Biophysical Chemistry

**Course Director:** Dr. Dominique Frueh, [dfrueh@jhmi.edu](mailto:dfrueh@jhmi.edu)

Telephone Number: 410-614-4719

**Faculty:** Drs. Frueh, L.M. Amzel, S. Bailey, J.M. Berger, B. Cole, T. Ha, J. Kavran, A. Lau, J. Sohn, C. Wolberger, B. Wu, and N. Zachara

**Availability/Duration:** First quarter 6 hours per week

Prerequisite(s): None

**Drop period:** mid-point of the course

**Description:** The course will cover (1) macromolecules, (2) physical chemical principles dictating their biological behavior, and (3) methods to study them. Macromolecular interactions and functions are interpreted through a framework that combines theoretical concepts with experimental illustrations thereof. Key methods include: X-ray crystallography, nuclear magnetic resonance, cryo-electron microscopy, mass spectrometry, absorption and emission spectroscopies, hydrodynamic methods, and single-molecule approaches. Lectures will focus on practical applications of the methods, experimental design, data collection, and elementary aspects of data analyses.

### SINGLE-MOLECULE SINGLE-CELL BIOPHYSICS

Course Type: Other

**Department:** Biophysics & Biophysical Chemistry

Course Director: Dr. Taekjip Ha

**Contact Information:** Tammy Hubbe, 410 614 3279, [tammyhubbe@jhmi.edu](mailto:tammyhubbe@jhmi.edu)

**Faculty:** Drs. Taekjip Ha, Hue Xial, and Bin Wu

**Availability/Duration:** Students must follow JHUSOM quarter dates/ Limited to 15 students, next offered in 2022.

Prerequisite(s): None

Drop Period: 1 month

**Description:** This elective course offers an introduction to the field of single molecule and single cell biophysics to graduate students in Johns Hopkins University and will be delivered in the School of Medicine. We will examine technologies such as single molecule fluorescence and force measurements, super resolution imaging and single fluorescent detections that enable high precision molecular visualizations in vitro and in cells.

## CELL BIOLOGY

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ME:110.699

### THE CYTOSKELETON

**Course Type:** Basic Research

**Department:** Cell Biology

**Course Director:** Dr. Douglas Robinson

**Telephone Number:** 410-502-2850

**Faculty:** Dr. Douglas Robinson and staff

**Availability/Duration:** Fourth quarter; four weeks. Contact course instructor.

**Prerequisite(s):** 4<sup>th</sup> year college; 1<sup>st</sup> year grad level in cell biology, biochemistry, molecular biology

**Drop Period:** 1 month

#### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** In this course, we will explore the fundamental mechanisms of the cytoskeleton that the cell uses to drive cell motility and dynamic shape changes. We will emphasize the breadth of research on the cytoskeleton ranging from classic studies of muscle, cytoskeletal structure, enzymological, and single molecule studies of motor proteins, rheology, polymer dynamics, cytoskeletal signaling, the cytoskeleton in disease, and chemical approaches to the cytoskeleton. The course format will be a combination of lecture and student-led discussions of hallmark papers.

### DEVELOPMENTAL BIOLOGY

**Course Type:** Elective

**Department:** Cell Biology (Physiology, Molecular Biology and Genetics, Neuroscience, and Institute for Genetic Medicine)

**Course Director:** Dr. Deborah Andrew

**Telephone Number:** 443-287-4866

**Faculty:** Departmental Faculty

**Availability/Duration:** April 16-May 16; 11 lectures MWF; take home exam

**Prerequisite(s):** Molecular biology, cell biology, and genetics

**Drop Period:** 1 week

**Description:** A graduate-level course covering the molecular and cellular basis of embryonic development in multicellular organisms.

### NUCLEAR STRUCTURE AND HUMAN DISEASE

**Course Type:** Basic Research

**Department:** Cell Biology

**Course Director:** Dr. Katherine Wilson

**Telephone Number:** 410-955-1801

**Faculty:** Dr. Wilson and invited experts

**Availability/Duration:** Fourth quarter; four weeks

**Prerequisite(s):** 4<sup>th</sup> yr. college; 1<sup>st</sup> yr. grad level in cell biology, biochemistry, and molecular biology

**Drop Period:** 1 month

#### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** Structure and functions of the nuclear envelope (NE) including LINC complexes, the nucleoskeleton (lamins, actin/myosins, spetrin/4.1, tintin, NUMA), nuclear pore complexes and nucleocytoplasmic transport, subnuclear organelles, higher-order chromatic organization, signaling in the nucleus, evolution of the nucleus, and human "laminopathy" diseases including muscular dystrophy, lipodystrophy, and accelerated aging.

## RESEARCH OPPORTUNITIES

DR. DEBORAH ANDREW

Developmental genetics of organ formation; *Drosophila*

DR. PETER DEVREOTES

Chemoattractant directed cell migration; signal transduction

DR. PETER ESPENSHADE

Cellular regulation of cholesterol homeostasis and adaptation to hypoxia

DR. ANDREW EWALD

Cellular mechanisms and molecular regulation of epithelial morphogenesis in development and cancer

DR. LUIS ANDRES GARZA

The study of skin stem cells and prostaglandins in regeneration and wound healing.

DR. DAVID HACKAM

Immune regulation of injury and repair at epithelial surfaces

DR. PABLO IGLESIAS

Computational biology; use of control and information theory to study signal transduction pathways

DR. MIHO IJIMA

Lipid signaling in chemotaxis

DR. TAKANARI INOUE

Directed cell migration; tumor metastasis; primary cilia; synthetic chemical biology; technology development

DR. CARLO IOMINI

The role of primary cilia in corneal development and polycystic kidney disease.

DR. PHIL JORDAN

Gametogenesis (spermatogenesis and oogenesis) - Pluripotent stem cell genome maintenance - Neurodevelopment

DR. SCOT KUO

Mechanical functions of cells; actin-based protrusion and cell motility; nanoscale biophysics; laser-based imaging and bioinstrumentation

Dr. JIAN LIU

Theoretical modeling, mechanobiology, cell migration, membrane trafficking, cell division

DR. RONG LI

Cellular dynamics in space, time, and adaptation

DR. ERIKA MATUNIS

Molecular genetics of germ line stem cell function

DR. MICHAEL MATUNIS

Molecular mechanisms of SUMOylation and functions of mitosis; DNA repair, stress response pathways and *P. falciparum* development

DR. SUSAN MICHAELIS

Yeast and mammalian cell biology; progeria and lamin A processing; ER quality control and cystic fibrosis; ABC transporters

DR. DOUGLAS ROBINSON

Probing the molecular, biochemical, and mechanical basis for cytokinesis and cellular morphogenesis

DR. LEWIS H. ROMER

Cardiovascular, pulmonary diseases

DR. ANTHONY ROSEN

Autoimmune rheumatic diseases including Lupus, RA, Scleroderma, Myositis and Sjogren's Syndrome

DR. HIROMI SESAKI

Mitochondrial dynamics; membrane fusion and fission

DR. NILABH SHASTRI

Immune surveillance, exploring the molecular mechanisms behind T-cell activation

DR. SHIGEKI WATANBE

High-resolution, ultrafast kinetics of synaptic membrane trafficking events

DR. KATHERINE WILSON

The cell nucleus, nuclear membranes, lamins and nucleoskeleton; membranes of Emery-Dreifuss muscular dystrophy and other "laminopathies"

## DERMATOLOGY

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ME:220.699

We welcome students to take a Dermatology clerkship regardless of the medical discipline they intend to pursue. This should take place after completing multiple core clerkships including Medicine, Surgery and Pediatrics. We believe students should receive as broad exposure to medicine as possible before taking our introductory clerkship (Clinical Clerkship in Dermatology) and making career decisions. If further experience/learning is desired, we also suggest taking our Advanced Clinical Clerkship in Dermatology. For those students with a career interest in Dermatology, taking electives in related sub-specialties such as Rheumatology, Immunology, and Plastic Surgery are encouraged.

*Dr. Daren Simkin*  
*Assistant Professor, Department of Dermatology*  
*Assistant Residency Program Director*  
*Director of Medical Student Education*

*Medical Student Rotation Coordinator:*  
*Shanika Bennett*  
*Sbenne17@jhmi.edu*

### DERMATOLOGY CLINICAL CLERKSHIP

**Course Type:** Clinical Clerkship

**Department/Division:** Dermatology

**Course Director:** Dr. Daren Simkin

**Course Coordinator:** Shanika Bennet, sbenne17@jhmi.edu

**Faculty:** Full-time faculty

**In-person electives:** All year except Summer Quarter Period 2; one month; student maximum varies (no more than 4 per rotation); Please email your elective form to coordinator. All availability correspondence should be emailed to [sbenne17@jhmi.edu](mailto:sbenne17@jhmi.edu). Online electives open to 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> year medical students.

**Prerequisite(s):** Internal Medicine, Surgery, and Pediatrics (at least two out of three)

**Drop Period:** 2 months

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Students may apply towards the end of their 3<sup>rd</sup> year or in their 4<sup>th</sup> year of medical school for a clinical elective in Dermatology where the focus is placed on intensive exposure to a large number of patients in different clinical settings. Students will spend time exclusively at the Johns Hopkins facilities (Outpatient Center, Greenspring Station, and Harriet Lane Pediatrics Center). Our clinical services at these locations provide an excellent opportunity for students to interact with different types of patients and to be exposed to a wide range of skin problems. Parallel to the clinical activities, there are didactic sessions most Wednesday mornings and occasionally on other weekday mornings. Formal lectures on basic Dermatology topics are given by Dermatology residents and sessions at a more advanced level are taught by faculty members. No formal exam is given and grading is based on the evaluations submitted by residents and faculty members and a short oral presentation.

### DERMATOLOGY ADVANCED CLINICAL CLERKSHIP

**Course Type:** Clinical Clerkship

**Department/Division:** Dermatology

**Course Director:** Individual Dermatology Faculty

**Course Coordinator:** Shanika Bennet, sbenne17@jhmi.edu

**Availability/Duration:** All year; 1-3 months; depends on mentor availability

**Prerequisite(s):** Basic Dermatology elective (Clinical Clerkship in Dermatology); complete at least two of the following clerkships: Internal Medicine, Surgery and Pediatrics

**Drop Period:** 2 months

**Description:** Students who have already taken the Clinical Clerkship in Dermatology at Johns Hopkins and who are interested in a specific area of dermatology or in dermatology research may benefit from this elective. This elective gives the student the opportunity for more “in depth” participation in specific areas of interest within the department of Dermatology under guidance of a faculty mentor. Arrangements have to be made between the interested student and the faculty member who will be mentoring him/her prior to beginning the elective. The main objective is active participation in a small clinical research project, or clinical and scholarly work with a faculty member with a certain specialty focus. The faculty mentor will provide the specific schedule. Students are encouraged to participate in all didactic activities including Grand Rounds and faculty lectures during the time spent in the department.

### **BASIC DERMATOPATHOLOGY**

**Course Type:** Clinical Clerkship

**Department/Division:** Dermatology

**Course Director:** Dr. Janis Taube; Dr. Inbal Sander

**Course Coordinator:** Shanika Bennett, sbenne17@jhmi.edu

**Faculty:** Dr. Inbal Sander

**Availability/Duration:** All year; except Summer Quarter Period 2; 1 month; one student; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Internal Medicine, Surgery, Pediatrics, Pathology, and Clinical Clerkship in Dermatology at Johns Hopkins

**Drop Period:** 2 months

**Description:** Students may apply for an elective in dermatopathology if they have completed the prerequisites. Students will attend daily sign out where they will be exposed to a large volume of cases. Additional exposure will come through the use of study sets which are available to the students. The students will attend the Dermatology weekly Grand Rounds where they may see patients and participate in the discussion and presentation of the pathology for those patients. Additionally, the students will attend a formal dermatopathology teaching session once per week.

### **RESEARCH OPPORTUNITIES**

DR. CRYSTAL AGUH

Ethnic Skin Program and Fellowship

DR. ANNA CHIEN

Translational research in general dermatology; mechanism of skin aging; photobiology

DR. LUIS GARZA

Skin infection; skin inflammation, innate immunity, skin microbiome

DR. JUN KANG

Clinical and translational research in rheumatologic dermatology and in-patient consultative dermatology. AI and full body photography in dermatology.

DR. SEWON KANG

Translational research in dermatology

DR. SHAWN KWATRA

Translational research in itch; pruritus; atopic dermatitis; prurigo nodularis. Also, epidemiology/health service research using national data sets and retrospective cohort studies. Opportunities for literature reviews are also available.

DR. SIMA ROZATI

Translational research in cutaneous lymphoma, oncodermatology



DR. INBAL SANDER

Rheumatologic dermatology diseases, dermatopathology

DR. JEFFREY SCOTT

Dermatoepidemiology; Dermatologic surgery; Skin cancer

DR. DAREN SIMKIN

History of dermatology

DR. JANIS TAUBE

Melanoma; dermatopathology, image analysis

Dr. JOY WAN

Epidemiologic and clinical research investigations focused on pediatric dermatology; atopic dermatitis; psychosocial and life impact of chronic skin disease.

## EMERGENCY MEDICINE

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ME:520.699

### ADVANCED CLERKSHIP IN EMERGENCY MEDICINE

#### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship

**Department/Division:** Emergency Medicine

**Course Director:** Dr. Sharon Bord; 410-550-7852

**Telephone Number:** 410-955-5107; Ms. Pam McCann

**Faculty:** Dr. Bord and Emergency Medicine faculty

**Availability/Duration:** Students will divide their time between JHH and Bayview; visiting medical students must follow JHUSOM quarter dates.

**Prerequisite(s):** Core Clerkships in Surgery, Medicine & Emergency Medicine; Women's Medicine strongly recommended

**Drop Period:** 1 month

**Description:** The EM sub-internship will be following the Academic Calendar and policies as issued by the Johns Hopkins University School of Medicine. This may result in a shortened rotation with fewer clinical shifts than what was standard in the past.

Students in the third and fourth years who wish an in-depth experience in emergency medicine may serve as subinterns in the Adult Emergency Department. Further development of clinical reasoning/problem solving skills and selected procedural skills will be emphasized. Upon completion of this elective, students will demonstrate competency in the recognition and initial stabilization of life threats in trauma and non-trauma patients. Exposure to pre-hospital care can be made available. Sub-interns are required to attend departmental conferences. A formal case write-up, in the form of a Blog may be required.

Applicants limited to LCME-accredited schools only. Due to high demand we are not accepting international medical students for the Advanced Clerkship.

### ADVANCED CLINICAL ELECTIVE IN INPATIENT COVID-19 CARE

**Course Type:** Clinical Clerkship

**Department/Division:** Interdisciplinary

**Course Director:** Dr. Julianna Jung

**Telephone Number:** 443-802-6037

**Faculty:** COVID Service Faculty

**Availability/Duration:** M4 students

**Prerequisite(s):** Core Clerkship in Internal Medicine

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The COVID-19 pandemic is the single greatest public health crisis of our time and is a major defining force in medicine and in public life. As of 12/7/2020, medical students in advanced clerkships have been granted permission to participate in the care of patients with confirmed or suspected COVID-19, and many have demonstrated great interest in this opportunity. As COVID-19 incidence surges in our community, there is a genuine need for clinical work to which senior medical students are to be extremely qualified to contribute, and engagement in this work would provide them with significant educational value.

This course focuses on the clinical care of hospitalized COVID-19 patients across various acuity levels and is a full-time clinical rotation. During their time on the COVID wards, students will be paired with clinicians responsible for admitting new patients and will actively participate in initial assessment and development of diagnostic and management plans. Students will follow their admitted patients throughout their hospitalizations and will serve as a primary source of care continuity in a clinical setting that is reliant on short-term clinician labor provided by physicians who have been redeployed from other activities to aid in the COVID-19 response. Students will also be

trained as “Epic Superusers” so that they can take responsibility for order entry, documentation, and medication reconciliation for admitted patients. This will allow them to take meaningful ownership over patient care, while also providing redeployed clinicians with vital assistance, as many are unaccustomed to the inpatient Epic environment. While faculty preceptors may be redeployed from other services, all will be qualified clinicians and full-time faculty members or fellows and will receive specific training in how to work constructively with students and optimize their educational experience.

The clinical experience will be supplemented by online learning activities including case-based discussions and virtual simulation sessions. Peer education will be incorporated with the addition of a student-run journal club, in which students will present research data on novel therapies for COVID-19 in a faculty-moderated format. Assessment will be based primarily on clinical performance evaluations completed by faculty preceptors, with smaller contributions from journal club presentation scores and degree of engagement in learning activities.

**Course Objectives:** -Conduct a thorough assessment of a COVID-19 patient, including identification of factors that influence complication risk and overall prognosis  
-Manage longitudinal care for a COVID-19 patient, including order entry, documentation, medication reconciliation, consultation with other services, and patient/family communication  
-Describe an approach to the recognition and stabilization of acute complications common among COVID-19 patients  
-Discuss recent advances in the scientific foundations of COVID-19 care

### **EMERGENCY MEDICINE POINT-OF CARE ULTRASOUND ELECTIVE**

**Course Type:** Other

**Department/Division:** Emergency Medicine

**Course Director:** Randall T. Rhyne, MD and Tiffany Fong, MD

**Faculty:** Randall T. Rhyne, MD; [rrhyne@jhmi.edu](mailto:rrhyne@jhmi.edu) and Tiffany Fong, MD; [tfong3@jhmi.edu](mailto:tfong3@jhmi.edu)

**Contact:** [rrhyne@jhmi.edu](mailto:rrhyne@jhmi.edu); [tfong3@jhmi.edu](mailto:tfong3@jhmi.edu)

**Availability/Duration:** Two-week electives are offered at various times throughout the year. Please contact Dr. Rhyne or Dr. Fong directly to discuss elective availability prior to enrolling with the Registrar's Office. In your email, please include your planned career trajectory and goals, any specific interests in POCUS, and prior training in ultrasound.

**Prerequisite(s):** Emergency medicine clerkship

**Drop Period:** 1 month

**Description:** This course aims to develop the core knowledge base, bedside imaging acquisition/interpretation skills, and framework for clinical integration to allow students to begin using point-of-care ultrasound in patient care. This course builds on what you learned about point-of-care ultrasound in your Emergency Medicine clerkship. What you learn in this elective will prepare you to incorporate point-of-care ultrasound into the evaluation and management of patients in the clinical setting. Educational strategies utilized will include asynchronous readings and/or online modules, hands-on instruction in clinical ultrasonography in the Emergency Department, participation in image review/quality assurance sessions for direct feedback, and delivery of a presentation on a point-of-care ultrasound topic of your interest.

By the end of this elective, students will be able to:

1. Explain the clinical indications for point-of-care ultrasound in the ED setting
2. Demonstrate proficiency of ultrasound "knobology" including transducer selection, appropriate adjustment of gain, depth, labelling, and saving images/clips
3. Accurately perform image acquisition and interpretation of the basic and lifesaving emergency ultrasound applications relevant to student interest and future career including (but not limited to) EFAST, Cardiac, Thoracic, AAA, Biliary, Renal/Urinary Tract, and Ultrasound-guided vascular access
4. Demonstrate proficiency in using QpathE ultrasound management software
5. Demonstrate appropriate interpersonal communication skills in interactions with patients, family members, colleagues, and supervisors

### EMERGENCY MEDICINE RESEARCH

**Course Type:** Clinical Research

**Department/Division:** Emergency Medicine

**Course Director:** Dr. Richard Rothman and Dr. Jeremiah Hinson

**Faculty:** Drs. Richard Rothman; [rrothman@jhmi.edu](mailto:rrothman@jhmi.edu) and Jeremiah Hinson; [jeremiah.s.hinson@jhmi.edu](mailto:jeremiah.s.hinson@jhmi.edu)

**Contact:** Gideon Avornu, [gavornu1@jhmi.edu](mailto:gavornu1@jhmi.edu)

**Availability/Duration:** All during the year; for a minimum of 8 weeks; must be approved by the course director; visiting medical students must follow JHUSOM quarter dates.

**Prerequisite(s):** Prefer students with basic understanding and some experience in research. Must be highly motivated.

**Drop Period:** 2 months

**Description:** General research elective tailored to individual student interest and background. The student should expect some level of continuous participation beyond basic requirements to gain the maximum learning experience, including interest in writing and being part of a research team/program.

### EMERGENCY MEDICINE SUMMER RESEARCH

**Course Type:** Clinical Research

**Department/Division:** Emergency Medicine

**Course Director:** Dr. Gabor D. Kelen and Dr. Richard Rothman

**Contact:** Gideon Avornu, [gavornu1@jhmi.edu](mailto:gavornu1@jhmi.edu)

**Faculty:** Drs. Gabor D. Kelen, Richard Rothman and Jeremiah Hinson

**Availability/Duration:** 9 weeks in the summer; visiting medical students must follow JHUSOM quarter dates.

**Prerequisite(s):** Prefer students with some research experience. Only highly motivated and engaged students should apply.

**Drop Period:** 2 months

**Description:** Special summer research program teaches the fundamentals of clinical research from idea to study to analysis to medical writing. Program is only offered in certain years based on research priorities of the department and level of engagement of a student research group.

### EQUITABLE HEALTHCARE- A VIRTUAL CLINICAL ELECTIVE IN EMERGENCY MEDICINE

**Course Type:** Other

**Department/Division:** Emergency Medicine

**Course Director:** Dr. Sharon Bord, [sbord1@jhmi.edu](mailto:sbord1@jhmi.edu), and Dr. Kamna Balhara, [kbalhar1@jhmi.edu](mailto:kbalhar1@jhmi.edu)

**Course Coordinator:** Pamela McCann, [pmcann3@jhmi.edu](mailto:pmcann3@jhmi.edu)

**Availability/Duration:** 2-week elective; Capacity- 10 learners; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** N/A

### **ENROLLMENT LIMITED TO VISITING MEDICAL STUDENTS.**

**Description:** This course is a 2-week virtual clinical experience for students to engage in clinical and learning opportunities in the field of Emergency Medicine. It is designed for students who have already completed an internal medicine core clerkship and plan to apply into an Emergency Medicine residency. The course will consist of a shared, universal curriculum that will cover topics such as health disparities, global health, LGBTQIA+ health, telemedicine, palliative care, and community resources in Baltimore. The specialty-specific curriculum will explore equitable healthcare within Emergency Medicine through patient interviews, case presentations, departmental conferences, didactics, and team discussion, allowing students to refine their skills while networking with residents and faculty.

### COMBINED SUBINTERNSHIP IN EMERGENCY MEDICINE AND ANESTHESIOLOGY

**Course Type:** Subinternship

**Department/Division:** Emergency Medicine and Anesthesiology and Critical Care Medicine

**Course Director:** ACCM: Tina Tran, MD, Jed Wolpaw, MD

EMed: Sharon Bord, MD Amelia Pousson, MD Julianna Jung, MD  
**Contact:** ACCM: Tina Tran, ttran32@jhmi.edu - clerkship co-director  
Jed Wolpaw, jwolpaw@jhmi.edu - clerkship co-director  
Emily Jensen, ejense11@jhmi.edu - sr. administrative coordinator  
Priyanka Dwivedi, pdwived1@jhmi.edu - medical training program manager

EMed: Sharon Bord, sbord1@jhmi.edu, Course Director  
Amelia Pousson, apouso1@jhmi.edu, Course Associate Director  
Jules Jung, jjung@jhmi.edu, Course Associate Director  
Pam McCann, pmccann3@jhmi.edu, Course Coordinator

**Faculty:** Anesthesiology and Emergency Medicine Faculty

**Availability/Duration:** 3 weeks

**Prerequisite(s):** prior Anesthesiology clerkship, prior Emergency Medicine clerkship, evidence of observership, letter of intent/interest by medical students

**Drop Period:** 1 month

**Description:** The combined EM/ACCM Advanced Clerkship will provide students with the opportunity to rotate and have clinical experiences in both departments. The fields of EM and anesthesiology have significant overlap in terms of airway management and management of critically ill patients in the ED, OR and ICU settings. This clinical rotation will highlight some of the overlap between these specialties as well as their unique aspects and will help prepare students for the combined EM/Anesthesia residency program.

EMed:

This course is about key concepts in the assessment, management, and disposition of patients in the Emergency Department. It builds on what you learned in your prior rotation in Emergency Medicine, allowing you to apply those concepts by serving as the primary provider for acutely ill and injured patients in the ED. What you learn in this clerkship will prepare you not only to evaluate and manage patients in the ED setting, but also to address acute concerns that arise in the care of hospitalized and ambulatory patients. The course primarily focuses on supervised clinical practice, though you will also complete an academic writing exercise, and participate in didactics and Residency Conference.

Overall Course/Clerkship Objectives

By the end of this clerkship, all students will be able to:

1. Perform a focused history and physical examination based on an emergent chief complaint.
2. Present clinical findings, assessment, and plan in an organized and cohesive fashion.
3. Describe the differential diagnosis, evaluation, and management of common ED presentations including but not limited to: Chest pain, Vaginal bleeding or discharge, Shortness of breath, GI bleeding, Headache, Hyperglycemia, Abdominal pain, Fever, Altered mental status, Seizure, Minor trauma, Acute weakness, Syncope.
4. Interpret common emergency diagnostic tests, including laboratory studies, electrocardiograms, plain films, and CT scans.
5. Manage all aspects of care for assigned patients in the ED, including ordering tests and treatments, communicating with consultants and care team, and planning for disposition.
6. Demonstrate appropriate interpersonal communication skills in interactions with patients, family members, colleagues, and supervisors
7. Describe and/or demonstrate a basic approach to the following procedures when encountered in clinical practice: ABG, IV placement, Central line placement, Lumbar puncture, Endotracheal intubation, Nasogastric tube placement, CPR, Decompression of pneumothorax, Pericardiocentesis, Laceration repair, Medical resuscitation, Trauma resuscitation
8. Participate as a member of the critical care resuscitation team for seriously ill and injured patients.

ACCM:

During the Anesthesiology clerkship, students work directly with a senior anesthesia resident in ORs and procedural suites throughout the hospital to provide general anesthesia and monitored anesthesia care to a wide variety of patients.

Students are active participants in patient care and will perform important life-saving skills including: face mask ventilation, intravenous catheter placement, airway device insertion and management (laryngeal mask airway placement endotracheal intubation), IV medication administration, interpretation of vital signs, hemodynamic changes, and imaging studies. Students may perform or assist with advanced skills such as fiberoptic intubations, arterial line placement central line placement, epidural catheter placement, and ultrasound guided procedures. The skills acquired during the clerkship in anesthesiology are broadly applicable to a wide variety of fields and are particularly useful in rapid response and code situations. Students are active participants in comprehensive perioperative care from conducting the preoperative evaluation prior to induction, to performing procedures and management during and after induction, to signing out to the PACU/ICU team postoperatively. Students receive one-on-one teaching in the operating room from anesthesia residents and attendings who are engaged, active teachers and who view students as integral members of the team. Students learn about physiology and pharmacology in real-time by administering medications and other interventions and observing the changes in hemodynamics. Students are assigned with the overnight call team to give them exposure to emergency cases, traumas, codes, and other types of cases may not occur during the day. Simulation sessions and didactics augment the intraoperative learning experience during the rotation. A case discussion session at the conclusion of the clerkship will include a discussion of fundamental anesthesia concepts and presentation of a medically challenging clinical case. Many students have gone on to present their clinical cases at national and international scientific meetings.

Objectives are cumulative and students will continue to practice and build on clinical skills as the clerkship progresses.

By the end of Week 1, students will:

1. Perform a comprehensive airway anatomy exam prior to induction of anesthesia
2. Assist in the pre-operative OR preparation, including IV set up, airway equipment, medications, and anesthesiology machine and monitor check
3. Perform mask ventilation skills including insertion of airway adjunct devices
4. Learn direct laryngoscopy and LMA placement techniques
5. Learn peripheral IV placement techniques with and without ultrasound guidance
6. Classify patient's health status and medical co-morbidities based on ASA status
7. Understand and research the pharmacology of different medications used for induction, maintenance, and emergence from anesthesia.
8. Perform focused pre-anesthesia assessments and physical exams
9. Attempt arterial line placement and other advanced techniques
10. Interpret intra-operative monitors
11. Develop a perioperative plan for patient management

By the end of week 2, students will:

1. Name criteria for extubation, both clinical and subjective considerations
2. Explain the concept of MAC, particularly how it varies in different patients
3. Identify co-morbidities that may affect anesthetic management
4. Discuss the components of the ASA difficult airway algorithm
5. Perform advanced airway techniques, such as video laryngoscopy
6. Show proficiency and independence in mask ventilation and IV insertion techniques
7. Provide detailed clinical sign out or handoff reports to PACU/ICU teams
8. Independently prepare an OR for the start of a case (including medications, airway equipment, suctioning, IV tubing, etc.)
9. Interpret hemodynamic changes and provide interventions during intraoperative management

## RESEARCH OPPORTUNITIES

CHRISTINA CATLETT, M.D.

Health system emergency preparedness and response; disaster education and training; expedition medicine

ARJUN CHANMUGAM, M.D., M.B.A.

Psychiatric emergencies

BHAKTI HANSOTI, M.D.

International emergency medicine research.

YU-HSIANG HSIEH, M.Sc., Ph.D.

Infectious diseases epidemiology in ED settings

EDBERT HSU, M.D., M.P.H.

Disaster preparedness and disaster training; pharmaceutical preparedness

JULIANNA JUNG, M.D., M.Ed.

Simulation in medical education

GABOR KELEN, M.D.

Research methodology and design; HIV and infectious disease prevalence; health services; acute care outcomes; disaster medicine

SCOTT LEVIN, Ph.D.

Systems engineering in healthcare; research design and methods; patient safety; health services

MATTHEW LEVY, D.O. M.Sc.

Emergency medical services research.

MICHAEL MILLIN, M.D., M.P.H.

EMS systems development; out-of-hospital cardiovascular resuscitation; wilderness medicine; emergency preparedness

JUNAID RAZZAK, M.D.

International emergency medicine research.

RICHARD ROTHMAN, M.D., Ph.D.

Complications of drug abuse; health services research; infectious diseases and rapid diagnostics

NELSON TANG, M.D.

Emergency Medical Services; operational emergency medicine; tactical medicine; law enforcement medical support; special event medical preparedness

## FAMILY MEDICINE

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### CLINICAL CLERKSHIP IN FAMILY MEDICINE –FRANKLIN SQUARE HOSPITAL

**Course Type:** Clinical Clerkship

**Department/Division:** Department of Family Medicine at Franklin Square Hospital

**Course Director:** Dr. Nancy Barr

**Telephone Number:** Contact Kathy Whelan at 443-777-6544 or [kathy.whelan@medstar.net](mailto:kathy.whelan@medstar.net)

**Faculty:** Dr. Barr and associates

**Availability/Duration:** All year (based upon availability); 4 weeks

**Prerequisite(s):** Any student interested in a career in family medicine/primary care. Fourth year students applying to family medicine with an interest in the residency program are also welcome.

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This four-week rotation introduces students to the wide scope of practice inherent to family medicine. Students are given an opportunity to see patients in the Family Health Center clinic. Additional clinical opportunities include home visits. Students participate in daily morning reports and weekly didactic sessions. Student also have the opportunity to work with an electronic health record while improving their clinical note writing skills.

### ELECTIVE IN PRIMARY CARE

See Internal Medicine

### FAMILY PRACTICE AMBULATORY CLERKSHIP

**Course Type:** Clinical Clerkship

**Department/Division:** Family Practice

**Course Director:** Dr. Terry Ruhl

**Contact:** Cindy Fickes, [fickescj@upmc.edu](mailto:fickescj@upmc.edu) or 814-889-2020

**Faculty:** Board certified members of the Altoona Family Physicians Residency Program

**Availability/Duration:** All year; 4-6 weeks

**Prerequisite(s):** Completion of the second-year coursework, affiliation agreement, clearances, PPD, transportation

**Drop Period:** At least 1 month preferably more since housing arrangements are provided

**Description:** This elective offers the student experience in a busy family practice setting in either the Altoona Family Physicians Residency Program in Altoona, PA or in a rural setting in Williamsburg, PA. Students will manage outpatients under the supervision of the family medicine faculty and residents. Both sites provide an insight into the different roles of the family practice physician in the community. [www.altoonafp.org](http://www.altoonafp.org)

Under the guidance of a faculty preceptor, each student will be given the opportunity to experience the many educational aspects of the practice, including office practice management and utilization of computer technology. Individual conferences are arranged with members of the practice. Housing and meals are provided. See additional information in the Office of Student Affairs.

### SENIOR OUTPATIENT ELECTIVE IN FAMILY MEDICINE – YORK HOSPITAL FAMILY MEDICINE RESIDENCY PROGRAM

**Course Type:** Subinternship

**Department/Division:** Family Medicine

**Course Director:** Dr. Stacey Robert

**Telephone Number:** Alexander Zeigler; 717-851-2753;

**Faculty:** Dr. Mark Goedecker

**Availability/Duration:** All year; one student per rotation; contact Alexandra Zeigler (see above)

**Prerequisite(s):** Completion of all required third year clerkships

**Drop Period:** 2 months



**Description:** This fourth-year elective in outpatient family medicine is a great educational experience which highlights many aspects of family medicine. Students have the choice of participating in various experiences including having their own patients at the Thomas Hart Family Practice Center (the outpatient offices of the residency), providing care in the Health Connect Van (a mobile unit that provides outreach care), nursing home care, private office family medicine, and other experiences. York Hospital is located in York County, Pennsylvania. York County has a diverse population of approximately 380,000 people. The Family Medicine Residency Program in York was one of the original family medicine programs in the country. Teaching opportunities include Morning Report, Grand Rounds, and Thursday morning conferences. Family medicine inpatient electives are also available. The Thomas Hart Family Practice Center has been using an electronic health record since 2006.

The hospital provides free parking in a restricted lot and free shared room and bath. Housing is adjacent to the hospital and includes a washer, dryer, refrigerator, computer access, linens, stove/oven, microwave, television, telephone, and exercise equipment.

Goals: 1) To function as a teaching model for medical students in the outpatient care of family medicine; 2) to demonstrate the full breadth of outpatient family medicine to students including care of infants, children, adults, women who are pregnant, and the elderly as well as various outpatient procedures; 3) to augment students' skills, knowledge, and attitudes in caring for ambulatory patients while preparing the students for a future career in family medicine.

Responsibilities: The main student responsibilities will be to participate in the outpatient care of patients. The majority of students' time will be spent at the Thomas Hart Family Practice Center where the student will have a daily schedule of patients. The student will be responsible for obtaining appropriate focused histories, performing a focused physical exam, presenting patients to a family medicine attending physician, performing any necessary procedures with attending physician supervision, and completing all appropriate paperwork including SOAP notes in the electronic health record, prescriptions, referrals, lab slips, and billing sheets.

Hours: 7 a.m. to 5 p.m. weekdays; no call on outpatient-only rotations

## GYNECOLOGY AND OBSTETRICS

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### GYNECOLOGIC ONCOLOGY RESEARCH

**Course Type:** Basic or Clinical Research

**Department/Division:** Gynecology and Obstetrics/ Gynecologic Oncology

**Course Director:** Dr. Amanda Fader

**Telephone Number:** 410-955-8240

**Faculty:** Dr. Fader and attending faculty

**Availability/Duration:** All year; offered as a 3- or 4-week elective

**Prerequisite(s):** Agreement with faculty mentor regarding research plan

**Drop Period:** 1 month

**Description:** Research projects on malignancies of the reproductive tract

### PELVIC MEDICINE AND RECONSTRUCTIVE SURGERY (UROGYN) RESEARCH

**Course Type:** Basic or Clinical Research

**Department/Division:** Gynecology and Obstetrics/ Urogynecology

**Course Director:** Dr. Grace Chen

**Telephone Number:** 410-550-2787

**Faculty:** Dr. Grace Chen and attending faculty

**Availability/Duration:** All year; offered as a 4- or 8-week elective

**Prerequisite(s):** Agreement with faculty mentor regarding research plan

**Drop Period:** 1 month

**Description:** Research projects including, but not limited to pelvic pain, bladder pain, pelvic reconstruction, urinary and fecal incontinence, pelvic trauma, obstetric fistula, and surgical skills assessment/surgical education.

### MATERNAL FETAL MEDICINE RESEARCH

**Course Type:** Basic or Clinical Research

**Department/Division:** Gynecology and Obstetrics/ Maternal Fetal Medicine

**Course Director:** Dr. Karin Blakemore

**Telephone Number:** 410-955-8496

**Faculty:** Dr. Karin Blakemore and attending faculty

**Availability/Duration:** All year; 3- or 4-week elective

**Prerequisite(s):** Agreement with faculty mentor regarding research plan

**Drop Period:** 1 month

**Description:** Research projects on perinatal genetics, high risk obstetrics, and prenatal diagnosis.

### REPRODUCTIVE ENDOCRINOLOGY RESEARCH

**Course Type:** Basic Research

**Department/Division:** Gynecology and Obstetrics/ Reproductive Sciences

**Course Director:** Dr. James Segars

**Telephone Number:** 410-583-2761

**Faculty:** Attending

**Availability/Duration:** All year; 3- or 4-week elective

**Prerequisite(s):** Agreement with faculty mentor regarding research plan

**Drop Period:** 1 month

**Description:** Research on topics related to reproduction, infertility, and embryology, includes but not limited to ovulation, IVF, pre-implantation genetics and embryology.

## GYNECOLOGIC PATHOLOGY

**Course Type:** Clinical Research  
**Department/Division:** Gynecology and Obstetrics  
**Course Director:** Dr. Russel Vang  
**Telephone Number:** 410-955-0471  
**Faculty:** Staff of the Division of Gynecologic Pathology  
**Availability/Duration:** All year; offered as a 3- or 4-week elective  
**Prerequisite(s):** Consent of instructor  
**Drop Period:** 1 month

**Description:** Consideration is given to the gross and histologic pathology of lesions of the reproductive tract, with opportunity for special investigative work in areas such as papilloma virus, tumors of the female genital tract, and gestational trophoblastic disease.

## FAMILY PLANNING AND REPRODUCTIVE CHOICE ELECTIVE

**Course Type:** Elective  
**Department/Division:** Gynecology and Obstetrics  
**Course Director:** Dr. Jennifer Robinson  
**Telephone Number:** 410-550-8498  
**Faculty:** Staff of the Division of Family Planning  
**Availability/Duration:** Preference for Summer Session III; possibly could be offered during other times of the year as basic Women's Health Clerkship schedules will allow; offered as a 3- or 4-week elective  
**Prerequisite(s):** Core Clerkship in Ob/Gyn  
**Drop Period:** 1 month

**Description:** In this clinical experience the student will function as a house officer at the first level on the family planning service. Students will participate in contraceptive and pregnancy options counseling. Students will be exposed to a breadth of family planning procedures including IUD insertion, contraceptive implant placement/removal, sterilization, and both medical and surgical abortion. A research component is encouraged.

## SUBINTERNSHIP IN GYNECOLOGY

### *APPROVED SUB-I EXPERIENCE*

**Course Type:** Subinternship  
**Department/Division:** Gynecology and Obstetrics  
**Course Director:** Dr. Silka Patel and Dr. Karen Wang  
**Contact:** Rebecca Slattery: 410-614-0088, [rslatte1@jhmi.edu](mailto:rslatte1@jhmi.edu),  
**Faculty:** Staff of the Division of Gynecology  
**Availability/Duration:** Preference for Summer Session III; possibly could be offered during other times of the year as basic Women's Health Clerkship schedules will allow; may be arranged for 3 or 4 weeks.  
**Prerequisite(s):** Core Clerkship in Women's Health and an interview  
**Drop Period:** 1 month

**Description:** This clinical experience consists of a subinternship in gynecology. The student will function as a house officer at the first-year level. In this capacity, the student will be responsible for the provision of inpatient and outpatient care to the patients who present to the respective services for care.

## HIV INFECTION IN WOMEN ELECTIVE

**Course Type:** Elective  
**Department/Division:** Gynecology and Obstetrics  
**Course Director:** TBA contact Dr. Patel  
**Contact:** Rebecca Slattery: 410-614-0088, [rslatte1@jhmi.edu](mailto:rslatte1@jhmi.edu),  
**Faculty:** attending faculty  
**Availability/Duration:** May be taken for 3 or 4 weeks.

**Prerequisite(s):** Core Clerkship in Ob/Gyn and an interview

**Drop Period:** 1 month

**Description:** Students will participate in the obstetric and gynecological care of HIV-positive women. A research component is encouraged.

### OBSTETRICS AND GYNECOLOGY ATBAYVIEW MEDICAL CENTER SUBINTERNSHIP

#### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship

**Department/Division:** Gynecology and Obstetrics

**Course Director:** Dr. Silka Patel

**Contact:** Rebecca Slattery: 410-614-0088, [rslatte1@jhmi.edu](mailto:rslatte1@jhmi.edu),

**Faculty:** Departmental Staff

**Availability/Duration:** Preference for Summer Session III; possibly could be offered during other times of the year as basic Women's Health Clerkship schedules will allow; 3 or 4 weeks

**Prerequisite(s):** Passing grade in basic core rotation in Ob/GYN.

**Drop Period:** 2 months

**Description:** This clinical experience consists of a subinternship in General Obstetrics and Gynecology. The student will function as an intern with responsibility for both inpatient and outpatient care. The emphasis will be on management of common OB/GYN problems.

### REPRODUCTIVE ENDOCRINOLOGY ELECTIVE

**Course Type:** Subinternship

**Department/Division:** Gynecology and Obstetrics

**Course Director:** Dr. Mindy Christianson

**Contact:** Rebecca Slattery, [rslatte1@jhmi.edu](mailto:rslatte1@jhmi.edu)

**Telephone Number:** 410-614-0088

**Faculty:** Staff of the Division of Reproductive Endocrinology

**Availability/Duration:** Preference for Summer Session III; possibly could be offered during other times of the year as basic Women's Health Clerkship schedules will allow; may be taken for 3 or 4 weeks

**Prerequisite(s):** Core Clerkship in Ob/Gyn

**Drop Period:** 2 months

**Description:** In this clinical experience the student will function as a house officer at the first-year level on the reproductive endocrinology service. The student will be responsible for providing inpatient and outpatient care to the patients who present to the respective services for care. A research component is encouraged.

### SUBINTERNSHIP IN GYNECOLOGIC ONCOLOGY

#### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship

**Department/Division:** Gynecology and Obstetrics

**Course Director:** Dr. Silka Patel

**Contact:** Rebecca Slattery: 410-614-0088, [rslatte1@jhmi.edu](mailto:rslatte1@jhmi.edu),

**Faculty:** Staff of the Division of Gynecologic Oncology

**Availability/Duration:** JHU SOM students accepted year-round, Visiting Medical students may apply all year. JHU SOM students have preference in summer period 3.

**Prerequisite(s):** Core Clerkship in Ob/Gyn

**Drop Period:** 2 months

**Description:** In this clinical experience the student will function as a house officer at the first-year level on the gynecologic oncology service. The student will be responsible for providing inpatient and outpatient care to the patients who present to the service for care.

## SUBINTERNSHIP IN OBSTETRICS/MATERNAL FETAL MEDICINE

### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship

**Department/Division:** Gynecology and Obstetrics

**Course Director:** Dr. Silka Patel

**Contact:** Rebecca Slattery: 410-614-0088, [rslatte1@jhmi.edu](mailto:rslatte1@jhmi.edu),

**Faculty:** Staff of the Division of Obstetrics

**Availability/Duration:** Preference for Summer Session III; possibly could be offered during other times of the year as basic Women's Health Clerkship schedules will allow; 3 or 4 weeks

**Prerequisite(s):** Core Clerkship in Ob/Gyn

**Drop Period:** 2 months

**Description:** This clinical experience consists of a subinternship in obstetrics. The student will function as a house officer at the first-year level and will be responsible for the provision of both inpatient and outpatient care to the patients who present to the respective services for care. A portion of each week can be spent in prenatal genetics, obstetrical sonography, and fetal assessment.

## VIRTUAL PATIENT INTERACTIVITY: PATIENT CASE-BASED EDUCATION IN UROGYNECOLOGY

**Course Type:** Other

**Department/Division:** Gynecology and Obstetrics/ Female Pelvic Medicine and Reconstructive Surgery

**Course Director:** Dr. Chi Chiung Grace Chen, [cchen127@jhmi.edu](mailto:cchen127@jhmi.edu) and Dr. Danielle Patterson, [dpatte33@jhmi.edu](mailto:dpatte33@jhmi.edu)

**Course Coordinator:** Carol Wilkinson, [cwilkin1@jhmi.edu](mailto:cwilkin1@jhmi.edu)

**Faculty:** Dr. Chi Chiung Grace Chen, Dr. Danielle Patterson, and Urogynecology fellows

**Availability/Duration:** 3-week elective; Next Course Offering to be determined.

**Prerequisite(s):** Transition to the Wards

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course was developed to provide a virtually interactive introduction to the subspecialty of female pelvic medicine and reconstructive surgery/ urogynecology. In this course, students will learn about the most common conditions seen in the urogynecology clinic. While this course will build on skills students learned during the Transitions to the Wards (TTW) course and other core clerkships including obstetrics and gynecology, previous rotation on any of the clinical clerkships, including obstetrics and gynecology, is not a prerequisite to taking this elective. The course combines the following elements:

- 1) Required readings mostly from the American College of Obstetrics and Gynecology (ACOG) practice bulletins
- 2) Online interactive new patient case reviews with instructions on written notes for virtual debriefing with faculty
- 3) Electronic medical review of select past patients on EPIC and case presentation on these patients virtually to faculty
- 4) PowerPoint presentation on urogynecologic topic of interest
- 5) Additional in-depth readings and reviewing of surgical videos with the opportunity to virtually discuss with faculty (optional)
- 6) Research in urogynecology topic of interest (optional)

## EQUITABLE HEALTHCARE- A VIRTUAL CLINICAL ELECTIVE IN GYNECOLOGY & OBSTETRICS

**Course Type:** Other

**Department/Division:** Gynecology & Obstetrics

**Course Director:** Dr. Torre L. Halscott, [thalsco1@jhmi.edu](mailto:thalsco1@jhmi.edu)

**Availability/Duration:** 2-week elective; Capacity- 5 learners

**Prerequisite(s):** Completion of Obstetrics and Gynecology or Women's Health Core clerkship

**Drop Period:** N/A

## ENROLLMENT LIMITED TO VISITING MEDICAL STUDENTS.

**Description:** This course is a 2-week virtual clinical experience for students to engage in clinical and learning opportunities in the field of Gynecology & Obstetrics. It is designed for students who have already completed a surgery core clerkship and plan to apply into a Gynecology & Obstetrics residency. The course will consist of a shared, universal curriculum that will cover topics such as health disparities, global health, LGBTQIA+ health, telemedicine, palliative care, and community resources in Baltimore. The specialty-specific curriculum will explore equitable healthcare within Gynecology & Obstetrics through patient interviews, case presentations, departmental conferences, didactics, and team discussion, allowing students to refine their skills while networking with residents and faculty.

### RESEARCH OPPORTUNITIES

DR. ABIMBOLA AINA  
Maternal and fetal medicine

DR. JEAN ANDERSON  
Obstetrics/Gynecology Infectious Diseases; HIV

DR. CYNTHIA ARGANI  
Maternal and fetal medicine

DR. JESSICA BIENSTOCK  
Maternal-fetal medicine; research in educational techniques

DR. KARIN BLAKEMORE  
Maternal and fetal medicine; prenatal genetics

DR. IRINA BURD  
Maternal and fetal medicine

DR. ANNE BURKE  
Contraception; family planning

DR. GRACE CHEN  
Obstetric fistula; surgical education; surgical skills assessment

DR. BETTY CHOU  
Cervical dysplasia; HPV vaccine; medical education

DR. JENELLE COLEMAN  
Gynecology

DR. AMANDA FADER  
Gyn Oncology

DR. JAIRO GARCIA  
Reproductive endocrinology; in vitro fertilization

DR. ERNEST GRAHAM  
Maternal and fetal medicine

DR. VICTORIA HANDA  
Urogynecology

DR. JANICE HENDERSON  
Maternal and fetal medicine

DR. NANCY HUEPPCHEN  
Maternal and fetal medicine; medical education

DR. SHARI LAWSON  
Ambulatory practice; medical student/resident education

DR. LORRAINE MILIO  
Maternal and fetal health

DR. DONNA NEALE  
Maternal and fetal medicine

DR. SILKA PATEL  
General obstetrics and gynecology, medical education

DR. ANDREW SATIN  
Medical simulation

DR. WEN SHEN  
General gynecology; menopause; cervical dysplasia; abnormal uterine bleeding

DR. CORNELIA TRIMBLE  
Gynecologic pathology; special clinical-pathologic projects; therapeutic HPV vaccines; cervical dysplasia

DR. FRANK WITTER  
Maternal and fetal medicine

DR. HOWARD ZACUR  
Reproductive endocrinology

DR. MOSTAFA BORAHAY  
Uterine Fibroid; Minimally Invasive Gynecologic Surgery

## HEALTH SCIENCES INFORMATICS

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ME:600.699

### HEALTH SCIENCES INFORMATICS ELECTIVE

**Course Type:** Other

**Department/Division:** Health Sciences Informatics

**Course Director:** Dr. Harold Lehmann

**Telephone Number:** 410-502-3768; [kwinnny@jhmi.edu](mailto:kwinnny@jhmi.edu); Ms. Kersti Winny

**Faculty:** Various faculty members

**Availability/Duration:** September to June, 1 to 2 months

**Prerequisite(s):** Course director's permission

**Drop Period:** 1 month

**Description:** Attached to the Health Sciences Informatics Research Training Program, this elective provides students with basic informatics research skills and knowledge, focused on health sciences applications, data, information, and knowledge, decision support, evaluation, security. Students participate in program meetings and seminars, conduct self-study, spend time at information technology settings (permission pending), and are responsible for a project report at the end of the elective. The report may range from a literature review to a system specification, to working code, depending on the interests and skills of the student.

### UNSTRUCTURED DATA MINING TO ADDRESS NOVEL INFECTIOUS DISEASES

**Course Type:** Other

**Department/Division:** Health Sciences Informatics

**Course Director:** Dr. Ashwini Davison, [ashdavison@jhmi.edu](mailto:ashdavison@jhmi.edu), Dr. Stuart Ray, [sray@jhmi.edu](mailto:sray@jhmi.edu), Dr. Paul Nagy, [pnagy2@jhmi.edu](mailto:pnagy2@jhmi.edu)

**Faculty:** Dr. Ashwini Davison, Dr. Stuart Ray, Dr. Paul Nagy, and Dr. Brian Garibaldi

**Availability/Duration:** 2-, 3-, or 4-week elective based on agreement with course director. Course can begin on/after 4/27/20.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This research elective is intended for medical students with an interest in the applications of natural language processing (NLP) techniques in addressing novel infectious disease outbreaks. During the era of big data in healthcare, there has been no greater catalyst for the importance of health informatics than the COVID-19 global pandemic. Students who are eager to derive insights from unstructured clinical data that can be used to better inform clinical decision making, contact tracing, containment and mitigation efforts will benefit from this opportunity. Faculty with expertise in pulmonology, infectious disease, radiological imaging, and clinical informatics will introduce students to the newly established COVID-19 Clinical Registry. Students will have an opportunity to perform chart abstraction and unstructured data annotation. They will work alongside clinical researchers, data analysts, and text mining experts to gain experience in the real-world application of creating supervised training sets for machine learning algorithms.

**Course Objectives:** -Describe at least 3 different techniques to standardizing data collection from chart extraction from unstructured clinical data

-Learn how to use the electronic data capture system Redcap and the natural clinical corpus tool Pine.

-Perform chart abstraction and annotation of free text data from electronic health records.

-Develop curated datasets for natural language processing



## HISTORY OF MEDICINE

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### DIRECTED READINGS

**Course Type:** Other

**Department/Division:** History of Medicine

**Course Director:** Faculty

**Telephone Number:** 410-955-3178

**Faculty:** Faculty

**Description:** On any subject in the history of medicine by arrangement with faculty.

**Availability/Duration:** TBA; visiting medical students must follow JHUSOM quarter dates.

**Prerequisite(s):** None

**Drop Period:** TBA

### MEDICAL HUMANITIES AND SOCIAL MEDICINE

**Course Type:** Research Elective

**Department/Division:** History of Medicine

**Course Director:** Drs. Joseph Carrese, Gail Geller, Jeremy Greene, Graham Mooney and Carolyn Sufrin

**Contact:** Carolyn Sufrin; [csufrin1@jhmi.edu](mailto:csufrin1@jhmi.edu)

**Faculty:** Drs. Joseph Carrese, Gail Geller, Jeremy Greene, Graham Mooney and Carolyn Sufrin

**Availability/Duration:**

**Prerequisite(s):** None

**Drop Period:**

**Description:** This elective course is designed for medical students in their clinical years seeking deeper engagement with the relationship between and its social contexts, and who want to develop or advance their own research projects on a topic of their interest in social medicine or medical humanities. "Social Medicine," for this course will be broadly defined and may include any number of themes-such as the production of health inequalities, racial justice in medicine, structural competency, and the application of social determinants of health-drawn from social science fields including anthropology, social, and history. "Medical Humanities" is similarly interdisciplinary and may include intersections with history, philosophy, literature, visual and musical arts, or religion. Participants in the course will pursue mentored research coupled with a series of core meetings with peers and faculty to discuss key concepts and current research in the medical humanities and social sciences, reflect on their applications to their developing clinical practice, and to workshop their own scholarly projects. By the end of the course, students can expect to have been introduced to various methods for examining the relationship between medicine and society, and to have made significant progress toward developing their own project as a publishable and/or actionable work.

### RESEARCH OPPORTUNITIES

DR. NATHANIEL COMFORT

History of biology, especially genetics; molecular biology and biomedicine; history of recent science; oral history; genomics

DR. MARY FISSELL

Anglo-American health care and popular medicine, 17th and 18th centuries; early modern gender, sex, and the body

DR. JEREMY A. GREENE

History of disease; history of therapeutics; medical technology; biomedical communications; medical anthropology

DR. GRAHAM MOONEY

History of public health; infectious diseases; historical geographies of health and medicine; epidemiology and demography

DR. ELIZABETH O'BRIEN

Colonial and post-colonial Mexico and Latin America; history of obstetric surgery; fertility control and sterilization; race and indigeneity in medicine

DR. AHMED RAGAB

Medieval and early modern medicine, Islamic medicine, history of race and medicine, colonial and postcolonial medicine and global health, medicine and religion, history of gender, sexuality, and medicine

DR. ALEXANDRE WHITE – History of Global Health; Infectious disease control; Epidemic responses; Colonial medicine and postcolonial historical approaches.

## DEPARTMENT OF GENETIC MEDICINE

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For other genetics related courses see Maternal Fetal Medicine Subinternship (Gyn/Ob), research and course opportunities in the Departments of Molecular Biology & Genetics, Pharmacology, and others.

### CLINICAL CLERKSHIP IN GENETICS

**Course Type:** Clinical Clerkship

**Department/Division:** Dept. of Genetic Medicine

**Course Director:** Dr. Joann Bodurtha

**Contact:** 410-955-1699; jbodurt1@jhmi.edu

**Faculty:** Drs. H. Bjornsson, J. Bodurtha, G. Cutting, H. Dietz, J. Fahrner, M. Gunay-Aygun, A. Hamosh, J. Hoover-Fong, H. Levy, G. Raymond, D. Valle, H. Vernon, and T. Wang

**Availability/Duration:** All year; 2-4 weeks (Q1-Q4)

**Prerequisite(s):** It is helpful to have at least one core clerkship prior to this elective

**Drop Period:** 1 month

**Description:** The Dept. of Genetic Medicine provides genetic services to patients and families across the lifespan and can tailor your learning experience to your interests and learning needs. A team approach including geneticists – both MD and PhD laboratory and quantitative experts, genetic counselors, nurse practitioners, dieticians, coordinators, and other specialists provides both inpatient and outpatient exposure to a broad range of clinical concerns. A weekly case conference and multiple other conferences provide didactic learning and discussion and are integrated with multiple other learning resources, including on-line resources for lifelong learning. Students will learn the application of the fundamentals of medical genetics and human variation in the individual and family clinical, biochemical, cytogenetic, and molecular levels. Practical experience in clinical genetics, genetic counseling, and the application of laboratory methods to clinical problems are emphasized, with the possibility of tailoring and developing projects in line with individual interests. Patients are seen from preconception to palliative care to autopsy with an emphasis on prenatal diagnosis, newborn screening, congenital anomalies, neurodevelopmental disabilities, connective tissue conditions, neurosensory conditions, skeletal dysplasias, epigenetic conditions, and the integration of genetic understanding across all medicine. The opportunity to participate in case reports and clinical/educational research can be available with multiple publications being developed with students over the years. Clinical responsibilities, all under the direct supervision of a fellow, genetic counselor, and an attending physician, include: an active inpatient consultation service, daily clinical outpatient clinical activities, and an inpatient genetics service that focuses on inborn errors of metabolism.

### ADULT GENETICS IN AMBULATORY INTERNAL MEDICINE

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine/General Internal Medicine

**Course Director:** Dr. Howard Levy

**Contact:** 410-583-2774; hlevy3@jhmi.edu

**Faculty:** Dr. Levy. Optional additional interactions with faculty in the Institute of Genetic Medicine

**Availability/Duration:** Contact course director

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 2 months

**Description:** This elective is based primarily at Green Spring Station, in an outpatient internal medicine primary care practice. There is extensive experience with routine adult primary care. Additional clinical experiences include: acquiring, recording, and interpreting a family history; genetic risk assessment for multifactorial conditions; genetic factors in prevention, treatment, and differential diagnosis of common medical conditions; ordering and interpreting genetic tests; consultative diagnostic evaluation and longitudinal primary care management of adults with traditional single-gene disorders (especially Ehlers Danlos syndrome). There is also the opportunity to interact with other geneticists in the McKusick-Nathans Institute of Genetic Medicine, depending upon the student's particular interests.

## ADVANCED TOPICS IN HUMAN GENETICS

**Course Type:** Tutorial

**Department/Division:** Medicine/Medical Genetics

**Course Director:** Drs. Roger Reeves, Kirby Smith, and Michael Parsons

**Contact:** 410-955-6624; rreeves@jhmi.edu

**Faculty:** Drs. Reeves, Smith, and Parsons

**Availability/Duration:** Q3; (M, W, F; times vary)

**Prerequisite(s):** Fundamentals of Genetics; Molecules and Cells and permission of instructor

**Drop Period:** 1 month

**Description:** This lecture/discussion course is a research-oriented introduction to principles of human genetics based on fundamental knowledge introduced in prior courses. Emphasis is placed on recent advances in knowledge, evolving techniques, and the design of research strategies, in the context of the current biomedical literature. Topics include: chromosome structure and function; chromosome aberrations; gene mapping; mutation; sex determination; inborn errors of metabolism; genetic heterogeneity; genotype environment interaction in health and disease; aneuploidy; carcinogenesis and ethical issues surrounding modern genetic medicine.

## RESEARCH OPPORTUNITIES

DR. J. BODURTHA

Genetic risk communication; family history; dysmorphology; public health genetics, community engagement

DR. G. CUTTING

Cystic Fibrosis; modifier genes; DNA diagnostics

DR. H. DIETZ

Elucidation of the pathogenesis and treatment strategies for vascular aneurysm; connective tissue disorders; fibrosis

DR. J. FAHRNER

Abnormal growth caused by aberrations in the epigenetic machinery

DR. M. GUNAY-AYGUN

Inborn errors of metabolism; clinical genetics

DR. A. HAMOSH

Integration of genetic and genomic information into the electronic health record; OMIM; understanding the molecular basis of Mendelian disorders

DR. J. HOOVER-FONG

Skeletal dysplasias and chromosomal abnormalities

DR. H. LEVY

Adult genetics; connective tissue disorders

DR. G. Raymond

Neurogenetics, Lysosomal and peroxisomal diseases

DR. N. SOBREIRA

Mendelian disease discovery; clinical sequencing informatics; PhenodB

DR. D. L. VALLE

Inborn errors of amino acid metabolism; molecular genetics

DR. H. VERNON  
Biochemical genetics

DR. T. WANG  
X-linked intellectual disability; brain development and disorders in cognitive function and behaviors.

## MEDICINE

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ME:250.699

### CLINICAL CLERKSHIP IN CARDIOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine/Cardiology

**Course Director:** Dr. Steven Jones

**Contact:** 410-502-0469; [sjones64@jhmi.edu](mailto:sjones64@jhmi.edu); Sarah Lewis, [slewis67@jhmi.edu](mailto:slewis67@jhmi.edu); Tammy Palmore, [tpalmor1@jhmi.edu](mailto:tpalmor1@jhmi.edu)

**Faculty:** Division Faculty

**Availability/Duration:** Available all year; ½ or full quarter; lottery

**Prerequisite(s):** Core Clerkships in Medicine and Surgery

**Drop Period:** 2 months

**Description:** The student participates in the activities of the Cardiovascular Division, particularly the clinical service. Through inpatient consultations, the inpatient service, and the outpatient clinics, the student gains experience in the cardiac examination, the use and interpretation of non-invasive and imaging studies (electrocardiography; exercise testing; ultrasound, nuclear, CT and MRI based imaging methods), and invasive procedures (angiography, revascularization and interventional procedures electrophysiologic studies) with emphasis on integration of history, examination and diagnostic modalities in the formulation of treatment plans.

### CLINICAL CLERKSHIP IN CARDIOLOGY – JOHNS HOPKINS BAYVIEW MEDICAL CENTER

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine/Cardiology

**Course Director:** Dr. Marlene Williams

**Contact:** 410-550-7040; [mwillia@jhmi.edu](mailto:mwillia@jhmi.edu)

**Faculty:** Drs. M. Williams, N. Chandra-Strobos, M. Mukherjee, H. Silber, E. Shapiro, D. Sun, S. Zakaria, and M Capagrossi

**Availability/Duration:** Available all year; ½ or full quarter; lottery

**Prerequisite(s):** Core Clerkships in Medicine and Surgery

**Drop Period:** 1 month

**Description:** The student participates in the activities of the Cardiovascular Division, particularly the clinical service. Through inpatient consultations, the inpatient service, and the outpatient clinics, the student gains experience in the cardiac examination, the use and interpretation of both non-invasive and invasive studies.

### CLINICAL CLERKSHIP IN CORONARY INTENSIVE CARE

#### *SITE FOR ADVANCED CLERKSHIP IN CRITICAL CARE/ICU*

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine/Cardiology

**Contact:** Dr. Steven Schulman; [sschulma@jhmi.edu](mailto:sschulma@jhmi.edu)

**Telephone Number:** 410-955-7378

**Faculty:** Drs. S. Schulman, G. Gerstenblith, R. McLean, J. Weiss, and I. Wittstein

**Availability/Duration:** All year; ½ quarter; maximum of two students

**Prerequisite(s):** Core clerkships in Medicine and Surgery

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The student participates in the daily activities of the Coronary Care Unit and works closely with the medical housestaff, cardiology fellow and attending physician. The student gains experience in the evaluation and management of critically ill cardiac patients; ventricular and atrial arrhythmias, acute myocardial infarction, and acute decompensated heart failure. In addition, the student gains experience in the interpretation of

electrocardiograms, echocardiograms, and other noninvasive studies; invasive procedures such as line placement, circulatory assist devices, angiography, angioplasty, and electrophysiological studies; and hemodynamic monitoring.

#### ADVANCED CLINICAL CLERKSHIP IN CORONARY INTENSIVE CARE – JOHNS HOPKINS BAYVIEW MEDICAL CENTER

##### *SITE FOR ADVANCED CLERKSHIP IN CRITICAL CARE/ICU*

**Course Type:** Subinternship

**Department/Division:** Medicine/Cardiology

**Course Director:** Dr. Marlene Williams

**Telephone Number:** 410-550-7040; mswillia@jhmi.edu

**Faculty:** Drs. M. Williams, N. Chandra-Strobos, M. Mukherjee, H. Silber, E. Shapiro, D. Sun, S. Zakaria, and M Capagrossi

**Availability/Duration:** All year; full or ½ quarter; three students; Enrollment limited to JHUSOM students.

**Prerequisite(s):** Core Clerkship in Medicine and at least one clinical clerkship in Pulmonary, Cardiology, or advanced General Internal Medicine.

**Drop Period:** 2 months

**Description:** The student functions as a member of the medical team at the level of an intern, with close supervision by the senior housestaff, cardiology fellow, and attending physician. Experience is gained in the evaluation and management of critically ill cardiac patients; dysrhythmia diagnosis and management; the interpretation of noninvasive studies; invasive procedures such as line placement and hemodynamic monitoring; and cardiovascular pharmacology. A sound understanding of cardiac physiology and hemodynamics is desirable.

#### ADVANCED CLINICAL CLERKSHIP IN CARDIOLOGY – UNION MEMORIAL HOSPITAL

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine/Cardiology

**Course Director:** Drs. R. Ferguson and J. Quartner

**Telephone Number:** 410-554-2284

**Faculty:** Drs. Ferguson, Quartner and staff

**Availability/Duration:** All year; ½ quarter; lottery

**Prerequisite(s):** Core Clerkship

**Drop Period:** 2 months

**Description:** The goal is to provide the student with a clinical experience in inpatient cardiology centered around the coronary care unit. Patients will be evaluated by the student as the primary physician functioning at an internship level. Patients will be followed into progressive care with the student participating in decisions relating to diagnosis and management as well as discharge planning. Emphasis will be placed upon daily teaching rounds, through which the student will be exposed to bedside teaching providing experience in auscultation and other means of diagnosis. An active laboratory, including cardiac catheterization, will provide adjunctive information on hospitalized patients. These are four-week rotations. Hours of participation are full time, along the same schedule as housestaff, with every fourth night call. The day begins at 8:00 a.m. with morning report. On-call rooms, food tickets, free parking passes, and a full-service library with Medline search and photocopying privileges are provided.

#### CLINICAL CLERKSHIP IN CONSULTATIVE ENDOCRINOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine/Endocrinology

**Course Director:** Justin Echouffo Tcheguigui, [jechouf1@jhmi.edu](mailto:jechouf1@jhmi.edu)

**Contact:** Sharice Frazier, [sfrazi10@jhmi.edu](mailto:sfrazi10@jhmi.edu) and [endorotation@jhmi.edu](mailto:endorotation@jhmi.edu)

**Faculty:** Trainees spend time with many of the clinical Endocrine faculty:

[https://www.hopkinsmedicine.org/endocrinology\\_diabetes\\_metabolism/our\\_team/](https://www.hopkinsmedicine.org/endocrinology_diabetes_metabolism/our_team/)

**Availability/Duration:** All year, ½ or full quarter; duration is flexible, but we require at least 2 weeks for those who have done their medicine rotation and at least 3 to 4 weeks, for those who have done any non-medicine core rotation.

**Prerequisite(s):** None; however, it is preferable that a core rotation has been done beforehand  
**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This elective offers students an introduction to clinical endocrinology and diabetes. Endocrinology affects all organ systems and this rotation will benefit students regardless of their career choice. Students will get substantial experience interviewing, examining, and following patients with both straightforward and complex endocrine conditions. This is accomplished by seeing patients primarily on the in-patient endocrinology consultative service at JHH. We also offer opportunities to join faculty in their outpatient clinics to help round out your experience if needed. Examples of specialty clinics include Thyroid, Metabolic Bone, Diabetes, Pituitary/Adrenal. Further, there are numerous didactic sessions on the East Baltimore campus including: i) Endocrine clinical conference (weekly on Wednesdays at 1:30), ii) Endocrine Grand rounds (weekly on Wednesday afternoons during the fall-spring), iv) Bone conference (monthly), v) Pituitary pathology conference (monthly). Other important educational opportunities that can be availed of if there is interest and time include: i) lectures to Osler interns (different times depending on the season), ii) nutrition clinics in the Hopkins Diabetes Center, ii) the diabetes foot and wound clinic – a multi-disciplinary clinic including vascular surgery, podiatry, and endocrinology; iv) transition clinic for patients with type 1 diabetes at Mt. Washington Pediatric Hospital.

As you can see, we have a wonderful diversity of educational and work experiences from which students can get an excellent grounding in clinical endocrinology. We are always excited to have students on service with us and can tailor aspects of the rotation to your needs and interests so do not hesitate to reach out if you have questions.

### **SEMINARS IN INTRACELLULAR REGULATION**

**Course Type:** Tutorial  
**Department/Division:** Medicine/Gastroenterology  
**Course Director:** Dr. Mark Donowitz  
**Contact:** 410-955-9675; [mdonowit@jhmi.edu](mailto:mdonowit@jhmi.edu)  
**Faculty:** Dr. M. Donowitz and staff  
**Availability/Duration:** All year; one hour per week  
**Prerequisite(s):** Arrange with Dr. M. Donowitz  
**Drop Period:** 1 month

**Description:** A weekly journal club focusing on the regulation of epithelial absorption and secretion by intracellular intermediates - molecular and cell biology studies in signal transduction.

### **CLINICAL CLERKSHIP IN GASTROENTEROLOGY**

**Course Type:** Clinical Clerkship  
**Department/Division:** Medicine/Gastroenterology and Hepatology  
**Course Director:** Dr. Francis M. Giardiello  
**Contact:** 410-955-2635; [lwelch@jhmi.edu](mailto:lwelch@jhmi.edu); Linda Welch  
**Faculty:** Drs. F. Giardiello, R. Chowdhury, C. Fain, J. Hamilton, M. Donowitz, M. Lazarev, G. Mullin, A. Nimgaonkar, A. Parian, J. Melia, M. Abdi, T. Abdi, T. Woreta, M. Ma, A. Kim, A.M. Lennon, S. Ngamruengphong, E. Shin, V. Singh, and M. Goggins.  
**Availability/Duration:** All year; 4 weeks or longer; visiting medical students must follow JHUSOM quarter dates  
**Prerequisite(s):** Core Clerkship in Medicine  
**Drop Period:** 1 month

**Description:** Students participate in evaluating inpatients and outpatients with a wide variety of gastroenterology complaints and problems. Interpretation of radiologic procedures, biopsies, and tests of physiologic function is an integral part of the course. Students participate in ward rounds, the Inflammatory Bowel Disease Center, the weekly GI clinical conference, the bi-weekly GI seminar, journal club, and research conference. Circumscribed clinical investigation and clinical-pathologic correlation are possible by arrangement.



### CLINICAL CLERKSHIP IN GASTROENTEROLOGY –SINAI HOSPITAL

**Course Type:** Clinical Clerkship  
**Department/Division:** Medicine/Gastroenterology  
**Course Director:** John Rabine  
**Contact:** 410-601-8706; Jcrabine@lifebridgehealth.org  
**Faculty:** Drs. Rabine, Dutta, Vinayek and Mai  
**Availability/Duration:** All year, 4 weeks, full-time.  
**Prerequisite(s):** Core Clerkship in Medicine  
**Drop Period:** 1 month

**Description:** This well-rounded senior elective in Gastroenterology provides the student with opportunities to evaluate patients on the inpatient consultation service, participate on daily teaching rounds, and attend outpatient office hours with the attending staff.

The student is encouraged to attend Joint GI-Surgery-Radiology conference as well as weekly GI Conference at Johns Hopkins Hospital.

### CLINICAL CLERKSHIP IN GERIATRIC MEDICINE BAYVIEW MEDICAL CENTER/GERIATRIC CENTER

**Course Type:** Elective  
**Department/Division:** Medicine/Geriatric Medicine and Gerontology  
**Course Director:** Dr. Danelle Cayea  
**Contact:** 410-550-7162; [crobin44@jhmi.edu](mailto:crobin44@jhmi.edu); Carolyn Robinson  
**Faculty:** Drs. M. Bellantoni, C. Boyd, J. Burton, C. Christmas, P. Colvin, D. Cayea, S. Durso, W.B. Greenough, and M. McNabney  
**Availability/Duration:** Available in quarters 1-4 only, 2-4 weeks; one student per period  
**Prerequisite(s):** Core Clerkship in Medicine  
**Drop Period:** 2 weeks

**Description:** This course is designed to provide an in-depth exposure to geriatric medicine and gerontology. The student will work closely with members of the faculty in the following programs:

**Geriatric Rehabilitation Unit:** The student will work directly in patient care gaining first-hand experience in managing patients with multiple health problems. The value of a multi-disciplinary approach to geriatric medicine will be emphasized and the student will have ample opportunity to learn to evaluate and treat many of the important problems in patients in a long-term care institution. There is no night call.

**Physician House Call Program:** The student will evaluate and follow a selected group of patients who are home-bound because of illness. This involvement will permit the student further exposure to a multidisciplinary team and sensitize the student to this important mode of geriatric health care deliver.

**Ambulatory Care:** The student may elect to spend a portion of time working with a member of the faculty in the Beacham Ambulatory Center on the Johns Hopkins Bayview Medical Center campus or a geriatrics specialty clinic such as those focused on memory, bone health and continence.

**Inpatient Care:** Experiences are also available on the hip-fracture co-management service.

**Teaching Conference:** The student will participate in the weekly clinical geriatrics rounds and seminars attended by faculty members, the clinical and research fellows, and the housestaff on geriatric medicine rotation.

**Research Seminars:** If interested, the student may participate in the divisional research seminars which often include presentations by visiting professors.

Each student may elect to emphasize one or more aspects of the program.

## CLINICAL CLERKSHIP IN ALLERGY AND CLINICAL IMMUNOLOGY – BAYVIEW MEDICAL CENTER/ASTHMA AND ALLERGY CENTER

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine/Allergy and Clinical Immunology

**Course Director:** Dr. Antoine Azar, Antoine.Azar@jhmi.edu

**Contact:** Katie Sheldon, kmcinty6@jhmi.edu

**Faculty:** Drs. N. Franklin Adkinson, Romi Saini, Jody Tversky, Jerry Shier, Alpa Jani, Kathleen Hise, Miya Paterniti, Eric Oliver, Torie Grant, Corinne Happel, Santiago Alvarez, and Melanie Dispenza

**Availability/Duration:** All year; minimum of one quarter; discuss schedule with course director; visiting medical students must follow JHUSOM quarter dates.

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 1 month

**Description:** Students will participate in three to five half day outpatient clinical sessions and two to three hours of inpatient consultations and consult rounds during each week. Attendance at teaching conferences each week is required. Divisional research conferences and Journal Clubs provide an opportunity to learn the research interests of the staff. Clinical experience in pediatric allergy and immuno-deficiency clinics can also be provided if desired. Because of the importance of longitudinal follow-up in outpatient medicine, this clerkship is taken as a six-to-eight-week block, but can be shared with other outpatient rotations, such as dermatology, if the student wishes to try more than one subspecialty during a quarter.

## RESEARCH IN ALLERGY AND INFLAMMATION

**Course Type:** Basic Research

**Department/Division:** Medicine/Allergy and Clinical Immunology

**Course Director:** Drs. Antione Azar and Dr. Don MacGlashan

**Contact:** 410-550-2101, [Antoine.Azar@jhmi.edu](mailto:Antoine.Azar@jhmi.edu)

**Faculty:** Dr. A. Azar and staff

**Availability/Duration:** All year; full or ½ quarter (3 month minimum).

**Drop Period:** 1 month

**Description:** Students may participate in on-going laboratory investigation projects under the supervision of one of the faculty. Each student will attend divisional educational activities including research conferences, journal review sessions, and clinical teaching sessions.

## ADVANCED CLINICAL ELECTIVE IN INPATIENT COVID-19 CARE

**Course Type:** Clinical Clerkship

**Department/Division:** Interdisciplinary

**Course Director:** Dr. Julianna Jung

**Telephone Number:** 443-802-6037

**Faculty:** COVID Service Faculty

**Availability/Duration:** M4 students

**Prerequisite(s):** Core Clerkship in Internal Medicine

**Drop Period:** 1 month

## **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The COVID-19 pandemic is the single greatest public health crisis of our time and is a major defining force in medicine and in public life. As of 12/7/2020, medical students in advanced clerkships have been granted permission to participate in the care of patients with confirmed or suspected COVID-19, and many have demonstrated great interest in this opportunity. As COVID-19 incidence surges in our community, there is a genuine need for clinical work to which senior medical students are extremely qualified to contribute, and engagement in this work would provide them with significant educational value.

This course focuses on the clinical care of hospitalized COVID-19 patients across various acuity levels and is a full-time clinical rotation. During their time on the COVID wards, students will be paired with clinicians responsible for admitting new patients and will actively participate in initial assessment and development of diagnostic and management plans. Students will follow their admitted patients throughout their hospitalizations and will serve as a primary source of care continuity in a clinical setting that is reliant on short-term clinician labor provided by physicians who have been redeployed from other activities to aid in the COVID-19 response. Students will also be trained as “Epic Superusers” so that they can take responsibility for order entry, documentation, and medication reconciliation for admitted patients. This will allow them to take meaningful ownership over patient care, while also providing redeployed clinicians with vital assistance, as many are unaccustomed to the inpatient Epic environment. While faculty preceptors may be redeployed from other services, all will be qualified clinicians and full-time faculty members or fellows, and will receive specific training in how to work constructively with students and optimize their educational experience.

The clinical experience will be supplemented by online learning activities including case-based discussions and virtual simulation sessions. Peer education will be incorporated with the addition of a student-run journal club, in which students will present research data on novel therapies for COVID-19 in a faculty-moderated format. Assessment will be based primarily on clinical performance evaluations completed by faculty preceptors, with smaller contributions from journal club presentation scores and degree of engagement in learning activities.

**Course Objectives:** -Conduct a thorough assessment of a COVID-19 patient, including identification of factors that influence complication risk and overall prognosis  
-Manage longitudinal care for a COVID-19 patient, including order entry, documentation, medication reconciliation, consultation with other services, and patient/family communication  
-Describe an approach to the recognition and stabilization of acute complications common among COVID-19 patients  
-Discuss recent advances in the scientific foundations of COVID-19 care

#### ADULT INFECTIOUS DISEASES –JOHNS HOPKINS BAYVIEW MEDICAL CENTER

**Course Type:** Consult Service

**Department/Division:** Medicine/Infectious Disease/JHBMC

**Course Director:** Dr. Khalil Ghanem

**Contact:** Lin Rucker, [brucker2@jhmi.edu](mailto:brucker2@jhmi.edu)

**Faculty:** Drs. Mark Sulkowski, Jonathan Zenilman, Anne Rompalo, Khalil Ghanem, Geeta Sood, Erica Johnson, Sue Tuddenham, David Sullivan, Kawsar Talaat, William Wright, Oluwaseun Falade, and Mamuka Machaidze

**Availability/Duration:** 2-4 weeks; all year

**Prerequisite(s):** Core Clerkships in Medicine and/or Surgery

**Drop Period:** 2 months

**Description:** Students will be assigned one consult per day and will follow their patients throughout their hospital course. Students will be responsible for deriving a care plan on each of these patients, in consultation with the fellow and attending. Students will be exposed to a broad variety of diagnoses. Students will be expected to review the scientific data guiding their clinical decisions and discuss these data with the team. The goal of this elective is to become familiar with diagnosing and managing common infectious diseases with a particular focus on making appropriate antibiotic choices.

#### CLINICAL CLERKSHIP IN INFECTIOUS DISEASES UNION MEMORIAL HOSPITAL

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine/Infectious Disease

**Course Director:** Dr. Wayne Campbell

**Contact:** 410-554-2284; [wayne.campbell@medstar.net](mailto:wayne.campbell@medstar.net)

**Faculty:** Dr. W. Campbell and staff

**Availability/Duration:** ½ quarter; all year

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 1 month

**Description:** This elective provides an opportunity for students to see patients with both medical and surgical infectious diseases. Students will participate as a member of the consult team seeing patients in inpatient and outpatient settings. Instruction is provided through working closely with the attending, attending clinical conferences, and through readings. Free parking and use of the Medline computer and photocopier; no weekend duties required.

#### CLINICAL CLERKSHIP IN INFECTIOUS DISEASES SINAI HOSPITAL

**Course Type:** Consultation Service

**Department/Division:** Medicine/Infectious Disease

**Course Director:** Dr. Kjell Wiberg, [kwiberg@lifebridgehealth.org](mailto:kwiberg@lifebridgehealth.org)

**Faculty:** Drs. A. Mayrer, J. Gradon, and K. Wiberg

**Availability/Duration:** All year; one or two students per ½ quarter; not offered in academic year 2020-21

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 1 month

**Description:** This elective offers medical students an opportunity to evaluate patients on the Infectious Diseases (I.D.) teaching and consultative service under the supervision of the division's attending staff Drs. Gradon and Mayrer. Students will also regularly evaluate outpatients with HIV, hepatitis C, and other infectious diagnoses in the Infectious Disease Ambulatory Center under the supervision of Drs. Cmar and Wiberg.

Medical students have the opportunity to assist in any Hospital based antibiotic utilization review studies, antibiotic trials, or other ongoing clinical projects.

#### CLINICAL CLERKSHIP IN INFECTIOUS DISEASES

**Course Type:** Clinical Elective

**Department/Division:** Medicine/Infectious Disease

**Course Director:** Dr. Michael Melia

**Contact:** [IDFellowship@jhmi.edu](mailto:IDFellowship@jhmi.edu)

**Faculty:** Division Faculty

**Availability/Duration:** All year; 3 weeks or longer; limited to two students at a time; lottery

**Prerequisite(s):** Core Clerkship in Medicine and Surgery Clerkship

**Drop Period:** 2 months

**Description:** A rotation on the general ID inpatient consultation service provides the opportunity to participate in the evaluation and management of a wide range of ID problems. By working alongside our faculty, fellows, and clinical pharmacists, rotating residents and students experience a rich and educational introduction to the world of clinical ID. Students answer consultation requests, review findings with fellows, and present cases to the attending on afternoon rounds held daily. The goals of the elective are to provide guidelines to an approach to patients with established or suspected infections. Methods to establish an etiologic diagnosis and rational use of antibiotics are emphasized.

#### ELECTIVE IN AMBULATORY CARE – SINAI HOSPITAL

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine

**Course Director:** Dr. Asha Thomas

**Contact:** 410-601-5284; [athomas@lifebridgehealth.org](mailto:athomas@lifebridgehealth.org)

**Faculty:** Division faculty

**Availability/Duration:** All year; 4 weeks, full-time.

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 1 month

**Description:** The student is given an opportunity to evaluate and treat patients in an office setting designed as a model group practice. Students are supervised by full-time faculty clinicians, and gain familiarity in treating common ambulatory adult diseases as well as an appreciation for the process and nuances of the office visit.

Approach is patient-centered, with a discussion of each patient with a faculty preceptor after the initial student evaluation. There is opportunity to follow a patient longitudinally over the course of the month.

The student has the opportunity to attend all Department of Medicine conferences including Noon Conference.

### SUBINTERNSHIP IN INTERNAL MEDICINE –SINAI HOSPITAL

**Course Type:** Subinternship  
**Department/Division:** Internal Medicine  
**Course Director:** Dr. John Cmar  
**Faculty:** Dr. Cmar and division faculty  
**Contact:** 410-601-7068; jcmarr@lifebridgehealth.org  
**Availability/Duration:** All year; 4 weeks, full-time  
**Prerequisite(s):** Core Clerkship in Medicine  
**Drop Period:** 1 month

**Description:** The Sinai Hospital Program in Internal Medicine offers an outstanding Sub-Internship experience in an academically oriented community teaching hospital, with a broad-based patient population. Students function as integral members of the house staff team on a general medicine unit in the same capacity as interns except with limited patient load. Students are expected to participate in all aspects of patient care and are encouraged to be primarily responsible for clinical decisions and bedside procedures. Students take new admissions every other day and overnight call is not required because of night float coverage.

Sub-Interns will also participate in all the teaching activities of the department, including daily noon conferences and Department of Medicine Grand Rounds weekly. A wide range of ancillary services are available. Lunch is provided with noon conferences, an allotment for meals is given for admission days and parking are all provided. Students have 24/7 access to both the Physician's Lounge as well as the Eisenberg Medical Library and Simulation Center.

### ADVANCED CLERKSHIP IN MEDICINE (SUBINTERNSHIP)

#### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship  
**Department/Division:** Medicine/General Internal Medicine  
**Course Director:** Dr. Amit Pahwa  
**Contact:** Jennifer Weaver, 410-955-9655  
**Availability/Duration:** Year round  
**Prerequisite(s):** Core Clerkship in Medicine  
**Drop Period:** 2 months. If a student wishes to drop with less than 2 months prior to the rotation, he or she must find a replacement.

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description: Students** can serve as subinterns on one of Osler Firm services or the Brancati Service. The Firms are general internal medicine inpatient ward teams that consist of interns, third year residents, and an Assistant Chief Resident or Firm Faculty as an attending. The Brancati Service is a general internal medicine inpatient ward team that consists of interns, second year residents, and Hospitalist Faculty as attending. Patients are assigned to each subintern, who fulfills the responsibilities of an intern by admitting and caring for patients on the medical services.

### SUBINTERNSHIP IN MEDICINE - JOHNS HOPKINS HOWARD COUNTY GENERAL HOSPITAL

#### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship  
**Department/Division:** Medicine/General Internal Medicine  
**Course Director:** Dr. Brad Strunk, bstrunk@jhmi.edu  
**Contact:** Dr. Jumana Kaka; [jkaka1@jhmi.edu](mailto:jkaka1@jhmi.edu)

**Availability/Duration:** Year round

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 2 months. If a student wishes to drop with less than 2 months prior to the rotation, he or she must find a replacement.

**Description:** Please contact Jumana Kaka for further information.

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

#### **ADVANCED CLERKSHIP IN MEDICINE - HOSPITALIST SERVICE**

##### ***APPROVED SUB-I EXPERIENCE***

**Course Type:** Subinternship

**Department/Division:** Medicine/ General Internal Medicine

**Course Director:** Dr. Padmini Ranasinghe

**Contact:** Lisa Williams Jones; 443-287-3631; [lwilli45@jhmi.edu](mailto:lwilli45@jhmi.edu)

**Faculty:** Hospitalists

**Availability/Duration:** Two-three slots every month; 4 weeks

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 1 month

**Description:** This subinternship allows students to work one-on-one with faculty attendings (no interns or residents) on the general medicine inpatient service. Like the Osler firms the hospitalist service admits a mixture of both community patients with “bread and butter” diagnoses and tertiary referral transfers with more complicated and uncommon illnesses. As the primary trainee provider for your patients, you will have great hands-on experiences which lead to valuable “teaching moments” to have before starting any residency. The structure creates many opportunities for you to shine as you are evaluated personally by the hospitalist attendings you work with weekly. There is no overnight call, but you will be expected to take call three times per week from 7 a.m. to 8 p.m. Twice a week didactic conferences as well as formal and informal feedback are provided regularly.

For more information, please see the link to the hospitalist sub-intern webpage on:

[http://www.hopkinsmedicine.org/gim/training/SubI\\_rotation.html](http://www.hopkinsmedicine.org/gim/training/SubI_rotation.html)

#### **ADVANCED CLERKSHIP IN HOSPITAL MEDICINE –JOHNS HOPKINS BAYVIEW MEDICAL CENTER**

##### ***APPROVED SUB-I EXPERIENCE***

**Course Type:** Subinternship

**Department/Division:** Internal Medicine/ Collaborative Inpatient Medical Service

**Course Director:** Dr. Amteshwar Singh, [asingh42@jhmi.edu](mailto:asingh42@jhmi.edu), 410-550-5018

**Contact:** Nuru Shabazz, [nshabaz2@jhmi.edu](mailto:nshabaz2@jhmi.edu)

**Faculty:** Hospitalist physicians of the division of Hospital Medicine

**Availability/Duration:** 3-4 weeks; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Completion of year 1 and year 2 of Medical School; has completed medicine core clerkships

**Drop Period:** 2 months

**Description:** Over a 4-week period, approximately 20 shifts will be scheduled. This will provide a more robust experience for students to have continuity with attendings and patients and will prepare sub-Is even better to start their intern. This is a 2 or 4-week elective that exposes students to all key aspects of Hospital Medicine that are not included in a typical medicine clerkship. The elective assesses the students’ knowledge of Hospital Medicine and the students’ skills in various skills required for Hospitalist practice. The course experiences include:

- Direct patient care with attending physicians on the Hospitalist inpatient and medical consultation services
- Shadowing of Triage physicians to learn the systems based on practice aspects of hospital medicine
- Working with other multidisciplinary team members: case managers, physician assistants, nurse practitioners, physical and occupational therapists, and social workers.
- May include Didactic sessions on Hospital Medicine, billing and documentation guidelines, standardized practice guidelines on commonly encountered diseases in hospitalized patients, building communication skills, and contract negotiations.

-Opportunity to collaborate on a longitudinal scholarly activity experience that may extend beyond the rotation duration (this activity is not graded).

### HOSPITAL MEDICINE ELECTIVE –HOWARD COUNTY GENERAL HOSPITAL

**Course Type:** Clinical Clerkship

**Department/Division:** Internal Medicine/ Collaborative Inpatient Medical Service (HCG)

**Course Director:** Dr. Rishi Kumar

**Contact:** Jumana Kaka; [jkaka1@jhmi.edu](mailto:jkaka1@jhmi.edu)

**Faculty:** Drs. Melinda Kantsiper, Anirudh Sridharan, Lily Hua, Yojana Dange, Corinne Ahmar and other JHCP hospitalists.

**Availability/Duration:** 2 weeks

**Prerequisite(s):** Completion of year 1 and year 2 of Medical School; has started clerkships.

**Drop Period:** 2 months

**Description:** This rotation is a clinical elective in hospital medicine for 3<sup>rd</sup> and 4<sup>th</sup> year medical students. Students will work one-on-one with Johns Hopkins medical attendings. They will admit and follow a panel of patients, write notes, and get training and feedback on all aspects of internal medicine in the hospital. We have a diverse patient population, with some patients who have excellent access to care and high health literacy and some patients who have poor access to outpatient care and who are medically vulnerable. We are an amazing place for students to get one-on-one mentoring from attendings and to see a variety of common internal medicine cases. In addition, we focus on excellent communication with outpatient providers and safe transitions of care. Our physicians are in the hospital 24/7 so students can experience overnight shifts or weekend shifts if they wish.

### GENERAL INTERNAL MEDICINE CONSULTATION SERVICE

**Course Type:** Consultation Service

**Department/Division:** Medicine/Division of Hospital Medicine

**Course Director:** Dr. Becca Engels, [rengels2@jhmi.edu](mailto:rengels2@jhmi.edu)

**Faculty:** Hospitalist Division faculty

**Availability/Duration:** All year

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 1 month

**Description:** Students care for a diverse group of patients seen by the General Internal Medicine Consultation Service. The most common referring services are neurosurgery, orthopaedics, gynecology, plastic surgery, PM&R, and psychiatry. Particular emphasis is given to peri-operative medicine and an evidence-based approach to care.

The students evaluate the patients initially and then present the patient care problem(s) to the attending faculty and general internal medicine fellows. Students follow-up on the patients daily as they round with the fellow and make additional recommendations for evaluation and management. Near the end of the experience, the students present a case to the fellow and attending that they have seen on the service and discuss the essential features from an evidence-based medicine perspective.

Learning modules (<https://www.shmlearningportal.org/content/shm-consults-core-curriculum>) covering a wide range of consultation topics are provided. Students will receive teaching daily from the fellow on rounds and at least three times a week from the attending. Students will work directly with the attending.

The clerkship is particularly appropriate for students interested in entering a field of surgery, anesthesiology, psychiatry, or internal medicine.

You can find more information about the service on our website:

<https://www.hopkinsmedicine.org/hospitalists/consultation/index.html>



## ADULT GENETICS AND AMBULATORY INTERNAL MEDICINE

### ADVANCED TOPICS IN HUMAN GENETICS

### CLINICAL CLERKSHIP IN GENETICS

(See Dept. of Genetic Medicine for Genetics Courses)

### CLINICAL CLERKSHIP IN MEDICAL INTENSIVE CARE

#### *SITE FOR ADVANCED CLERKSHIP IN CRITICAL CARE/ICU*

**Course Type:** Subinternship

**Department/Division:** Medicine/Pulmonary and Critical Care Medicine

**Course Director:** Dr. Roy Brower

**Contact:** 410-614-6292; [cweaver1@jhmi.edu](mailto:cweaver1@jhmi.edu); Cate Weaver

**Faculty:** Dr. R. Brower and division faculty

**Availability/Duration:** 1-2 students each ½ quarter; not available in July or August.

**Prerequisite(s):** Core Clerkship in Medicine and at least one other rotation in medicine or surgery.

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** During this rotation medical students learn an approach to the critically ill patient, enhance their knowledge of respiratory and circulatory physiology and pathophysiology, and build on their abilities to evaluate and manage patients with complex and/or critical problems, as well as medical patients in general.

Students will see patients with other problems including endocrine emergencies, hyper and hypothermia, cardiac arrhythmias, CNS hemorrhage, etc. Most patients' problems are complex, involving several organ systems.

Each MICU team consists of an attending physician, the MICU nursing staff, five house officers, and a critical care fellow. Medical students take call with the housestaff, obtain histories, and perform physical examinations, gather, and integrate laboratory data and pertinent information from literature, participate in decision making, write admission and progress notes, etc. Students will observe various critical care procedures such as managing multiple intravenous lines, SwanGanz and central venous catheters, administration of medications such as antibiotics and pressors. Under the supervision of the resident or the attending, students may perform certain procedures.

### STUDENT INTERNSHIP IN MEDICAL INTENSIVE CARE – UNION MEMORIAL HOSPITAL

**Course Type:** Advanced Clinical Clerkship

**Department/Division:** Internal Medicine/Intensive Care

**Course Director:** Dr. Robert Ferguson and Dr. Philip Buescher

**Contact:** 410-554-2284; [marge.wolford@medstar.net](mailto:marge.wolford@medstar.net); Marge Wolford

**Faculty:** Dr. P. Buescher, Dr. R. Ferguson and staff

**Availability/Duration:** All year; ½ quarter

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 1 month

**Description:** An advanced experience for senior students in the management of patients in the intensive care unit. Students will be supervised by the residents and attending physicians. Students will have the responsibility for initial evaluation and management, writing orders, scheduling of diagnostic procedures, and arriving at decisions regarding day-to-day management, all closely supervised by the medical resident. The student works the same schedule as the resident staff, including call every fourth night. The day begins at 8:00 a.m. with morning report. On call rooms, library privileges, and free parking are provided.



## ADVANCED CLINICAL CLERKSHIP IN MEDICINE – JOHNS HOPKINS BAYVIEW MEDICAL CENTER

### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship  
**Department/Division:** Internal Medicine  
**Course Director:** Dr. Janet Record  
**Contact:** 410-550-8375; Farrah Howard, fhoward5@jhmi.edu  
**Faculty:** Dr. Record and staff  
**Availability/Duration:** Available year-round; four students; ½ quarter  
**Prerequisite(s):** Core Clerkship in Medicine  
**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The student will have the responsibilities of a medicine intern under the supervision of an assistant resident and an attending physician on one of the inpatient general medicine teaching teams. The responsibilities are similar to those of an intern on the service, but with fewer patients and with more direct resident supervision. The student will admit patients in rotation, evaluate these patients thoroughly, and formulate management plans, pend orders for co-signature by the resident, and will serve as first call (nurses' first point of contact for questions about patient care). The student will also hone skills in written and verbal handoff of patient care between shifts, with resident supervision. The student functions as part of a ward team which takes long call every fourth day and short call in-between. Typically, the subintern admits one patient on long call and one to 2 patients on short call (one of these usually admitted by the night team member), with a total service of about three or four patients. Students participate fully in the activities of the unit and attend conferences, including morning report, noon conference, and Grand Rounds.

The Bayview subinternship offers an outstanding patient population, the ability to function as an important part of the team, autonomy supported by supervision and teaching by residents and attending physicians, a collegial environment, and opportunities for mentoring and career advice by faculty and other program leaders.

## ADVANCED CLINICAL CLERKSHIP IN MEDICINE (SUBINTERNSHIP) –GREATER BALTIMORE MEDICAL CENTER

**Course Type:** Advanced Clinical Clerkship  
**Department/Division:** Internal Medicine  
**Course Director:** Dr. Paul Foster  
**Telephone Number:** Brenda Sizemore-Kuczinski;  
bsizemore-kuczinski@gbmc.org  
**Faculty:** Dr. Foster and staff  
**Availability/Duration:** All year; ½ quarter; 2 students. No students in July.  
**Prerequisite(s):** Core Clerkship in Medicine  
**Drop Period:** 1 month

**Description:** The clerkship focuses on the principles of diagnosis and management of medical patients in the inpatient setting. Students will work closely with the resident staff and faculty of the general medical service at GBMC. Night call is not required but encouraged. Students will carry a patient load of two to three patients.

## STUDENT INTERNSHIP IN MEDICINE – UNION MEMORIAL HOSPITAL

**Course Type:** Subinternship  
**Department/Division:** Internal Medicine  
**Course Director:** Drs. Robert P. Ferguson and Stephanie A. Detterline  
**Contact:** 410-554-2284; [marge.wolford@medstar.net](mailto:marge.wolford@medstar.net); Marge Wolford  
**Faculty:** Drs. R. Ferguson, S. Detterline, and attending staff  
**Availability/Duration:** All year; 4 weeks  
**Prerequisite(s):** Core Clerkship in Medicine  
**Drop Period:** 2 months

**Description:** This program is designed to give senior students clinical experience similar to that of interns. Supervision will be provided immediately by the senior resident with whom the student works quite closely as well as by full-time and part-time attending physicians. The student will be given primary responsibility for initial patient evaluation and management which will include writing of orders, scheduling and performance of special diagnostic procedures and decisions relating to day-to-day management and eventually, discharge and follow-up plans. The student will be an active participant in the department's educational program. The student will follow the housestaff schedule. Free parking in the hospital garage is provided.

**ADDICTION MEDICINE – JOHNS HOPKINS BAYVIEW MEDICAL CENTER**

**Course Type:** Advanced Clinical Clerkship

**Department/Division:** Internal Medicine

**Course Director:** Drs. Michael Fingerhood and Darius Rastegar

**Contact:** 410-550-1134; mifinger@jhmi.edu

**Faculty:** Drs. M. Fingerhood, D. Rastegar, M. Buresh, and L. D. Martin

**Availability/Duration:** All year; 2-4 weeks

**Prerequisite(s):** Completion of third year of medical school preferred

**Drop Period:** 2 months

**Description:** This rotation exposes medical students to expert faculty/fellows and innovative treatment for patients with addiction on the Bayview campus. It provides a unique mix of inpatient and outpatient care of patients with substance use disorders from an internal medicine perspective. Students will spend time on our addiction medicine consult service and on the addiction medicine unit, a 16-bed inpatient unit which admits patients for treatment of withdrawal. The Comprehensive Care Practice is a primary care practice which focuses on providing care for patients with substance use disorders, hepatitis C and HIV infection. Over 650 patients receive buprenorphine treatment integrated with their medical care. The fourth-year medical student who takes this elective will also participate in case conference and journal club.

**ELECTIVE IN CLINICAL EXCELLENCE WITH THER MILLER-COULSON ACADEMY**

**Course Type:** Other

**Department/Division:** Medicine

**Course Director:** Dr. Scott Wright

**Contact:** 410-550-0512; Kimberly Williams; [ksimmers@jhmi.edu](mailto:ksimmers@jhmi.edu)

**Faculty:** Members of the Miller-Coulson Academy of Clinical Excellence

**Availability/Duration:** All year; 2-4 weeks. The faculty member will provide the specific schedule

**Prerequisite(s):** None

**Drop Period:** 1 month

**ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This 2-4 week elective will be a great learning experience for students interested in learning about clinical excellence first-hand across specialties and clinical settings. Faculty members inducted into the Miller-Coulson Academy of Clinical Excellence are highly clinically active faculty who are revered for their clinical excellence by their peers, patients, and trainees. Students will have the opportunity to spend a day and work with a selection of Academy members in their various clinical settings while reflecting on the processes and outcomes related to excellence in patient care.

The Miller-Coulson Academy's definition of clinical excellence in academic medicine is "Achieving a level of mastery in the following six areas as they relate to patient care: 1) communication and interpersonal skills; 2) professionalism and humanism; 3) diagnostic acumen; 4) skillful negotiation of the healthcare system; 5) knowledge; 6) scholarly approach to clinical practice, and exhibiting a passion for patient care, and explicitly modeling this mastery to medical trainees."

Elective experiences will include:

- Direct patient care with multiple physician Academy members
- Review of literature related to excellence in patient care

-Narrative reflective writing about what the student observes in spending time with role model clinicians and how this influences their idea of the physician that they aspire to become.

### HOPKINS HEALTH MANAGEMENT ADVISORY GROUP

**Course Type:** Other  
**Department/Division:** Medicine  
**Course Director:** Dr. Sanjay Desai  
**Contact:** [sanjaydesai@jhmi.edu](mailto:sanjaydesai@jhmi.edu)  
**Faculty:** Dr. Sanjay Desai  
**Availability/Duration:** 4 to 5 hours per week  
**Prerequisite(s):** None  
**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The Hopkins Health Management Advisory Group (HHMAG) was established to provide students with an education in the management and administration in academic health systems. Students gain experience in the core skills of communication, problem solving, and team and project management. These are skills required for success as a leader across any roles in healthcare. Students begin the course with a boot camp experience introducing the basic skills they are expected to learn, as well as an overview of the Johns Hopkins Medicine organization.

The students are divided into teams and assigned an important health system problem to help solve. Each team will have both a student advisor with prior HHMAG experience and a project sponsor, who is an institutional leader within Johns Hopkins Medicine. The team, in conjunction with the project sponsor and course director, will determine the goals and scope of the project. They will create a proposal detailing these goals and a timeline to show how they will achieve these goals. Teams will then use a variety of techniques to fulfill their goals and give a presentation to the relevant health system leaders.

### PALLIATIVE CARE AND PAIN CLINICAL ELECTIVE

**Course Type:** Clinical  
**Department/Division:** Medicine/Palliative Medicine  
**Course Director:** Dr. Danielle Doberman, [ddoberm1@jhmi.edu](mailto:ddoberm1@jhmi.edu)  
**Faculty:** Various members of the Palliative Medicine Team  
**Telephone Number:** 410-955-8305  
**Contact:** Christina Kennon, [ckennon2@jhmi.edu](mailto:ckennon2@jhmi.edu)  
**Availability/Duration:** Flexible. 1, 2, or 4 weeks, Monday-Friday only; typical hours 8:00 am-5:00 pm  
**Drop Period:** 1 month

**Description:** This elective will provide an introduction to Palliative Medicine and Hospice care. Over 90% of hospitals now have palliative care programs, based on evidence showing better quality of life, better quality of care, and even improved survival compared to usual care when palliative assists a patient. Clinical experiences may include a mix of inpatient consultations at JHH (both within the Sidney Kimmel Comprehensive Cancer Center and the main hospital), outpatient consultations within various stand-alone palliative care clinics in Viragh, Weinberg and JHOC, as well as hospice experiences at local hospice agencies. Opportunities to engage with social work and chaplaincy also exist. The learning curriculum will emphasize palliative care principles focusing on communication, goals of care discussions, family meetings, and a varying degree of basic and complex symptom management. This experience offers hands-on experience having difficult conversations, including sharing bad news and discussing prognosis, while also practicing opioid conversions, evaluating adjuvant therapies for complex symptoms, and developing care plans to transition a patient across multiple care settings. This elective will offer an individualized learning plan based on each unique learner's goals as well as provide necessary foundational knowledge to effectively communicate with patients and their families in times of stress and crisis, complicated by emotion. The skills gained throughout this experience can be carried forward and applied in any setting with any patient.

### CLINICAL PHARMACOLOGY/ INTERNAL MEDICINE

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine/Clinical Pharmacology

**Course Director:** Dr. Brent G. Petty

**Contact:** 410-955-8181; [bgp@jhmi.edu](mailto:bgp@jhmi.edu)

**Availability/Duration:** All year; ½ quarter; not offered during academic year 2020-21

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 2 months

**Description:** This elective emphasizes the fundamentals of rational drug therapy in the context of a tertiary care hospital and primary care clinic. Students will participate in an outpatient primary care clinic at the Johns Hopkins Outpatient Center one half-day per week, as well as inpatient care of this clinic population when necessary. Students will join in review sessions of questions posed to the Drug Information Center and learn how to use various resources to answer these questions. Research conferences within the Clinical Pharmacology Division will be open to the student and attendance at twice monthly student journal clubs will be required. The student will be invited to attend the monthly Pharmacy and Therapeutics Committee meeting and join the Hospital Pharmacologist and Drug Center staff in responding to questions and issues arising within the hospital.

### CLINICAL CLERKSHIP IN PULMONARY DISEASES AND CLINICAL PULMONARY PHYSIOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine/Pulmonary and Critical Care Medicine

**Course Director:** Dr. Ramana Sidhaye

**Contact:** 410-614-6292; [cweaver1@jhmi.edu](mailto:cweaver1@jhmi.edu); Cate Weaver

**Faculty:** Division Faculty

**Availability/Duration:** All year; ½ quarter or longer by prior arrangement

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 1 month

**Description:** Students participate in the consultation service of the Respiratory Division at the Johns Hopkins Hospital. Students will evaluate, under the supervision of a fellow and an attending physician, patients with a wide variety of lung diseases, recommend diagnostic and therapeutic options, and follow patients during the course of their pulmonary problems. Students attend radiology conferences and seminars of the division.

### PULMONARY DISEASES AND CRITICAL CARE MEDICINE – UNION MEMORIAL HOSPITAL

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine/Pulmonary and Critical Care Medicine

**Course Director:** Drs. Raja Ayash and Robert Ferguson

**Contact:** 410-554-2284; [marge.wolford.medstar.net](mailto:marge.wolford.medstar.net); Marge Wolford

**Faculty:** Drs. R. Ayash, P. Buescher, P. Sloane, R. Ferguson, and S. Rizk.

**Availability/Duration:** All year. 4 to 8 weeks, full time.

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 1 month

**Description:** The pulmonary elective involves exposure to pulmonary medicine and critical care medicine on a daily basis. The student is involved with pulmonary consultations on an inpatient and outpatient basis with faculty supervision. The student is also involved with pulmonary and critical care procedures to include interpretation of pulmonary function tests and arterial blood gases. The student will attend all conferences, an outpatient Chest Clinic, daily teaching rounds and radiology rounds. Free parking is available in the hospital lot; full-service library with Medline computer search available.

### CLINICAL CLERKSHIP IN PULMONARY DISEASES –SINAI HOSPITAL

**Course Type:** Consultation Service

**Department/Division:** Medicine/Pulmonary and Critical Care Medicine

**Course Director:** Dr. Steven Schonfeld  
**Contact:** 410-484-9595; [sschonfe@lifebridgehealth.org](mailto:sschonfe@lifebridgehealth.org)  
**Faculty:** Drs. S. Schonfeld, I. Hoffman, R. Rubinfeld, J. Brauer, and J. Klein  
**Availability/Duration:** All year, ½ quarter; one student.  
**Prerequisite(s):** Core Clerkship in Medicine  
**Drop Period:** 1 month

**Description:** This elective involves the student in the full spectrum of inpatient pulmonary consultations. The student will see patients with the attending physician and have the opportunity to learn the technique of thoracentesis and observe bronchoscopies and other procedures. The student will also see patients with various sleep disorders. The student will learn the proper indications for pulmonary function studies and other pulmonary diagnostic studies. The student will receive instruction on the proper interpretation of pulmonary function studies.

### CLINICAL CLERKSHIP IN NEPHROLOGY

**Course Type:** Clinical Clerkship  
**Department/Division:** Medicine/Nephrology  
**Course Director:** Dr. C. John Sperati  
**Contact:** 443-927-3140; Terri Hennel; [thennel1@jhmi.edu](mailto:thennel1@jhmi.edu)  
**Faculty:** Drs. M. Atta, D. Fine, S. Gautam, M. Monroy, G. Raman, S. Sozio, J. Sperati, and S. Turban  
**Availability/Duration:** JHUSOM Students; all year; two students; ½ or full quarter. Non-JHUSOM students: October-June only  
**Prerequisite(s):** Core Clerkship in Medicine  
**Drop Period:** 2 months

**Description:** This clinical elective is designed to provide the student with practical clinical work in nephrology including diagnostic evaluations on inpatients; participation in dialysis and the management of chronic kidney disease; management of electrolyte disorders, and management of acute renal failure. The student works closely with the fellow on the renal service and the attending physician, rounds daily on inpatient consults (which average four per day), and follows patients.

### NEPHROLOGY ELECTIVE – JOHNS HOPKINS BAYVIEW MEDICAL CENTER

**Course Type:** Consultation Service  
**Department/Division:** Medicine/Nephrology  
**Course Director:** Dr. Sumeska Thavarajah  
**Contact:** Sumeska Thavarajah, [sthavar1@jhmi.edu](mailto:sthavar1@jhmi.edu) & Shani Wallace-Terry, [swalla34@jhmi.edu](mailto:swalla34@jhmi.edu)  
**Faculty:** Drs. D. Crews, D. Geetha, M. Grams, G. Raman, S. Sozio, and S. Thavarajah  
**Availability/Duration:** All year; one student per month  
**Prerequisite(s):** Core Clerkship in Medicine  
**Drop Period:** 1 month

**Description:** Students will participate in the complete range of clinical nephrology activities at Johns Hopkins Bayview Medical Center with emphasis on inpatient and outpatient consultative nephrology; daily rounds (Mon-Fri) with the consult team, renal and transplant clinics, several teaching conferences, and journal clubs; introduction to end stage renal disease modalities (hemodialysis, CAPD, renal transplant); some required reading.

### CLINICAL CLERKSHIP IN RHEUMATOLOGY

**Course Type:** Clinical Clerkship  
**Department/Division:** Medicine/Rheumatology  
**Course Director:** Dr. Antony Rosen and Dr. Allan Gelber  
**Contact:** Kelly Hueter, [khueter1@jhmi.edu](mailto:khueter1@jhmi.edu)  
**Faculty:** Drs. A. Gelber, A. Rosen, B. Adler, J. Albayda, B. Antiochos, A. Baer, C. Bingham, L. Cappelli, L. Christopher-Stine, D. DiRenzo, T. Grader-Beck, U. Haque, L. Hummers, Z. McMahan, C. Mecoli, J. Miller, A. Orbai, J. Paik, M. Petri, P. Seo, A. Shah, H. Timlin and E. Tiniakou  
**Availability/Duration:** One-two student(s) at a time; available for 1, 2, 3, or 4 weeks

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 1 month

**Description:** This elective teaches a general approach to the differential diagnosis of rheumatic diseases, the rheumatology physical exam, and the principles of treatment of common rheumatic disorders. Students will actively participate on the inpatient consultation service at Johns Hopkins Hospital or at Johns Hopkins Bayview Medical Center, by working with the fellows and attending rheumatology consultant. There will be significant opportunity for one-to-one teaching. Students will also attend the weekly Rheumatology Rounds Conference.

#### CLINICAL RESEARCH IN RHEUMATOLOGY

**Course Type:** Clinical Research

**Department/Division:** Medicine/Rheumatology

**Course Director:** Dr. Michelle Petri

**Contact:** Kelly Hueter, [khueter1@jhmi.edu](mailto:khueter1@jhmi.edu)

**Availability/Duration:** Usually one month during the academic year; summer project may be longer period.

**Drop Period:** 3 months

**Description:** Lupus erythematosus is a chronic auto-immune disease of young women that affects virtually every organ system. In the past students have been able to publish an abstract and paper on their work. Recent topics include coronary artery disease, thrombotic events, miscarriage, preterm birth, hyperlipidemia, satisfaction with care and measuring disease damage.

#### INTRODUCTION TO TELEHEALTH IN ADULT AMBULATORY MEDICINE

**Course Type:** Other

**Department/Division:** Medicine

**Course Director:** Dr. Colleen Christmas, [cchristm@jhmi.edu](mailto:cchristm@jhmi.edu)

**Contact:** Iris Knox, [iknox1@jhmi.edu](mailto:iknox1@jhmi.edu)

**Faculty:** Dr. Colleen Christmas, Dr. Sharon Dlhosh, Dr. Judith Greengold, Dr. Brian Hasselfeld, Dr. Maura McGuire, and Dr. Sean Tackett

**Availability/Duration:** Elective may be offered in the future

**Prerequisite(s):** Successful completion of two Core Clerkships, including Medicine

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This elective is designed to provide students with an introductory experience in telehealth in an ambulatory practice setting caring for adult patients. Students will take on an active role providing primary care to adult patients; work closely with a preceptor in Internal Medicine, Med-Peds, or Family practice. Students will also learn about technical, societal, and legal issues related to delivery of telehealth.

#### PROFESSIONAL IDENTITY (TRANS)FORMATION: AN ART MUSEUM-BASED ELECTIVE

**Course Type:** Other

**Department/Division:** Psychiatry and Behavioral Sciences and Medicine

**Course Director:** Dr. Margaret Chisolm, [mchisol1@jhmi.edu](mailto:mchisol1@jhmi.edu)

**Faculty:** Heather Kagan MD and Bonnie Marr MD, with guest facilitation by Kaitlin Stouffer MSc, Mark Stephens MD, Paul Haidet MD, as well as museum educators Philip Yenawine, Elizabeth Benskin, and Suzy Wolffe

**Availability/Duration:** This course is available to any 3rd or 4th year JHUSOM student. Enrollment is limited to 15 students, and the course will be offered if at least 5 students enroll and if in-person teaching is permitted by JHU and the Baltimore Museum of Art, as anticipated. Course is offered second half of block VI (Feb 22- March 12, 2021).

**Prerequisite(s):** N/A

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This highly interactive 3-week arts and humanities course will take place primarily at the Baltimore Museum of Art and other local museums, although we will engage in a few arts-based experiences in clinical settings and online. This course is about professional identity (trans)formation, and builds on what you have learned in Years 1-4 of the College Advisory Program TIME Small Group Teaching Sessions about your sense of self and professional identity, and complements what you may have experienced in the 1-week elective, "Online Art Museum Exploring Professional Identity through Art." Priority enrollment will be given to Year 4 students as what you learn here is designed to prepare you to thrive personally and professionally during your residency training and throughout your career. The course uses the Baltimore Museum of Art and other regional museums, as well as a local innovators' space (Fast Forward U) and other non-clinical settings for a combination of small group problem-solving and creating activities. Class sessions will include activities such as open-ended discussions of visual art, music, and poetry; sketching; mask-making; storytelling; and reflective writing. Each week of the course will center on a core theme: 1) family/community, 2) work/education, and 3) self-care. No art knowledge or experience of any kind is required.

Please note: Prior to enrolling voluntarily in this elective, students will be advised that course participation includes taking part in an IRB-approved research study. Each student will be expected to submit four 750-word+ written reflections over the duration of the course (one baseline, two formative, and one summative reflection), both to assess whether course objectives were met and to answer the study's research questions.

**Course Objectives:** -Facilitate deepened student reflection on what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients)

-Facilitate student reflection on one's sense of self in relation to one's family, community, work, and education experiences

-Facilitate student reflection on how family, community, education, and work experiences offer opportunities for improving one's life satisfaction and happiness, physical and mental health, character, and virtue, meaning and purpose, and close social relationships

-Facilitate student reflection on the role of the arts and humanities in mastering skills, appreciating multiple perspectives, gaining personal insight, and supporting social advocacy

-Facilitate student reflection on how the arts and humanities can support self-care and wellbeing.

#### **THE ONLINE ART MUSEUM: EXPLORING PROFESSIONAL IDENTITY THROUGH ART**

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Margaret Chisolm, [mchisol1@jhmi.edu](mailto:mchisol1@jhmi.edu)

**Faculty:** Dr. Margaret Chisolm

**Availability/Duration:** 1 week elective- 2/22/2021-2/26/2021

**Prerequisite(s):** N/A

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course will use visual arts-based teaching methods to facilitate reflection on professional identity. The most used and best studied of these arts-based methods, Visual Thinking Strategies, was developed by former Museum of Modern Art education director, Philip Yenawine, who has graciously agreed to be one of the small group facilitators for the course. The course builds on what you have learned in the College Advisory Program TIME Small Group Teaching Sessions about your sense of self and professional identity. What you learn here will prepare you to thrive personally and professionally during your training and throughout your career. You will engage in interactive online sessions and discussions centered on activities using online collections of art. Other activities will also include music, poetry, sketching, and reflective writing. Topic will include what it means to be human, to be a



physician, and to lead a good life (for oneself and one's patients), and self-care. No art knowledge or experience of any kind is required.

Course Objectives: - Facilitate student reflection on what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients)

-Facilitate student reflection on the role of the arts and humanities in developing clinically relevant skills (e.g., observation, communication, clinical reasoning, empathy, appreciation of multiple perspectives, and tolerance for ambiguity)

-Facilitate student reflection on how the arts and humanities can support self-care and wellbeing.

### EXPLORING PROFESSIONAL IDENTITY THROUGH ART: AN ONLINE ART MUSEUM-BASED ELECTIVE

**Course Type:** Other

**Department/Division:** Psychiatry and Behavioral Sciences and Medicine

**Course Director:** Dr. Margaret Chisolm, [mchisol1@jhmi.edu](mailto:mchisol1@jhmi.edu)

**Faculty:** Dr. Margaret Chisolm, Dr. Heather Kagan, and Dr. Bonnie Marr with guest facilitation by Katie Stouffer and museum educator Philip Yenawine

**Availability/Duration:** This course is available to any 2nd, 3rd, or 4th year JHUSOM student. Enrollment is limited to 15 students, and the course will be offered if at least 5 students enroll. Course will be offered 2/22/21-2/26/21 and 5/3/21-5/7/21.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course will use the arts and humanities to facilitate reflection on professional identity. The most used and best studied of these arts-based methods, Visual Thinking Strategies, was developed by former Museum of Modern Art education director, Philip Yenawine, who has graciously agreed to be one of the small group facilitators for the course. The course builds on what you have learned in the College Advisory Program TIME Small Group Teaching Sessions about your sense of self and professional identity. What you learn here will prepare you to thrive personally and professionally during your training and throughout your career. You will engage in interactive online sessions and discussions centered on activities using online collections of art. Other activities will also include music, poetry, sketching, and reflective writing. Topic will include what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients), and self-care. No art knowledge or experience of any kind is required.

Please note: Prior to enrolling voluntarily in this elective, students will be advised that course participation includes taking part in an IRB-approved research study (IRB00210522; Principal Investigator Margaret Chisolm MD). Each student will be expected to submit two 750-word+ written reflections over the duration of the course (one baseline and one summative reflection) and a pre- and post-course survey to assess whether course objectives were met and to answer the study's research questions.

**Course Objectives:** - Facilitate student reflection on what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients)

- Facilitate student reflection on the role of the arts and humanities in developing clinically relevant skills (e.g., observation, communication, clinical reasoning, empathy, appreciation of multiple perspectives, and tolerance for ambiguity)

- Facilitate student reflection on how the arts and humanities can support self-care and wellbeing

### THE HOSPITAL

Course Type: Other

Department/Division: Interdepartmental

**Course Director:** Dr. Amit Pahwa [pahwa@jhu.edu](mailto:pahwa@jhu.edu) or 410-502-1934

Faculty: Dr. Amith Pahwa

**Availability/Duration:** All year; two weeks. Limited to one student.

Prerequisite(s): None



Drop Period: 1 month

**Description:** As a physician, and especially an intern, you will depend on a host of providers in order to efficiently care for your patients, from nurses and social workers to pharmacists and occupational therapists. An understanding of how these staff function in the hospital can help make you a more efficient (and happy) intern. An excellent complement to the Transition to Internship course (TRIPLE), *The Hospital* is a two-week immersion in the world of non-physician patient care. You will spend one day each “walking in the shoes of” various non-physician providers, under the individual guidance of expert preceptors from each field. The disciplines included are nursing, social work; case management; hospital administration; infection control; pharmacy, and rehabilitation (PT, OT, and speech pathology), home care, palliative care, respiratory therapy, nutrition, hospital administration, and infection control. A pioneering venture in interdisciplinary learning, *The Hospital* will help you become a better leader and collaborator as an intern, resident, and attending physician. Grading is pass/fail and will be determined by attendance and completion of a short essay.

## RESEARCH OPPORTUNITIES

### CARDIOLOGY DIVISION

DR. S. ACHUFF

Clinical cardiology

DR. A. ARBAB-ZADEH

Coronary circulation and disease; coronary/cardiac imaging; coronary risk prediction

DR. H. ASHIKAGA

Cardiac arrhythmias; cardiology; electrophysiology

DR. T. AVERSANO

Arrhythmia; cardiology; cardiomyopathy; cardiovascular disease; clinical cardiology; coronary artery disease; general cardiology; heart disease; heart failure; hypertension; invasive cardiology; irregular heartbeat; preventive medicine

DR. S. BANSAL

Cardiac arrhythmias; cardiology; electrophysiology

DR. R. BERGER

Cardiac electrophysiology; hemodynamics of cardiac pacing; autonomic influences on cardiovascular system

DR. S. BERKOWITZ

Cardiology

DR. R. BHATIA

Cardiology

DR. M. BLAHA

Cardiology; preventative cardiology

DR. R. BLUMENTHAL

Atherosclerosis progression and regression; medical and interventional management of coronary artery disease

DR. M. BRENNAN

Cardiology; cardiovascular disease; clinical cardiology; echocardiography; heart failure; hypertension; valvular disease

DR. J. A. BRINKER

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MEDICINE

Angiography; angioplasty; myocardial function

DR. H. CALKINS

Clinical and cellular electrophysiology

DR. A. CAMMARATO

Basic investigation in molecular contractile physiology

DR. M. CHACKO

Coronary artery disease, peripheral arterial disease; carotid artery disease valvular heart disease; structural heart disease; acute coronary syndromes; stents; cardiac critical care

DR. N. CHANDRA-STROBOS

Cardiopulmonary resuscitation

DR. O. CINGOLANI

Heart failure; hypertension; cardiac remodeling and hypertrophy

DR. M. CORRETTI

Ultrasound assessment of endothelial function/vascular physiology; echocardiography; valve disease

DR. S. DESAI

Cardiology; cardiovascular disease; heart disease

DR. R. GEORGE

Cardiovascular CT; nuclear cardiology; myocardial perfusion imaging; non-invasive imaging of coronary atherosclerosis; subclinical atherosclerosis

DR. G. GERSTENBLITH

Age changes in cardiac function

DR. S.H. GOTTLIEB

Ischemic heart disease; diabetes and heart disease

DR. L. GRIFFITH

Clinical cardiology

DR. T. HAILU

Cardiology; echocardiography and nuclear cardiology; heart disease; nuclear stress tests; transesophageal echocardiography

DR. H. R. HALPERIN

Biomedical engineering and biomechanics; electrophysiology

DR. A. HAYS

Cardiac MR; proton spectroscopy; coronary endothelial function; diabetic cardiomyopathy; echocardiography

DR. C. HWANG

Acute coronary care; percutaneous coronary intervention; percutaneous treatment of valvular stenosis; pericardiocentesis; peripheral angiography; trans-radial intervention

DR. P. JOHNSTON

Stem cell therapy; interventional cardiology; coronary disease

DR. S. JONES

Lipids and cardiovascular risk stratification

DR. D. JUDGE

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MEDICINE

Pathogenesis of Marfan Syndrome; identification of genes responsible for familial cardiomyopathies

DR. E. KASPER

Cardiomyopathy; heart transplantation; clinical cardiology

DR. D. A. KASS

Hemodynamics; left ventricular function

DR. M. KELEMEN

Exercise

DR. A. KOLANDAIVELU

MR imaging of intermingled arrhythmic and non-arrhythmic heartbeats

DR. B. KRAL

Genetic and biological mechanisms of premature coronary artery disease; noninvasive imaging of coronary atherosclerosis; stress myocardial perfusion imaging; cardiovascular and genetic epidemiology; association of mental stress and cardiovascular disease

DR. C. KWON

Basic investigation in cardiovascular development

DR. E. G. LAKATTA

Age and the cardiovascular system

DR. J. LIMA

Left ventricular remodeling; mitral valve disease; transesophageal echocardiography; MRI; CT

DR. J. MARINE

Electrophysiology

DR. S. MAYER

Echocardiography

DR. E. MICHOS

Preventive cardiology; heart disease in women; subclinical atherosclerosis imaging; vitamin D deficiency and cardiovascular risk

DR. J. MILLER

Acute coronary syndromes; antiplatelet and antithrombotic therapy; microvascular obstruction; multidetector computed tomography angiography; novel therapies for myocardial infarction; angiogenesis; peripheral vascular disease; novel therapies for peripheral vascular disease; claudication; angiogenesis

DR. M. MUKHERJEE

Acute coronary care; coronary artery disease; general cardiology; cardiovascular diseases; echocardiography; heart disease prevention and treatment in women, hypertension, non-invasive imaging; pulmonary hypertension

DR. S. NAZARIAN

Clinical electrophysiology

DR. C. NDUMELE

Acute coronary care; coronary artery disease; coronary care unit; dyslipidemia; high cholesterol; ischemic heart disease; preventive cardiology; risk factor modification

DR. B. O'ROURKE

Cellular physiology; mitochondrial metabolism

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MEDICINE

DR. P. OUYANG  
Cardiovascular pharmacology

DR. J. PORTERFIELD  
General cardiology; echocardiography

DR. W. POST  
Echocardiography and hypertension

DR. E. RATCHFORD  
Claudication/peripheral arterial disease; carotid stenosis

DR. J. RESAR  
Interventional cardiology

DR. J. RICKARD  
Electrophysiology

DR. R. ROUF  
Heart failure

DR. S. RUSSELL  
Heart failure; cardiac transplantation

DR. M. SALAMEH  
Vascular disease and diagnostics

DR. S. SCHULMAN  
Clinical trials; hypertension

DR. E. P. SHAPIRO  
Echocardiography

DR. H. SILBER  
Acute coronary care; MRI

DR. S. SINHA  
Clinical electrophysiology

DR. D. SPRAGG  
Clinical electrophysiology

DR. K. STEWART  
Exercise training for cardiovascular disease and heart failure; exercise training for diabetes and hypertension; weight loss effects through diet and exercise on body composition and CV health; exercise for cancer patients; increasing physical activity in the community

DR. N. STRAHAN  
Echocardiography

DR. H. TANDRI  
Clinical electrophysiology

DR. J. TANIO  
Clinical cardiology

DR. R. TEDFORD

Cardiac transplant; cardiology; cardiomyopathy; congestive heart failure; endomyocardial biopsy; heart failure; right heart catheterization; mechanical circulatory support

DR. D. THIEMANN

Information systems; angioplasty

DR. G. TOMASELLI

Cellular electrophysiology

DR. T. A. TRAILL

Regional cardiac function; congenital heart disease

DR. J. WEISS

Ultrasound imaging; ventricular function

DR. C. VALDIVIEZO-SCHLOMP

Cardiology; cardiovascular disease; cardiovascular disease in women; heart disease; heart disease prevention and treatment in women; non-invasive imaging; preventive cardiology

DR. G. WALFORD

Cardiology; cardiovascular disease; heart disease

DR. R. WEISS

Cardiac metabolism; NMR

DR. M. WILLIAMS

Platelets and acute coronary syndromes

DR. S. WILLIAMS

Cardiology; cardiovascular disease; heart disease

DR. I. WITTSTEIN

Heart failure; clinical trials

DR. K. WU

Echocardiography; MRI

DR. S. ZAKARIA

Cardiac disease; cardiology; cardiovascular disease; cardiovascular medicine; critical care medicine; heart disease

DR. R. ZIEGELSTEIN

Clinical cardiology; depression and its effects on cardiac diseases

## **ENDOCRINOLOGY DIVISION**

DR. D. BALL

Medullary thyroid carcinoma; multiple endocrine neoplasia; regulation of calcitonin gene expression

DR. T. BROWN

Endocrine problems in HIV; diabetes mellitus; osteoporosis; hypogonadism

DR. A. DOBS

Hyperlipidemia and diabetes mellitus; gonadal disorders

DR. T. DONNER

Diabetes mellitus

DR. S. GOLDEN  
Cardiology and diabetes

DR. S. JAN DE BEUR  
Metabolic bone disorders

DR. R. KALYANI  
Diabetes mellitus

DR. P. W. LADENSON  
Thyroid disorders; thyroid hormone therapy; endocrine health economic analysis

DR. J. MAMMEN  
Thyroid disorders

DR. N. MATHIOUDAKIS  
Diabetes mellitus

DR. K. MOSELEY  
Metabolic bone disorders

DR. R. SALVATORI  
Neuroendocrine and pituitary disorders

DR. D. SELLMEYER  
Metabolic bone disorders

DR. G. S. WAND  
Neuroendocrine and pituitary disease; cellular mechanisms of addiction

DR. M. XING  
Thyroid cancer; pituitary disorders

#### **GASTROENTEROLOGY DIVISION**

DR. J. ABRAHAM  
Delivery of radioisotope to cancer cells by novel small peptides

DR. S. BRANT  
Ulcerative colitis; genetics of inflammatory bowel disease; Crohn's disease

DR. M. CANTO  
Therapeutic endoscopy; endoscopic ultrasonography, Barrett's esophagus; outcomes research in endoscopy.

DR. S. CHAKRAVARTI  
Extracellular matrix changes in inflammatory bowel disease; gene expression profiling DNA microarray techniques

DR. J. CLARK  
Swallowing disorders; esophageal disorders; gastroesophageal reflux disease; eosinophilic esophagitis; motility disorders

DR. M. DONOWITZ  
Diarrheal diseases; inflammatory bowel disease

DR. F. GIARDIELLO

Colon cancer; polyps and colon cancer risk assessment

DR. M. GOGGINS

Molecular biology of pancreatic cancer

DR. J. HAMILTON

Acute and chronic viral, alcoholic, nonalcoholic, autoimmune, cholestatic, and drug-induced liver disease

DR. S. HUTFLESS

Inflammatory bowel disease epidemiology

DR. A. KALLOO

Therapeutic endoscopy; pancreatitis; sphincter of Oddi motility disorders

DR. M. KHASHAB

Pancreatitis; pancreatic cyst; endoscopic ultrasound; ERCP

DR. O. KOVBASNJUK

Ion transport properties of ionophores in artificial bilayer lipid membranes; analytical and quantitative optical microscopy; quantitative fluorescence microscopy

DR. L. LEE

GI and liver complications following bone marrow transplantation; molecular genetics of hepatocellular carcinoma; transcriptional regulation of the c-Myc oncoprotein

DR. A. LENNON

Pancreatitis; pancreatic cyst; endoscopic ultrasound; ERCP

DR. X. LI

Regulation of Na-H<sub>2</sub> channels by lipid RAFTS; IBD research

DR. Z. LI

Nutritional effects on hepatic innate immune system and their roles in liver injury and regeneration

DR. S. MELTZER

Gastrointestinal cancer and precancer biomarker discovery; development and validation, genomics, epigenomics, and bioinformatics; early detection of cancer; outcomes research in cancer and precancer

DR. E. MEZEY

Alcoholic liver disease and fibrosis; liver transplantation

DR. Y. MORI

Identification and characterization of novel tumor suppressor genes in gastric and colon cancers utilizing systematic genome-wide genetic and epigenetic screening methods; mismatch-repair deficiency-associated cancers including HNPCC

DR. G. MULLIN

The role of early intervention of nutritional support in the hospitalized setting to improve outcomes

DR. J. POTTER

Effect of ethanol and its metabolites on the  $\alpha_2(I)$  and  $\alpha_1(I)$  collagen promoters; role of leptin on fibrogenesis; role of Kupffer cells, cytokines, retinoic acid, and leptin in stellate cell activation (transdifferentiation) and collagen production; hormonal regulation of rat class I alcohol dehydrogenase; transcriptional regulation of rat class I alcohol dehydrogenase promoter

DR. R. SARKER

Signaling pathway of human intestinal Na<sup>+</sup>/H<sup>+</sup> exchanger 2 (NHE3) regulation; transactivation of NHE3; knock-down NHE3 regulatory proteins by shRNA

DR. V. SINGH

Acute and chronic pancreatitis; therapeutic endoscopy; resource utilization and cost effectiveness in pancreaticobiliary disease

DR. E. STEIN

Motility of GI tract; swallowing disorder; esophageal disorders; gastroesophageal reflux disease; eosinophilic esophagitis; gastroparesis; GI motility disorders

DR. C. M. TSE

Function and regulation of sodium/hydrogen exchange-2 isoform; molecular biology of nucleoside transporters; roles in nutrient and drug absorption

DR. N. ZACHOS

Regulation of intestinal ion transport by protein trafficking and multi-protein complexes; intracellular calcium signaling; cell-penetrating peptides as therapy for acute diarrhea

### GERIATRIC MEDICINE DIVISION

DR. P. ABADIR

Basic research mitochondria/frailty

DR. A. ARBAJE

Health services research on care transition

DR. J. BARRON

Primary care of older adults

DR. M. BELLANTONI

Osteoporosis; post-acute care

DR. C. BOYD

Primary care; research on multimorbidity

DR. J. R. BURTON

Primary care; continence evaluations; geriatrics education

DR. D. CAYEA

Primary care; educational outcomes research

DR. C. CHRISTMAS

Primary care; educational outcomes research

DR. J. COLBURN

Outpatient geriatric primary care

DR. P. COLVIN

Hip fracture geriatrics co-management service

DR. S. DURSO

Community-based geriatrics; consultation for complex medical illness

DR. N. FEDARKO

Bone metabolism; tumor progression



DR. J. FINKELSTEIN  
Chronic disease informatics program

DR. T. FINUCANE  
Primary care; post-acute care; ethical issues regarding health care decisions

DR. J. HAYASHI  
House calls

DR. B. LEFF  
Primary care; new approaches to treating elderly patients at home

DR. S. LENG  
Post-acute care; molecular biology of aging and frailty

DR. M. MCNABNEY  
Health care delivery in a capitated model; community-based long-term care

DR. E. OH  
Clinical dementia care; biomarkers for Alzheimer's disease research

DR. R. VARADHAN  
Mathematical modeling of multisystem dysregulation in frailty

DR. J. WALSTON  
Post-acute care; genetics and clinical research applications to diabetes in the elderly

DR. Q. XUE  
Biostatistical models of frailty

DR. S. YASAR  
Dementia; clinical care and research  
[HEMATOLOGY DIVISION](#)

DR. R. BRODSKY  
Bone marrow failure disorder

DR. J. GERBER  
Leukemic stem cell biology

DR. T. S. KICKLER  
Immunohematology

DR. S. LANZKRON  
Anemias and other bleeding disorders, with emphasis on sickle cell disorders

DR. M. MCDEVITT  
Myeloproliferative and myelodysplastic disorders

DR. A. MERCHANT  
Cancer stem cells

DR. A. MOLITERNO  
Polycythemia Vera

DR. P. NESS  
Transfusion practices

DR. S. SHANBHAG  
General hematology and lymphoproliferative disorders

DR. M. STREIFF  
Hemorrhagic and thrombotic disorders

#### ALLERGY & CLINICAL IMMUNOLOGY DIVISION

DR. D. AKINYEMI  
Outcomes in drug allergy

DR. K. BARNES  
The genetic epidemiology and molecular genetics/genomics of complex lung inflammatory diseases

DR. B. CANNING  
Innervation of the airways

DR. L. GAO  
Genetic epidemiology and functional genomics of complex lung disease

DR. P. GAO  
Molecular genetics of asthma

DR. R. HAMILTON  
Humoral immune responses in allergic disease

DR. N. HANSEL  
Genetic and environmental determinants of obstructive airway disease

DR. M. KOLLARIK  
Influence of inflammation on the visceral nervous system

DR. D. W. MACGLASHAN, JR.  
Mechanisms of signal transduction

DR. R. MATHIAS  
Genetics of asthma, allergy, and cardiovascular disease

DR. A. MYERS  
Airway inflammation and neurobiology

DR. S. SAINI  
Mast cell and basophil biology in allergic disease

DR. J. SCHROEDER  
Innate vs adaptive immunity in regulating cellular responses

DR. J. TVERSKY  
Dendritic cells and immunotherapy

DR. B. J. UNDEM  
Nerve inflammation interactions

DR. B. VONAKIS  
Epithelial cell biology and eicosanoid receptors

DR. Z. ZHU  
Transgenic mouse models of asthma  
[INFECTIOUS DISEASES DIVISION](#)

DR. A. ANDRADE  
HIV clinical trials

DR. P. AUWAERTER  
Lyme disease; general ID clinical care

DR. R. AVERY  
Transplant and oncology infectious diseases

DR. A. BALAGOPAL  
HIV/HCV pathogenesis

DR. J. G. BARTLETT  
Anaerobic infections; antibiotic-associated diarrhea and colitis; HIV/AIDS

DR. S. BERRY  
HIV health outcomes

DR. W. BISHAI  
Tuberculosis

DR. J. BLANKSON  
HIV pathogenesis

DR. R. BOLLINGER  
Host defense in HIV; tropical infections

DR. R. CHAISSON  
Mycobacterial infections; HIV/AIDS

DR. L. CHANG  
International HIV

DR. S. COSGROVE  
Infection control and antibiotic control

DR. A. COX  
Pathogenesis of Hepatitis C

DR. S. DORMAN  
TB and atypical mycobacteria

DR. C. FLEXNER  
AIDS; clinical pharmacology

DR. J. GALLANT  
Epidemiology of HIV

DR. C. GAYDOS

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MEDICINE

Chlamydia pneumonia and STDs

DR. K. GEBO  
HCV and HIV databases

DR. K. GHANEM  
Sexually transmitted infections

DR. D. GRIFFIN  
Pathogenesis of viral infections of the central nervous system

DR. A. GUPTA  
HIV and co-morbidities management research in resource-limited settings

DR. C. HOFFMAN  
International HIV

DR. N. HYNES  
STD's; tropical medicine

DR. P. KARAKOUSIS  
Tuberculosis

DR. G. KIRK  
HCV Epidemiology

DR. J. KERULY  
Epidemiology and service utilization in HIV management

DR. G. LUCAS  
HIV and substance abuse

DR. L. MARAGAKIS  
Infection control

DR. K. MARR  
Transplant and oncology infectious diseases

DR. R. MCKENZIE  
Travel medicine; HIV

DR. M. MELIA  
ID and HIV clinical care

DR. R. MOORE  
HIV clinical cohort studies

DR. E. NUERMBERGER  
TB and pneumonia

DR. W. OSBURN  
Neutralizing antibody responses in HCV infection; role of CCR5 in clearance of HBV

DR. T. PERL  
Hospital infection control

DR. T. C. QUINN

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MEDICINE

Sexually transmitted diseases; chlamydia; AIDS

DR. S. RAY  
Hepatitis C virology

DR. A. ROMPALO  
Sexually transmitted diseases

DR. C. SEARS  
Mechanisms of diarrhea

DR. M. SHAH  
TB diagnostics

DR. S. SHOHAM  
Transplant and oncology infectious diseases

DR. J. SILICIANO  
Pharmacodynamics of HIV-1 drugs; mechanisms of viral persistence

DR. R. SILICIANO  
Pharmacodynamics of HIV-1 drugs; mechanisms of viral persistence

DR. M. SULKOWSKI  
Hepatitis

DR. C. THIO  
Viral Hepatitis

DR. D. THOMAS  
Hepatitis

DR. J. ZENILMAN  
Sexually transmitted diseases; H. simplex; HIV

#### **GENERAL INTERNAL MEDICINE DIVISION**

DR. A. ALVANZO  
Substance use disorders and posttraumatic stress with emphasis on relationship between physical, sexual, and/or emotional abuse and substance abuse in women; race/ethnicity and sex differences in substance use disorders; screening and brief interventions for substance misuse

DR. L. APPEL  
Prevention of blood pressure-related cardiovascular and kidney diseases through pharmacologic and non-pharmacologic approaches, often nutrition-based

DR. B. ASHAR  
Dietary supplements; disease prevention; complementary and alternative medicine; physician conflicts of interest; anemia; medical education

DR. E. BASS  
Evidence-based medicine; medical and surgical outcomes research; cost-effectiveness; community health partnerships; medical education and curriculum development

DR. M. BEACH

Physician-patient relationships and communication, respect, bioethics, health care quality for vulnerable populations; HIV; sickle-cell disease.

DR. D. M. BECKER

Genetics/epidemiology of premature cardiovascular disease (CVD); molecular and physiologic aspects of CVD risk; community-based CVD prevention; social/behavioral science; health disparities

DR. W. BENNETT

Women's health; diabetes and obesity

DR. Z. BERGER

Patient-provider communication; bioethics; clinical epidemiology; the primary care physician's role in cancer control

DR. G. BERKENBLIT

Improving resident training in HIV outpatient care; design and evaluation of an internet-based curriculum

DR. R. BOONYASAI

Care coordination at hospital discharge; teamwork; quality improvement for chronic disease; hypertension

DR. L. BOULWARE

Quality and access to care in chronic kidney disease; organ donation; racial and ethnic disparities

DR. D. BROTMAN

Hospital medicine; perioperative medicine; hemostasis and thrombosis; the physiological stress response

DR. R. BROWN

Obesity

DR. G. CHANDER

Clinical epidemiology of HIV/AIDS and hepatitis C

DR. J. CLARK

Obesity, diabetes, and related conditions including nonalcoholic fatty liver disease (NAFLD)

DR. S. CLEVER

Patient-physician communication; medical education

DR. J. COFRANCESCO

Medical education; HIV care and antiretroviral management; HIV lipodystrophy and metabolic complications

DR. L. COOPER

Patient-physician relationship and communication; patient-centered care; race/ethnic disparities

MS. A. DALCIN

Obesity; prevention and treatment of cardiovascular disease; health disparities

DR. G. DAUMIT

Medical comorbidity; access to and quality of primary medical care for individuals with severe and persistent medical illness; health disparities

DR. L. FELDMAN

Resident education; evidence-based medicine; consult medicine

DR. A. FITZGERALD

Medical education; leadership skills training; primary care; Johns Hopkins Medicine International patient care; health care disparities education

DR. L. FLOREA

Algorithms and tools for cDNA and genomic sequence alignment; comparative and evolutionary genomics; gene annotation; alternative splicing and its regulation; miRNA genomics; peptide-based vaccine design

DR. J. FLYNN

Arthritis; ambulatory education and the delivery of primary care in an academic setting

DR. D. FORD

Primary care research; epidemiology and treatment of depression; internet health applications; physician health

DR. G. GELLER

Communication and decision-making; ethics and professionalism; genetics; women's health; medical education; complementary and alternative medicine

DR. M. GOYAL

Effects of meditation on chronic pain and symptoms; stress and overall health; low-cost means to improve health in rural India; ethics

DR. R. GREER

Chronic kidney disease; primary care; ethnic/race disparities

DR. K. GUDZUNE

Obesity; patient-physician communication; social networks

DR. C. HERZKE

Resident and student education; infectious diseases-notably infection control; quality improvement

DR. F. HILL-BRIGGS

Chronic disease self-management; disability; behavioral intervention trials; health disparities; functional impairment and disability

DR. M. HUGHES

Clinical bioethics; research ethics; palliative care; philosophy of medicine; ambulatory care

DR. M. LAZO

Nonalcoholic fatty liver disease; diabetes; epidemiologic studies

DR. D. LEVINE

Community-based prevention of cardiovascular disease; behavioral aspects of prevention

DR. H. LEVY

General internal medicine; genetics

MR. D. LICHTMAN

Medical procedures; hospitalist medicine

DR. S. MARINOPOULOS

Evidence-based medicine; health care administration

DR. M. MARKOWSKI

Anti-inflammatory agents and cancer incidence; prostate cancer; men's health; hospitalist medicine

DR. N. MARUTHUR

Primary care; individualized medicine for the prevention and treatment of type 2 diabetes and obesity; pharmacogenomics of type 2 diabetes; comparative effectiveness

DR. H. MICHTALIK

Quality improvement and systems management; patient safety issues especially as related to patient census; transitions of care from acute to primary care

DR. E. MILLER

Hypertension; clinical trials; non-pharmacologic therapies; antioxidants.

DR. R. MILLER

Women's health; physician practice issues; medical education

DR. A. MONROE

Cardiovascular disease risk reduction in HIV-infected patients; optimizing care of HIV-infected patients with medical comorbidities

DR. R. D. MOORE

Pharmacoepidemiology; outcomes research in HIV treatment; epidemiology of substance abuse and alcoholism

DR. T. NIESSEN

Medical education; patient safety; quality improvement

DR. A. PAHWA

Hospitalist medicine

DR. K. PEAIRS

Cancer survivorship and screening; medical education

DR. M. PERTEA

Computational gene finding; splice site prediction; sequence motif finding

DR. G. PROKOPOWICZ

General internal medicine; medical informatics; hypertension

DR. R. QAYYUM

Platelet biology; hemostasis and thrombosis; pharmacogenomics of anti-platelet agents; genetic epidemiology; systematic reviews; meta-analysis

DR. P. RANASINGHE

Internal and preventive medicine; international health; health and wellness

DR. K. ROBINSON

Evidence-based health care; health informatics

DR. S. SALZBERG

Genomics; bioinformatics; gene finding; genome assembly; genome technology

DR. J. SEGAL

Pharmacoepidemiology; comparative effectiveness research including evidence-based review; advanced methods for using observational data; evaluation of diagnostic tests; diabetes; venous thrombosis and blood disorders.

DR. Z. SIDDIQUI

Clinical reasoning; preoperative medicine; international medicine

DR. S. SINGH

Pharmacoepidemiology; drug safety; comparative effectiveness; health equality

DR. S. SISSON

Ambulatory medicine; medical education; community outreach



DR. C. SNYDER

Quality of life for cancer patients undergoing treatment; coordination of care for cancer survivors; patient-reported outcomes assessment; quality of medical care; cancer outcomes and health services research

DR. R. STEWART

Medical education; preventive medicine; health outcomes; community outreach

DR. J. SUGARMAN

Philosophical and empirical research in biomedical ethics

MS. L. SWARTZ

Project management; multi-center randomized controlled trials

DR. D. VAIDYA

Mechanisms of vascular dysfunction; assessment of cardiovascular risk factors

DR. N. WANG

Longitudinal data analysis; statistical and epidemiologic methods; randomized controlled trials; multicenter studies

DR. L.D. WOOSTER

Healthcare management; quality clinical outcomes; preventive care in pulmonary diseases; medical economics; medical education integrated into clinical practice

MS. L. YANEK

Cardiovascular disease in families and risk factor modification

DR. H. YEH

Epidemiology; diabetes; obesity; cancer; lung functions

DR. J. YOUNG

Genetic epidemiology; novel risk factors for CVD; hypertension; insulin resistance

#### **OCCUPATIONAL & ENVIRONMENTAL MEDICINE**

DR. E. BERNACKI

Occupational epidemiology; cumulative trauma disorders

DR. B. SCHWARTZ

Lyme disease; occupational epidemiology

DR. P. STRICKLAND

Biomarkers of genotoxicity; biomarkers of PAH exposure and susceptibility

DR. X. TAO

Occupational epidemiology

#### **CLINICAL PHARMACOLOGY DIVISION**

DR. K. DOOLEY

Anti-tuberculosis drugs; co-treatment of HIV and tuberculosis

DR. C. FLEXNER

Anti-HIV- drugs; drug metabolism and transport; mechanisms of drug action and toxicity

DR. C. HENDRIX  
Microbicide prophylaxis

DR. B. PETTY  
Clinical pharmacology; Phase I, II studies

DR. T. SHAPIRO  
Antiparasitic chemotherapy

#### **NEPHROLOGY DIVISION**

DR. M. ATTA  
HIV kidney disease; acute kidney disease; metabolic bone disease; hypertension

DR. M. CHOI  
Electrolyte disorders; nephrolithiasis; glomerular disease

DR. M. ESTRELLA  
HIV; Diabetic nephropathy

DR. D. FINE  
SLE; HIV; glomerular kidney disease; toxin related kidney disease

DR. P. SCHEEL  
Dialysis vascular access; dialysis; retroperitoneal fibrosis; acute kidney injury

DR. C. SPERATI  
Hypertension; glomerular disease; electrolyte disorders

DR. S. TURBAN  
Chronic kidney disease; hypertension

DR. T. WATNICK  
Genetic diseases of the kidney

#### **PULMONARY & CRITICAL CARE MEDICINE DIVISION**

DR. N. AGGARWAL  
Acute lung injury; gene expression

DR. R. AURORA  
Sleep medicine

DR. S. BOSE  
Chronic obstructive pulmonary disease; asthma; vitamin D deficiency

DR. M. BOYLE  
Adult cystic fibrosis; clinical cystic fibrosis research

DR. R. BROWER  
Critical care medicine; adult respiratory distress syndrome

DR. W. CHECKLEY  
Critical care; acute lung injury; international clinical trials

DR. F. D'ALESSIO

Acute lung injury resolution

DR. M. DAMARLA

Endothelial barrier dysfunction; MAP Kinase signaling in apoptosis-induced ventilator-associated lung injury

DR. R. DAMICO

Endothelial cell apoptosis; LPS-induced acute lung injury

DR. S. DANOFF

Transcription genes, neuronal development, BAP135 protein; interstitial lung disease

DR. E. DAUGHERTY

Infection prevention in the ICU; critical care during epidemics

DR. G. DIETTE

Asthma outcomes; quality of care, quality improvement

DR. D. FELLER-KOPMAN

Interventional pulmonology

DR. H. FESSLER

Cardiopulmonary interactions; intensive care

Dr. B. GARIBALDI

Idiopathic pulmonary fibrosis; interstitial lung disease

DR. D. HAGER

Critical care medicine; catastrophic event preparedness and response

DR. P. HASSOUN

Pulmonary hypertension; xanthine oxidoreductase in acute lung injury

DR. M. HORTON

Interstitial lung disease; idiopathic pulmonary fibrosis; extra cellular matrix; chemokines

DR. J. JUN

Sleep medicine; obstructive sleep apnea

DR. B. KIM

Pulmonary hypertension; xanthine oxidoreductase in acute lung injury

DR. L. KING

Acute lung injury; critical care; epithelial cell biology

DR. J. KIRKNESS

Sleep disordered breathing

DR. T. KOLB

Pulmonary arterial hypertension; vascular remodeling; acute lung injury

DR. N. LECHTZIN

Neuromuscular disease; cystic fibrosis

DR. M. LIU

Studies of asthma and pathogenesis and therapy

DR. S. MATHAI

Pulmonary hypertension; scleroderma in pulmonary hypertension

DR. M. MCCORMACK

Asthma; COPD; environmental impacts on airway disease

DR. C. MERLO

Cystic fibrosis epidemiology; lung transplant

DR. D. MOLLER

Sarcoidosis; Molecular and cellular immunology of lung diseases; mechanisms of T-cell activation

DR. D. NEEDHAM

Critical care medicine; ventilator-induced lung injury outcomes

DR. E. NEPTUNE

Receptor signaling; neutrophils

DR. J. ORENS

Lung transplantation; emphysema; lung volume reduction surgery; exercise physiology

DR. S. PATIL

Neuromodulation of upper airway obstruction during sleep; testing of sleep apnea treatment devices

DR. D. PEARSE

Ischemia reperfusion lung injury; airway smooth muscle hyper-responsiveness

DR. V. POLOTSKY

Cardiorespiratory abnormalities in obesity and sleep disorders

DR. N. PUNJABI

Clinical epidemiology; pulmonary and sleep medicine

DR. C. RAND

Behavioral pulmonology; patient compliance in asthma treatment; smoking cessation

DR. K. REIKERT

Asthma disparities; cystic fibrosis

DR. H. SCHNEIDER

Sleep disordered breathing

DR. A. R. SCHWARTZ

Respiratory and upper airway physiology; sleep apnea

DR. J. SHAM

Electrophysiology and calcium homeostasis in pulmonary and cardiac myocytes and smooth muscle transport

DR. L. SHIMODA

Pulmonary vascular biology; oxidative stress; endothelial cell signaling

DR. R. SIDHAYE

Aquaporins in the lung; epithelial cell biology; acute lung injury

DR. L. SILHAN

Lung transplantation; interstitial lung disease

DR. P. L. SMITH  
Sleep disordered breathing

DR. P. SOSNAY  
Adult cystic fibrosis; genomics

DR. J. T. SYLVESTER  
Pulmonary vascular biology; medical intensive care

DR. P. B. TERRY  
Pulmonary physiology; medical ethics

DR. E. WAGNER  
Angiogenesis in the lung; bronchial vascular proliferation and function

DR. J. WANG  
Calcium pathways in hypoxic pulmonary hypertension

DR. R. A. WISE  
Cardiopulmonary physiology; autoimmune pulmonary disease; chronic obstructive pulmonary disease

DR. L. YARMUS  
Interventional pulmonology

DR. R. C. YUNG  
Diagnosis of and therapy for early and advanced cancer; aerosolized cytokines

#### **RHEUMATOLOGY DIVISION**

DR. F. ANDRADE  
Mechanisms of autoimmunity

DR. A. BAER  
Evaluation and management of Sjogren's Syndrome, metabolic myopathies, and gout

DR. C. BINGHAM  
Clinical therapeutics of rheumatoid arthritis and osteoarthritis; oral health in rheumatic diseases; RA & OA clinical trial design

DR. J. BIRNBAUM  
Neurological manifestations of systemic rheumatic disease

DR. L. CASCIOLA-ROSEN  
Mechanisms of autoimmunity, especially myositis and scleroderma

DR. L. CHRISTOPHER-STINE  
Epidemiology and therapy of inflammatory myositis

DR. E. DARRAH  
Mechanisms of autoimmunity

DR. A. GELBER  
Epidemiology of arthritis and rheumatic disorders

DR. T. GRADER-BECK  
Translational research in systemic autoimmunity

DR. U. HAQUE  
Evaluation and management of inflammatory arthritis

DR. L. HUMMERS  
Epidemiology and treatment of scleroderma

DR. R. MANNO  
Epidemiology of aging and arthritis

DR. Z. MCMAHAN  
Evaluation and management of arthritis and fibromyalgia

DR. A. ROSEN  
Mechanisms of rheumatic diseases

DR. P. SEO  
Disease activity and novel therapeutics of systemic vasculitis

Dr. A. SHAH  
Epidemiology and management of scleroderma

DR. S. SULE  
Evaluation and management of pediatric rheumatology

DR. M. SOLOSKI  
T-cell immunity in infection

DR. F. WIGLEY  
Raynaud's phenomenon, scleroderma, and related disorders

## MOLECULAR BIOLOGY AND GENETICS

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ME:260.699

### FUNDAMENTALS OF GENETICS (ME:260.708)

**Course Type:** Other

**Department:** Cell Biology

**Course Director:** Dr. Erika Matunis

**Telephone Number:** 410-502-0009

**Faculty:** Biochemistry, Cell, and Molecular Biology and Genetics faculty

**Availability/Duration:** Q2; 16 lectures and exam; Tues & Thurs 9-10:30 a.m.

**Prerequisite(s):** Molecular Biology, special permission

**Drop Period:** 1 month

**Description:** This lecture course will cover fundamental principles of genetics, focusing primarily on model systems. Problem sets will be an integral learning tool in this course.

### SPECIAL STUDIES AND RESEARCH

**Course Type:** Basic Research

**Department:** Molecular Biology and Genetics

**Course Director:** As arranged

**Faculty:** All faculty in the Department of Molecular Biology and Genetics

**Availability/Duration:** As arranged

**Drop Period:** 1 month

**Description:** Opportunities to carry out special studies and research in various branches of molecular genetics, immunology, and microbiology will be made available not only to candidates for advanced degrees but also to other qualified students. Arrangements for such work must be made with individual members of the staff.

### MOLECULAR BIOLOGY AND GENOMICS (ME:260.709)

**Course Type:** Other

**Department:** Molecular Biology and Genetics

**Course Director:** Dr. Jeff Coller

**Telephone Number:** 410-614-0198

**Faculty:** Biochemistry, Cell, and Molecular Biology and Genetics faculty

**Availability/Duration:** Q2, MWF, 9-10:30 a.m.; 17 lectures and exam

**Prerequisite(s):** Courses in organic chemistry, physical chemistry, and Biochemistry B1 or its equivalent, or by special permission.

**Drop Period:** 1 month

**Description:** A lecture course dealing with the structure, physical properties, biosynthesis and degradation of nucleic acids and proteins. There will also be a focus on genetics and genetic regulatory mechanisms of bacteria and bacteriophages. The course is experimental approach-focused in an effort to train students to be analytical research scientists.

### GREAT EXPERIMENTS IN BIOLOGY

**Course Type:** Other

**Department:** Molecular Biology and Genetics

**Course Director:** Dr. Jeremy Nathans

**Telephone Number:** 410-955-4679

**Faculty:** Dr. Nathans

**Availability/Duration:** Q4; 11 lectures and exam

**Prerequisite(s):** Basic knowledge of molecular biology, genetics, cell biology, and biophysics

**Drop Period:** 1 month

**Description:** In this course, we will read approximately 30 classic papers in the biological sciences. The course aims to expose students to some of the great experiments from 1700 to the present, and the creative thinking that inspired them. Authors include Benjamin Franklin, Robert Koch, Selig Hecht, Lubert Stryer, Christine Nusslein-Volhard, Alec Jeffries, and Avram Hershko.

### RESEARCH OPPORTUNITIES

DR. LUISA COCHELLA

Transcriptional and post-transcriptional gene regulation in development

DR. JEFF COLLER

Mechanism of mRNA regulation through stability and translation

DR. BRENDAN CORMACK

Microbial pathogenesis; chromatin silencing

DR. RACHEL GREEN

Molecular mechanisms of translation; mRNA surveillance in bacteria and eukaryotes

DR. ANDREW HOLLAND

Molecular mechanisms of cell division and centrosome homeostasis

DR. JOSH MODELL

The Modell lab studies the basic mechanisms by which CRISPR-Cas9 systems protect their bacterial hosts from viruses and other foreign genetic elements.

DR. JEREMY NATHANS

Molecular biology of vision; developmental neurobiology

DR. SERGI REGOT

Single cell signaling dynamics; live cell biosensors

DR. GERALDINE SEYDOUX

Establishment of embryonic polarity and germ cell fate



## NEUROLOGY

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ME:200.699

### NEUROPATHOLOGY CONFERENCE

**Course Type:** Tutorial  
**Department/Division:** Neurology  
**Course Director:** Dr. Juan Troncoso  
**Telephone Number:** 410-955-5632  
**Faculty:** Neurology faculty  
**Availability/Duration:** By appointment  
**Prerequisite(s):** Neuropathology neurology course  
**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Students will become familiar with the principles of neuropathology and clinical pathologic correlation. Students attend weekly Brain Cutting Conference, Neurology CPC, and Neurology and Neurosurgery Grand Rounds. Opportunities for research in experimental techniques in neurobiology as applied to CNS disease are available.

### NEUROLOGY ELECTIVE

**Course Type:** Clinical Elective  
**Department/Division:** Neurology  
**Course Director:** Dr. Christopher Oakley  
**Contact:** Bernadette Clark, Course Administrator; [mclark44@jhmi.edu](mailto:mclark44@jhmi.edu) 410-502-7393  
**Faculty:** Dr. Christopher Oakley and Neurology faculty  
**Availability/Duration:** Contact course administrator; clinical elective rotations must follow the JHUSOM schedule for the Neurology Core Clerkship, **offered year-round for visiting students.**  
**Prerequisite(s):** Core Clerkships in Medicine and Neurology (if applicable)  
**Drop Period:** 1 month

**Description:** A clinical elective is offered on the adult neurology inpatient services at the Johns Hopkins Hospital or at the Johns Hopkins Bayview Medical Center. Neurology elective students must devote a minimum of four weeks to inpatient neurology during the elective.

### ADVANCED NEUROLOGY CLERKSHIP

**Course Type:** Subinternship  
**Department/Division:** Neurology  
**Course Director:** Dr. Carlos Romo  
**Contact:** Bernadette Clark, Course Administrator; [mclark44@jhmi.edu](mailto:mclark44@jhmi.edu) 410-502-7393  
**Faculty:** Dr. Christopher Oakley and Neurology faculty  
**Availability/Duration:** Contact Course Administrator; subinternship rotations must follow the JHUSOM schedule for the Neurology Core Clerkship; 4 weeks; **offered year-round (contingent upon availability) for visiting students.**  
**Prerequisite(s):** Core Clerkship in Neurology  
**Drop Period:** 1 month

**Description:** Students may choose to focus on inpatient or outpatient adult neurology and may tailor their experience to their educational needs in consultation with the course director.

### CLINICAL ELECTIVE IN PEDIATRIC NEUROLOGY

**Course Type:** Clinical Elective  
**Department/Division:** Neurology

**Course Director:** Dr. Jessica Nance

**Contact:** Bernadette Clark, Course Administrator; [mclark44@jhmi.edu](mailto:mclark44@jhmi.edu) 410-502-7393

**Faculty:** Dr. Oakley and Pediatric Neurology staff

**Availability/Duration:** Contact course administrator; clinical elective rotations must follow the JHUSOM schedule for the Neurology Core Clerkship; 4 weeks; **offered September through May (June-August contingent upon availability) for visiting students.**

**Prerequisite(s):** Core Clerkships in Neurology and Pediatrics

**Drop Period:** 1 month

**Description:** Tailored primarily for the visiting medical student, the clinical elective in Pediatric Neurology is similar in structure to the Neurology Core Clerkship. Students have the flexibility to arrange a schedule that will focus the experience toward their interests in consultation with the course director.

### SUBINTERNSHIP IN PEDIATRIC NEUROLOGY

**Course Type:** Clinical Subinternship

**Department/Division:** Neurology

**Course Director:** Dr. Jessica Nance

**Contact:** Bernadette Clark, Course Administrator; [mclark44@jhmi.edu](mailto:mclark44@jhmi.edu) 410-502-7393

**Faculty:** Dr. Oakley and Pediatric Neurology staff

**Availability/Duration:** Contact course administrator; clinical elective rotations must follow the JHUSOM schedule for the Neurology Core Clerkship; 4 weeks; **offered year-round (contingent upon availability) for visiting students.**

**Prerequisite(s):** Core Clerkships in Neurology and Pediatrics

**Drop Period:** 1 month

**Description:** A subinternship in Pediatric Neurology is offered on both inpatient and outpatient Pediatric Neurology Services.

### PRINCIPLES OF PEDIATRIC NEUROLOGY-ALL CHILDREN'S HOSPITAL

**Course Type:** Other

**Department/Division:** Pediatric Neurology, All Children's Hospital (ACH), St. Petersburg, FL

**Course Director:** Dr. Parrish Winesett

**Telephone Number:** 727-767-4106, Gwen Harmon, [ggharmon2@jhmi.edu](mailto:ggharmon2@jhmi.edu), Dawn Jones, [dawn.jones@jhmi.edu](mailto:dawn.jones@jhmi.edu)

**Faculty:** Drs. Colin Nguyen, Parrish Winesett, Peter Huszar, Himali Zayakody and Paul Carney

**Availability/Duration:** Rolling availability; duration is flexible and can be adjusted to fit student needs.

**Prerequisite(s):** Core Clerkship in Pediatrics or Medicine

**Drop Period:** 2 months

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Principles of pediatric neurology will be taught in outpatient and inpatient encounters at ACH-JHM. As a free-standing children's hospital, patient cases will reflect both general pediatric neurology exposure as well as exposure to highly specialized patient cases reflecting ACH-JHM's status as a quaternary care center. Participation in clinical or basic research in pediatric neurology may also be coordinated pending project and faculty availability.

Students will attend daily neurology clinics at ACH. Emphasis will be placed on teaching the student to evaluate and manage common neurological problems of infancy, childhood, and adolescents including epilepsy, seizure disorders, sleep disorders, and other neurologic deficits.

Students will participate in work up and care of neurology patients. The goal is to enhance student understanding of the diagnosis and management of hospitalized patients with neurologic issues. Students are expected to participate in weekly conferences including neurology specific conferences as well as resident noon conferences, JHUSOM Pediatric Neurology Grand Rounds and ACH-JHM Grand Rounds.

## PRINCIPLES IN NEUROIMMUNOLOGY

**Course Type:** Other

**Department/Division:** Neurology/Neuroimmunology

**Course Director:** Drs. Peter Calabresi and Monique Stins

**Contact:** 443-287-8027

**Faculty:** Drs. Calabresi and Stins

**Availability/Duration:** March- May; Tues & Thurs; eight weeks

**Prerequisite(s):** Basic knowledge of brain anatomy, physiology, and biology

**Drop Period:** 1 month

**Description:** Neurodegenerative brain diseases, neurological trauma and brain circulatory diseases involve activation of immune mechanisms and inflammation, contribute to disease development, and can seriously affect quality of life and ability to work.

This course covers the specific cells of the central nervous system (CNS), immune functions of CNS cells, and trafficking of leukocytes into the CNS. Relevant anatomy (e.g., blood brain barrier) will be addressed. Discusses various immune cells (monocytes, T-, B- cells), inflammatory mediators (cytokines, chemokines, metalloproteinases, and prostaglandins) and explores how these mediators contribute to the development, plasticity, and pathology of the CNS.

Speakers that are active researchers in their field will provide introductions to their respective fields and present their research. Presentations address several neuroimmunological diseases, including multiple sclerosis, HIV dementia and Alzheimer's disease. The molecular basis of novel treatment approaches of these diseases and regulation of the inflammatory mediators in neurodegeneration will also be reviewed. Interactions and discussions between lecturers and students are encouraged.

This elective follows the schedule for the School of Public Health

## NEURO CRITICAL CARE/NCCU

### *SITE FOR ADVANCED CLERKSHIP IN CRITICAL CARE*

**Course Type:** Clinical Elective

**Department/Division:** Neurology

**Course Director:** Dr. Marek Mirski, [mmirski1@jhmi.edu](mailto:mmirski1@jhmi.edu)

**Faculty:** Dr. Mirski

**Availability/Duration:** Four and 1/2 weeks; offered year-round. Enrollment limited to JHUSOM students.

**Prerequisite(s):** Core Clerkship in Neurology

## **ENROLLMENT LIMITED TO JHUSOM STUDENTS**

## VIRTUAL PATIENT ROUNDS IN NEUROLOGY

**Course Type:** Other

**Department/Division:** Neurology

**Course Director:** Dr. Rachel Salas, [rsalas3@jhmi.edu](mailto:rsalas3@jhmi.edu), Dr. Doris Leung, [leungd@kennedykrieger.org](mailto:leungd@kennedykrieger.org)

**Course Coordinator:** Bernadette Clark, [mclark44@jhmi.edu](mailto:mclark44@jhmi.edu)

**Faculty:** Dr. Rachel Salas, Dr. Doris Leung

**Availability/Duration:** 2-week elective- 4/13/2020-4/24-2020 and 5/4/2020-5/15/2020

**Prerequisite(s):** N/A

**Drop Period:** 1 month

## **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This 2-week elective course explores key aspects in the care of patients with neurologic diseases through a case-based learning approach. Chart review and live presentation of real patients seen on the neurology inpatient service or outpatient clinics will be used to practice and improve clinical thinking and learn relevant

concepts on conducting a neurological history and physical exam. In addition, students will learn skills on localizing lesions in the nervous system, forming a list of differential diagnosis and recommend treatment plans for common neurologic conditions. Case selection will be curated by the neurology clerkship directors to ensure a diverse representation of neurologic disorders. The “virtual rounds” will be moderated by faculty members and a series of small group sessions will be facilitated Osler Apprentices in Neurology, who will serve as peer teachers. Attendance to Neurology Grand Rounds and participation in lectures will complement this learning experience. Students will also meet one-on-one with course directors in preparation for their presentations. When appropriate, faculty and trainees from the Department of Neurology will be invited to provide subspecialty expertise. The course will be conducted entirely via virtual meetings and does not require in-person student or faculty contact. This elective can be offered at multiple learner levels (including pre-clerkship, post-clerkship, or sub-intern). This course will prepare students for both inpatient and outpatient case management and provide experience in remote teaching for medical trainees.

- Course Objectives:**
- Review the key signs, symptoms, and examination findings in neurological disorders
  - Practice and refine case presentation and teaching skills
  - Learn principles of localization, developing a differential diagnosis, and management of neurological diseases
  - Examine implementation strategies for neuroradiological, electrophysiological, and other diagnostic modalities in neurologic disease
  - Engage the medical literature in providing evidence-based management of neurological cases

### **RESEARCH IN MEDICAL EDUCATION OSLTER APPRENTICESHIP -NEUROLOGY**

**Course Type:** Research

**Department/Division:** Neurology

**Course Director:** Drs. Rachel Salas and Doris Leung

**Contact:** Bernadette Clark; 410-502-7393; [mclark44@jhmi.edu](mailto:mclark44@jhmi.edu)

**Faculty:** Drs. Salas, Gamaldo, Leung, and Strowd

**Availability/Duration:** All year; one to six students are chosen in the Spring to serve as OAs for the following academic year. Longitudinal elective, five hours per month July-May

**Prerequisite(s):** Neurology Core Clerkship

**Drop Period:** 2 months

**ENROLLMENT LIMITED TO JHUSOM STUDENTS**

**Description:** The Osler Apprenticeship in Neurology is an opportunity for senior medical students with an interest in academic neurology to gain experience and exposure to the technical, administrative, and educational skills central to pursuing a clinician educator academic pathway.

Osler Apprenticeships (OAs) are, first and foremost, medical students interested in becoming academic scholars. This program affords these students the opportunity to work closely with faculty members and medical students in teaching, research, or administrative environments as an integral part of that education. By the end of the program OAs will be able to do the following:

- Enhance their educational research skills and develop pedagogical skills
- Acquire experience in leadership, interpersonal effectiveness, and performance evaluation
- Acquire academic administrative experience and enjoy collegial collaborations with advisors that may result in joint publications and other professional activities

### **EQUITABLE HEALTHCARE- A VIRTUAL CLINICAL ELECTIVE IN NEUROLOGY**

**Course Type:** Other

**Department/Division:** Neurology

**Course Director:** Dr. Rachel Salas, [rsalas3@jhmi.edu](mailto:rsalas3@jhmi.edu)

**Faculty:** Dr. Doris Leung, Dr. Charlene Gamaldo, Dr. Carlos Romo

**Course Coordinator:** Bernadette Clark, [mclark44@jhmi.edu](mailto:mclark44@jhmi.edu)

**Availability/Duration:** 2-week elective; Capacity- 3 learners; Next Course Offering to be determined.

**Prerequisite(s):** Neurology core clerkship or internal medicine core clerkship if no neurology core clerkship exists at the home institution

**Drop Period:** N/A

**ENROLLMENT LIMITED TO VISITING MEDICAL STUDENTS.**

**Description:** This virtual 2-week elective course (80 hours total) explores key aspects in the care of diverse patient populations. The curriculum consists of a combination of virtual synchronous and asynchronous sessions. Students will engage in a universal curriculum as well as a specialty-specific curriculum based on their acceptance by director approval. A universal curriculum hosted in the afternoons will cover topics such as health disparities, global health, LGBTQIA+ health, telemedicine, palliative care, and community resources in Baltimore. The morning specialty-specific curriculum will explore equitable healthcare within Neurology through patient interviews, case presentations, and team discussion, allowing students to refine their skills while networking with residents and faculty.

**Course Objectives:**

- Review key diagnoses, important exams, and management of diseases in neurology
- Practice and refine case presentations and teaching skills in student's specialty-specific area of interest
- Explore how social and health disparities affect diverse populations and how to address these in a clinical setting
- Learn principles regarding equitable healthcare as it pertains to our unique Baltimore patient population

**RESEARCH OPPORTUNITIES**

DR. MARILYN ALBERT  
Alzheimer's disease

DR. PETER CALABRESI  
Neuroimmunology and neuroimaging

DR. DAVID CORNBLATH  
Neurology peripheral nerve disease and electromyography.

DR. TED DAWSON  
Molecular mechanisms of neurodegenerative disease; neuronal cell death and survival

DR. VALINA DAWSON  
Molecular mechanisms of neurodegenerative disease

DR. DANIEL DRACHMAN  
Neuromuscular diseases; neuroimmunology; gene transfer strategies for therapy of Myasthenia and ALS

DR. CHRISTOPHER EARLEY  
Sleep related disorders; sleep-wake dysfunctions; restless leg syndrome; circadian rhythm disorders

Dr. JEFFREY ELLENBOGEN  
Sleep physiology and brain sciences; sound perception during sleep

DR. RYAN FELLING  
Neurogenesis after perinatal brain injury

DR. ROMERGRYKO GEOCADIN  
Brain resuscitation; acute disorders of consciousness (coma, vegetative states); targeted temperature management of therapeutic hypothermia

DR. GARY GOLDSTEIN  
Cerebral endothelial cells

DR. BARRY GORDON  
Neuropsychology

DR. DANIEL HANLEY  
Brain injury outcomes

DR. ARGYE HILLIS  
Neural basis of cognitive impairment and recovery after stroke

DR. AHMET HOKE  
Peripheral neuropathies; nerve regeneration and drug development for neuroprotection

DR. MICHAEL JOHNSTON  
Excitatory amines in cerebral anoxia

DR. PETER KAPLAN  
Epilepsy and sleep disorders

Dr. AMIR KHERADMAND  
Neurophysiology of spatial orientation and perception of upright

DR. ERIC KOSSOFF  
Ketogenic diet; hemispherectomy; infantile spasms; migraines; intractable epilepsy; neurocysticercosis

DR. JOHN LATERRA  
Studies of brain tumors; neuro-oncology

DR. RONALD LESSER  
Epilepsy and electroencephalography

DR. MICHAEL LEVY  
Animal modeling of autoimmune neurological diseases

DR. ZOLTAN MARI  
Parkinson's disease and movement disorders

DR. ELISABETH MARSH  
Outcomes in stroke recovery

DR. JUSTIN C. MCARTHUR  
Therapies for HIV-associated dementia and sensory neuropathies; cutaneous innervations in diverse neuropathic states; multiple sclerosis; neurological infections

DR. ABHAY MOGHEKAR  
Alzheimer's disease; cerebrospinal fluid disorders

DR. BRETT MORRISON  
The role of myelinating cells and lactate in peripheral nerve regeneration and ALS

Dr. DAVID NEWMAN-TOKER  
Diagnostic errors; diagnostic cost-effectiveness; diagnostic decision support  
Eye movement-based stroke diagnosis in dizziness/vertigo

DR. ALEXANDER PANTELYAT  
Atypical parkinsonian disorders; music and rhythm-based interventions for neurological disorders

DR. LIANA ROSENTHAL  
Clinical research in movement disorders

DR. NICOLINE SCHIESS

Multiple Sclerosis

DR. ANJA SOLDAN

Cognitive aging, Alzheimer's disease; cognitive reserve

DR. HONGJUN SONG

Regulation and application of adult neural stem cells

DR. CHARLOTTE SUMNER

Genetic and cellular mechanisms of inherited motor neuron and peripheral nerve disease

DR. MARK WU

Genetic analysis of sleep disorders

## NEUROSCIENCE

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ME:440.699

### NEUROSCIENCE AND COGNITION I

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Directors:** Dr. Xinzhong Dong

**Telephone Number:** 410-502-2993

**Availability/Duration:** Taught every year; Q1 & Q2

**Prerequisite(s):** Basic cell and molecular biology or consent of course director

**Drop Period:** 1 month

**Description:** This is the first half of a 4-quarter course on the cellular and molecular basis of neural function and the neural basis of perception, cognition, and behavior. Topics covered in this half include (1) development and structure of the nervous system, (2) cellular neurophysiology, (3) neural signaling and coding, and (4) audition, vocalization, and language. Lectures will be presented by faculty in the Neuroscience, Neurology, Biomedical Engineering, Psychology, and Cognitive Science Departments. The course will also include discussion sections based on current literature and several neurotechniques sessions designed to familiarize students with current experimental approaches in cellular, systems, and molecular neuroscience. This course is required of all students in the Neuroscience Graduate Program. Students outside the program may take this course independent of Neuroscience and Cognition II.

### NEUROSCIENCE AND COGNITION II

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Director:** Dr. Veit Stuphorn

**Telephone Number:** 410-516-7963

**Availability/Duration:** Taught every year; Q3 & Q4

**Prerequisite(s):** Basic cell and molecular biology or consent of course director

**Drop Period:** 1 month

**Description:** This is the second half of a 4-quarter course on the cellular and molecular basis of neural function and the neural basis of perception, cognition, and behavior. Topics covered in this half include (1) perception of objects, space, and self, (2) movement and balance, (3) learning and memory, (4) neurological and psychiatric disorders, and (5) global function in the nervous system. Lectures will be presented by faculty in the Neuroscience, Neurology, Biomedical Engineering, Psychology, and Cognitive Science Departments. The course will also have a laboratory component. This course is required of all students in the Neuroscience Graduate Program.

### CURRENT ISSUES IN SYSTEMS AND COGNITIVE NEUROSCIENCE

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Director:** Dr. Jeremiah Cohen

**Telephone Number:** 410-502-9193

**Availability/Duration:** Q3; every year

**Prerequisite(s):** Neuroscience A or Neuroscience & Cognition II (may be taken concurrently) or permission of course director.

**Drop Period:** 1 month

**Description:** The brain is an information processing system without parallel. It excels at recognizing objects and substances, reconstructing space, analyzing sound environments, controlling complex behaviors, and storing a lifetime's worth of events and experiences. The neural mechanisms underlying these abilities are studied by a large community of systems and cognitive neuroscientists. This research has generated a rapidly evolving field of high-profile discoveries and lively debates between competing laboratories. This course aims to convey a clear sense of this field by focusing on current experimental and conceptual controversies regarding organization and function in



the vertebrate nervous system. Each week will focus on a different topic represented by two or more recent papers (selected by an instructor) reflecting opposing points of view. Students will present the papers informally and direct a debate over the relative merits of the conflicting viewpoints. The quarter-long course will be divided into 2–3-week sections covering different sensory, motor, or cognitive systems, in addition to computational neuroscience. There will be one 2-hour debate each week, and participation in the 1-hour Systems Journal Club (Readings in Systems Neuroscience, ME440.810) will also be required.

### READINGS IN SYSTEMS NEUROSCIENCE

**Course Type:** Tutorial  
**Department:** Neuroscience  
**Course Director:** Drs. Kristina Nielsen and Kishore Kuchibhotla  
**Telephone Number:** 410-516-5833; 202-631-6435  
**Availability/Duration:** All year  
**Prerequisite(s):** Consent of course director  
**Drop Period:** 1 month

**Description:** This is a discussion-based journal club course run by the Neuroscience Training Program offered at the School of Medicine.

### READINGS IN NEUROSCIENCE

**Course Type:** Tutorial  
**Department:** Neuroscience  
**Course Directors:** Drs. Gul Dolen and Andrew Gordus  
**Telephone Number:** 443-287-2091; 443-516-6509  
**Availability/Duration:** All year; Course not eligible for elective credit  
**Prerequisite(s):** Consent of course director  
**Drop Period:** 1 month

**Description:** This is a discussion-based journal club course run by the neuroscience training program offered at the school of medicine.

### CIRCUITS AND BRAIN DISORDERS

**Course Type:** Tutorial  
**Department:** Neuroscience  
**Course Directors:** Drs. Paul Worley, Marilyn Albert, and Barry Greenberg  
**Telephone Number:** 410-502-5489, 410-614-3040, 410-955-1696  
**Availability/Duration:** Q1 & Q2; Course not eligible for elective credit  
**Prerequisite(s):** Undergraduate background in Neuroscience  
**Drop Period:** 1 month

**Description:** This course focuses on diseases of the nervous system and provides a balance of clinical presentation, basic neurobiology, genetics, and biomarkers, as well as a presentation of therapeutic approaches, where relevant. One of the goals is to highlight the distinct circuitry that is most impacted in each disorder. The curriculum includes 1 seminar per week and 1 journal club discussion related to the seminar per week.

### PHYSIOLOGY OF SENSORY TRANSDUCTION

**Course Type:** Tutorial  
**Department:** Neuroscience  
**Course Director:** Dr. King-Wai Yau  
**Telephone Number:** 410-955-1260  
**Availability/Duration:** Q2, alternate years  
**Prerequisite(s):** Consent of course director  
**Drop Period:** 1 month

**Description:** A seminar and reading course that covers current research in sensory transduction from a physiological perspective. Visual, chemical, and auditory transductions will be covered.

## CURRENT TOPICS IN NEUROSCIENCE

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Director:** Dr. Jeremiah Cohen

**Telephone Number:** 410-502-9193

**Availability/Duration:** Thursdays at 1 p.m.; all year

**Drop Period:** 1 month

**Description:** Weekly lecture on current research by active researchers. Topics are chosen so that an overall balance of subjects in neuroscience is covered in the course of a year.

## NEUROPHARMACOLOGY

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Director:** Dr. Jay Baraban

**Telephone Number:** 410-955-2499

**Faculty:** Dr. Jay Baraban and Dr. Solomon Snyder

**Availability/Duration:** Q1; alternate years. Three hours per week plus assigned reading

**Prerequisite(s):** Neuroscience and Cognition I and II or consent of course director

**Drop Period:** 1 month

**Description:** Focusing on several major classes of psychotropic drugs, the course will illustrate the use of diverse approaches (molecular, biochemical, electrophysiological, and behavioral) to decipher how psychotropic drugs influence the nervous system. The course will utilize a lecture format for the first two classes and then switch to a "journal club" format with students presenting and discussing classic and recent articles. Topics covered include opiates, benzodiazepines, antipsychotic drugs, antidepressant drugs, and cannabinoids.

## BRAIN DISEASES: NEURODEVELOPMENTAL DISEASES

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Director:** Dr. Christopher Ross and Dr. Daniel Weinberger

**Telephone Number:** 410-614-9494

**Availability/Duration:** Q4; alternate years beginning Spring 2016

**Prerequisite(s):** Neuroscience and Cognition I & II or consent of course director

**Drop Period:** 1 month

**Description:** This course will consider the emerging unity of approaches and concepts in understanding a range of brain diseases such as schizophrenia, bipolar disorder, autism, and related disorders. Genetic mutations or risk factors for many of these diseases are beginning to illuminate pathogenesis, and genetic relationships among the diseases are beginning to change our thinking about diagnostic categories. Interactions among protein or RNA products of genes mutated in each disease may help establish pathogenic pathways. Environmental influences also appear to be important, including possible roles of infection and immunity. Schizophrenia and related adult-onset disorders appear to be caused by mechanisms involving neurodevelopment, whose major consequences are most visible during adulthood. Cell and mouse models are increasingly central for understanding pathogenesis and developing novel therapeutics. For all the disorders, it is possible to conceive of a unified understanding ranging from molecular manifestations to systems neurobiology. Ultimately, the goal is to devise rationale disease-modifying treatments. Lectures by experts in each disease will be followed by student-led discussions critically reviewing current literature. Discussions will focus on strengths and limitations of current models, controversies about mechanisms, unresolved research questions, and potential paths to therapeutics. Student participation will include leading and participating in discussions of papers and writing a research proposal using an abbreviated NIH grant format on any topic related to the course.

## **BRAIN DISEASES: NEURODEGENERATIVE DISEASES**

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Director:** Dr. Christopher Ross and Dr. Jeffrey Rothstein

**Telephone Number:** 410-614-9494

**Availability/Duration:** Q4; alternate years beginning Spring 2015

**Prerequisite(s):** Neuroscience and Cognition I & II or consent of course director

**Drop Period:** 1 month

**Description:** The course will provide an in-depth examination of the biology of the classic neurodegenerative disease such as Huntington's disease, Parkinson's disease, ALS and Alzheimer's disease, and other diseases may be considered depending on student and faculty interest. All involve toxicity or death of neurons. Rare genetic variants of many of the neurodegenerative diseases have greatly illuminated the more common, apparently sporadic, forms. Interactions among protein products of genes mutated in each disease are helping establish pathogenic pathways. Inflammation and metabolic stress are other common themes, environmental contributions, possibly involving toxins, are important for some diseases. Cell and mouse models are increasingly central for understanding pathogenesis and several diseases, though the exact mechanisms and relation to cell death are controversial. It is increasingly possible to conceive of a unit understanding ranging from molecular manifestations to systems neurobiology. Ultimately the goal is to devise rational disease-modifying treatments. Lectures by experts in each disease will be followed by student-led discussions critically reviewing current literature. Discussions will focus on strengths and limitations of current models, controversies about mechanisms, unresolved research questions, and potential paths to therapeutics. Student participation will include leading and participating in discussion of papers, and writing a research proposal, using an abbreviated NIH grant format, on any topic related to the course.

## **CELLULAR AND MOLECULAR BASIS OF NEURAL DEVELOPMENT II: REGULATION OF NEURAL CONNECTIVITY**

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Directors:** Drs. Christopher Potter, Alex Kolodkin, Shanthini Sockanathan, and Uli Mueller

**Telephone Number:** 410-614-9494, 410-502-3084, 410-614-9499; 443-287-4762

**Faculty:** Drs. Christopher Potter, Alex Kolodkin, Shanthini Sockanathan, Uli Mueller, Charrlotte Sumner, Fenquan Zhou, Solange Brown, and Loyal Goff

**Availability/Duration:** Q4; yearly

**Prerequisite(s):** Completion of Neuroscience Cognition I or consent of course director

**Drop Period:** 1 month

**Description:** This is a seminar and reading course devoted to the discussion of the cellular and molecular processes underlying neuronal development. This is a seminar and reading course devoted to the discussion of the cellular and molecular processes underlying neuronal development. Topics and dates covered include Axon guidance; Growth cone motility and steering mechanisms; Target Matching; Guidance at the CNS Midline; Synaptic differentiation in the NMJ; Activity-dependent plasticity in the PNS and CNS; Regulation of process self-avoidance, tiling and mosaic spacing; Pruning; Developmental diseases; Glial influences on connectivity; Sexual dimorphism in neural circuits; Viral tracing and single neuron RNAseq; Neural Regeneration.

This course is designed to complement The Cellular and Molecular Basis of Neural Development I: Neuronal Differentiation, which is offered in alternate years (next offering, Spring 2020). Students must have either completed Introduction to Neuroscience and Cognition I or have received the consent of the course directors prior to registering for this course.

## **CELLULAR AND MOLECULAR BASIS OF NEURAL DEVELOPMENT I: NEURONAL DIFFERENTIATION**

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Directors:** Drs. Alex Kolodkin, Christopher Potter, and Uli Mueller

**Telephone Number:** 410-614-9499; 443-287-4151; 443-287-4762

**Faculty:** Drs. S. Blackshaw, A. Doetzlhofer, A. Kolodkin, G. Lee, S. Margolis, C. Potter, S. Sockanathan, and F. Zhou

**Availability/Duration:** Alternates with Cellular and Molecular Basis of Neural Development II: Regulation of Neural Connectivity; **visiting medical students must follow JHUSOM quarter dates**

**Prerequisite(s):** Completion of Neuroscience Cognition I or consent of course directors

**Drop Period:** 1 month

**Description:** A seminar and reading course devoted to the discussion of the cellular and molecular processes underlying neuronal development. Topics include cell proliferation and migration, nervous system patterning, differentiation of neurons and glia, morphogen and growth factor signaling mechanisms, neuronal polarity, neural stem cell biology, and neurovascular biology. Examples from vertebrate and invertebrate model systems will be covered. This course is designed to complement The Cellular and Molecular Basis of Neural Development II: Axon Guidance and Synaptogenesis, offered alternate years. Students must have completed Introduction to Neuroscience and Cognition I or receive the consent of course directors prior to registering for this course.

### MECHANISMS OF SYNAPTIC TRANSMISSION

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Director:** Drs. Dwight Bergles, Elisabeth Glowatzki, and Paul Worley

**Telephone Number:** 410-955-4050, 410-955-6939, 410-502-5489

**Faculty:** Drs. Bergles, Glowatzki and Worley

**Availability/Duration:** Q4; alternate years

**Prerequisite(s):** Consent of course director

**Drop Period:** 1 month

**Description:** A seminar and reading course devoted to the molecular mechanisms underlying synaptic transmission and the regulation of synaptic plasticity. The structure and function of neurotransmitter receptors, ion channels and synaptic vesicle proteins will be discussed. In addition, the molecular mechanisms involved in the control of synaptic transmission such as the trans-synaptic regulation of the function and expression of synaptic proteins will be examined.

### TRENDS IN THE NEUROBIOLOGY OF AGING

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Director:** Dr. Mark P. Mattson

**Telephone Number:** 410-558-8463

**Faculty:** Dr. Mattson

**Availability/Duration:** Q1; alternate years

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** As the average lifespan of humans increases, age-related dysfunction of the nervous system and neurodegenerative disorders such as Alzheimer's and Parkinson's diseases are becoming major concerns in our society. Recent advances in understanding the molecular and cellular underpinnings of nervous system aging and neurodegenerative disorders will be the focus of this course. Emerging findings of genetic and environmental factors that either promote successful brain aging or predispose to age-related neurological disorders, and the elucidation of their underlying molecular and cellular mechanisms, will be emphasized. This course will consist of several introductory lectures and subsequent sessions in which hot topics in the field are discussed.

### TOPICS IN CORTICAL PLASTICITY

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Director:** Drs. Alfredo Kirkwood and Hey-Kyoung Lee

**Telephone Number:** 410-516-6410; 410-516-5712

**Faculty:** Drs. Kirkwood and Lee

**Availability/Duration:** Q1

**Prerequisite(s):** Consent of course director

**Drop Period:** 1 month

**Description:** Experience-dependent changes in cortical synapses and circuits are critical for proper development of the nervous system and for memory storage. This course will focus on recent findings on fundamental mechanisms of plasticity from synapses to circuit level through discussions of recent research papers. Grades will be based on student presentations and participation.

### THE HYPOTHALAMUS: THE BRAIN'S MASTER HOMEOSTAT

Course Type: Tutorial

**Department:** Neuroscience

**Course Director:** Dr. Seth Blackshaw

Telephone Number: 443-287-5609

**Faculty:** Dr. Blackshaw

**Availability/Duration:** Q3; Course not eligible for elective credit

**Drop Period:** 1 month

**Description:** The hypothalamus is the central regulator of a broad range of homeostatic behaviors essential to survival and plays a key role in controlling emotional and appetitive behaviors. This course offers an overview of both historical and recent work on this vital brain region. Topics covered will include the evolution and development of the hypothalamus, control of circadian rhythms and sleep, regulation of hunger and body temperature, as well as hypothalamic regulation of sexual, defensive, and affiliative behavior. Each class will include 10-15 minutes of introductory lecture, followed by in-class discussion of 2 relevant recent papers. The final grade will be based on class participation and one 6-page review article or mock grant proposal on any related topic. An optional lecture on good grant writing practices will also be offered. Students must have completed Neuroscience Cognition I and II or have permission of instructors. Maximum enrollment of 15 students.

### BIOENERGETICS, NEUROPLASTICITY AND BRAIN HEALTH

Course Type: Tutorial

**Department:** Neuroscience

**Course Director:** Dr. Mark Mattson

Telephone Number: 410-558-8463

**Faculty:** Dr. Mark Mattson

**Availability/Duration:** Q2; Course not eligible for elective credit

**Prerequisite(s):** Neuroscience and Cognition I & II

**Drop Period:** 1 month

**Description:** Overindulgent sedentary lifestyles are increasingly common with adverse consequences for trajectories of brain health in current and future generations. This course will review findings from studies of humans and animals that are elucidating the cellular and molecular mechanisms by which energy intake and exercise affect structural and functional neuroplasticity. This topic will be considered from a bioenergetic perspective with emphases on brain evolution, developmental neurobiology, adult neuroplasticity and disorders of mood and cognition. The course will consist of a series of introductory lectures, and subsequent class meetings in which hot topics in the field are discussed.

### COMPUTATIONAL PRINCIPLES OF BIOLOGICAL VISION

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Director:** Drs. Kristina Nielsen and Charles Connor

**Telephone Number:** 410-516-5833, 410-516-8648

**Faculty:** Dr. Hendry

**Availability/Duration:** Q1& 2

**Prerequisite(s):** Consent of course director

**Drop Period:** 1 month

**Description:** Even though we rarely acknowledge it as such, vision is our superpower. It is so central to how we (or at least most of us) interact with the world, and it comes to us with such ease, that we underappreciate its complexity. To this date, there are no computer vision programs that can parallel the performance of the human visual system. Vision is also the topic that both of us actively research, and are passionately interested in. Lastly, the neural underpinnings of vision are amongst the most thoroughly studied. As such, vision provides a very useful framework for learning about general principles of Neuroscience.

The goal of this class is to teach you the Neuroscience of vision, with topics ranging from a general overview of the visual system to highlighting ongoing research studies. We will also talk about state-of-the-art computer vision efforts as a comparison. The class is designed to not only provide you with the relevant background knowledge, but also to teach you how to critically evaluate current research papers. As such, the class will be split into 'classical' lectures, in which we provide an overview over a particular topic, and discussion classes. Discussion classes will serve to discuss one or two original research papers in depth. Our intention is for the discussion classes to feel like a real journal club or lab meeting, with a very active discussion amongst all of the participants.

To achieve the latter will require rigorous work by everybody. All of the reading for the discussion classes will be primary material, which might (at least initially) be challenging. However, if we all do our job right, you should be well able to easily read the primary literature by the end of the class. Nonetheless, be prepared to work hard, and set aside time for the reading. This is a small and very advanced seminar, and participation in the discussions will be a central part of it (including your grade). Talking (or not talking) about things you haven't read will not go unnoticed (and make us annoyed) and will be reflected in your grade. Attendance at every session is required.

### NEUROSCIENCE CAREER SKILLS

**Course Type:** Tutorial

**Department:** Neuroscience

**Course Director:** Dr. Marshall Shuler

**Telephone Number:** 410-502-1612

**Availability/Duration:** Q3&4; every other year

**Prerequisite(s):** Consent of course director

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course is intended for Neuroscience Program graduate students who are in their fourth year or beyond. There will be ten sessions, and each session we will include one or more invited discussion leaders. This is a pass/fail course, and every participant is required to take it for credit. A grade of pass or fail will be decided based on attendance.

### WRITING ABOUT THE BRAIN

**Course Type:** Tutorial

**Department/Division:** Neuroscience

**Course Director:** Dr. David Linden

**Faculty:** Dr. David Linden

**Telephone Number:** 410-614-1529

**Availability/Duration:** Q3; every other year, 8 students maximum

**Prerequisite(s):** Neuroscience and Cognition I and consent of course director

**Drop Period:** 1 month

**Description:** The goal of this course is to train neuroscientists to effectively and clearly communicate ideas about nervous system function to a general audience. Students shall read and analyze writings about neuroscience and shall interact with established science writers. More importantly, they shall develop, research, and write both news and feature-length stories that shall be presented, critiqued, and revised each week in a workshop format. Enrollment is limited to 10 students.

## RESEARCH OPPORTUNITIES

DR. MARILYN ALBERT

Cognitive processes in aging and neurodegenerative disorders

DR. YEXICA APONTE

Neuronal circuits underlying goal-directed behaviors

DR. JAY M. BARABAN

Molecular mechanisms of neural plasticity

DR. AMY BASTIAN

Mechanism of human movement disorders

DR. DWIGHT BERGLES

Synaptic physiology: glutamate transporters and glial involvement in neuronal signaling

DR. SETH BLACKSHAW

Molecular basis of cell specification in vertebrate retina and hypothalamus

DR. MARY BLUE

Neurotransmitter mechanisms in the development and activity-dependent plasticity

DR. ANTONELLO BONCI

Synaptic plasticity; dopamine and substance abuse disorders

DR. FRANK BOSMANS

Molecular organization and pharmacologic properties of the voltage-gated sodium channel signaling complex

DR. SOLANGE BROWN

Functional organization of local circuits of the neocortex

DR. PETER CAMPOCHIARO

Molecular aspects of retinal repair and regeneration

DR. MICHAEL CATERINA

Molecular mechanisms of thermosensation and nociception

DR. PABLO CELNIK

Neurophysiological mechanisms underlying human motor learning

DR. JEREMIAH COHEN

Neural circuits for reward, mood, and decision making

DR. CARLO COLANTUONI

Functional genomics of human brain development

DR. CHARLES CONNOR, JR

Object synthesis in higher level visual cortex

DR. SUSAN COURTNEY-FARUQUEE

Functional organization of the neural system for human working memory

DR. KATHLEEN CULLEN

Neural mechanisms underlying the computation of Self-Motion: understanding and advancing the treatment of vestibular and other motor disorders

DR. TED DAWSON

Molecular and cellular signals controlling neurodegeneration; neuronal survival and cell death

DR. VALINA DAWSON

Molecular mechanisms of neuronal death and survival

DR. JOHN DESMOND

Cognitive neuroscience; cerebro-cerebellar circuits in learning and memory

DR. ANGELIKA DOETZLHOFER

Cell fate specification and differentiation in the mammalian auditory system

DR. GUL DOLEN

Synaptic and circuit mechanisms of social behavior

DR. XINZHONG DONG

Molecular and genetic studies of pain-sensing neurons

DR. WENZHEN DUAN

Translational neurobiology research

DR. SASCHA DU LAC

Eye movements, the cerebellum, and the vestibular system

DR. DANIEL EBERT

Molecular mechanisms of autism and schizophrenia

DR. HOWARD EGETH

Perception and cognition; attention and attentional selectivity; eyewitness testimony

DR. MOHAMED FARAH

Axonal regeneration in the peripheral nervous system

DR. PAUL FUCHS

Excitability and synaptic function in cochlear hair cells

DR. MICHELA GALLAGHER

Neural mechanisms of memory and attention

DR. ELISABETH GLOWATZKI

Synaptic transmission at hair cell synapses in the inner ear

DR. LOYAL GOFF

Long non-coding RNAs in neuronal and glial cell fate specification

DR. MARNIE HALPERN

Zebra fish neural development

DR. SAMER HATTAR

Physiological effects of light on mammals: role of the novel melanopsin-containing retinal ganglion photoreceptors

DR. AHMET HOKE

Neurobiology of peripheral neuropathies; development and regeneration of the peripheral nervous system

DR. RICHARD L. HUGANIR

Molecular mechanisms in the regulation of synaptic plasticity

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NEUROSCIENCE



DR. PATRICIA JANAK  
Behavioral neuroscience of addiction

DR. ALFREDO KIRKWOOD  
Mechanisms of cortical modification

DR. JAMES KNIERIM  
Behavioral neurophysiology of the hippocampal formation

DR. ALEX L. KOLODKIN  
Molecular mechanisms of growth cone guidance

DR. JOHN KRAKAUER  
Mechanisms of human sensorimotor learning and motor recovery after brain injury

DR. REJJI KURUVILLA  
Signaling and trafficking of growth factors in neuronal development

DR. JOHN J. LATERRA  
CNS tumor biology and blood-brain barrier

DR. GABSANG LEE  
Disease modeling of muscular dystrophies and peripheral neuropathies with human pluripotent stem cells

DR. HEY-KYOUNG LEE  
Cellular/molecular mechanisms of synaptic plasticity underlying memory formation and cross-modal plasticity

DR. FREDERICK LENZ  
Neurophysiology and psychophysics for sensory and motor processing in the human forebrain

DR. DAVID LINDEN  
Cellular substrates of memory

DR. TOM LLOYD  
Neuronal intracellular transport in development and disease

DR. BRADY MAHER  
Functional analysis of genes associated with psychiatric disorders

DR. SETH MARGOLIS  
Molecular mechanisms of synapse formation in development and disease

DR. KERI MARTINOWICH  
Molecular and cellular regulation of neural plasticity

DR. MOLLIE MEFFERT  
Transcriptional regulation of neuronal function in health and disease

DR. CYNTHIA MOSS  
Spatial perception, attention, and memory

DR. ULRICH MUELLER  
Auditory perception and development of neocortical circuits

DR. JEFF MUMM  
Neural circuit formation, function, and regeneration

DR. SHREESH MYSORE  
Neural circuits and computations for behavior

DR. JEREMY NATHANS  
Molecular biology of the visual system

DR. ERNST NIEBUR  
Computational neuroscience

DR. KRISTINA NIELSEN  
Neural circuits underlying object recognition

DR. DANIEL O'CONNOR  
Neural circuits for touch perception

DR. PANKAJ JAY PASRICHA  
Enteric neuroscience, visceral pain, and neural control of metabolic syndromes

DR. JONATHAN PEVSNER  
Molecular basis of neurological disorders

DR. MIKHAIL PLETNIKOV  
Gene-environment interactions in neurodevelopmental disorders

DR. CHRISTOPHER POTTER  
Neural circuits required for insect olfaction

DR. ZHAOZHU QIU  
Mechanisms of Osmotic Regulation in Physiology and Disease

DR. RANDALL R. REED  
Molecular mechanisms of signal transduction; neurogenesis in the olfactory system

DR. IRVING RETI  
Behavioral neuroscience and its clinical applications

DR. CHRISTOPHER A. ROSS  
Biology of neuropsychiatric disorders

DR. JEFFREY ROTHSTEIN  
Molecular mechanisms of neurodegeneration and transporters

DR. AKIRA SAWA  
Neurobiology of psychiatric illness

DR. RONALD L. SCHNAAR  
Cell surface molecules in neural cell-cell recognition; myelin maintenance; axon regeneration

DR. LAWRENCE P. SCHRAMM  
Regulation of sympathetic neurons

DR. REZA SHADMEHR  
Computational motor control and learning

DR. MARSHALL SHULER  
Neural mechanisms of reward dependent learning

DR. BARBARA SLUSHER

Drug-discovery

DR. SOLOMON SNYDER

Neurotransmitters, second messengers, and drug action in the nervous system

DR. SHANTHINI SOCKANATHAN

Cell fate specification in the central nervous system

DR. VEIT STUPHORN

Neurophysiological mechanisms of decision making and self-control

DR. CHARLOTE SUMNER

Genetic and cellular mechanisms of motor neuron disease

DR. JOSHUA VOGELSTEIN

Open connectome project

DR. KATHRYN WAGNER

Muscle growth and regeneration

DR. JIOU WANG

Mechanisms of neurodegeneration and protein quality control

DR. XIAOQIN WANG

Neural basis of auditory perception and learning

DR. SHIGEKI WATANABE

Cellular and molecular characterizations of rapid synaptic membrane trafficking

DR. DANIEL WEINBERGER

Neurobiological mechanisms of genetic risk for developmental brain disorders

DR. MARY ANN WILSON

Mechanisms of development, plasticity, and injury in the immature brain

DR. DEAN WONG

In vivo PET/SPECT neuroimaging of neuroreceptor systems

DR. PHILIP WONG

Molecular mechanism and experimental therapeutic of neurodegenerative diseases

DR. PAUL F. WORLEY

Molecular mechanisms of neuronal plasticity

DR. MARK WU

Genetic mechanisms and neuronal circuitry underlying sleep in drosophila

DR. KING-WAI YAU

Visual and olfactory sensory transduction

DR. DONALD J. ZACK

Molecular approaches to the study of retinal development

DR. DAVID S. ZEE

Regulation of eye movements; vestibular perception and eye-movement based stroke diagnosis

DR. KECHEN ZHANG  
Theoretical neuroscience

DR. FENGQUAN ZHOU  
Molecular mechanisms of axon growth and guidance during development; CNS regeneration

## ONCOLOGY DEPARTMENT

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### SEMINAR COURSE: BIOLOGY OF CANCER (ME.510.700)

**Course Type:** Other

**Department/Division:** Oncology

**Course Directors:** Drs. Hariharan Easwaran, Mathias Holdhoff, and Sara Sukumar

**Telephone Number:** 410-955-8823

**Faculty:** Dr. Sukumar

**Availability/Duration:** Q4; 2 hours per week. Offered every other year, alternates with New Approaches to Cancer Prevention Therapy. M, T 12:00 PM, Zoom

**Contact:** Gail Voelker (5-8823) with questions regarding schedule; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** Selected timely topics will be considered in some detail. Emphasis is placed on the fundamental biological processes underlying oncogenesis and factors affecting the course of various neoplastic diseases. A basic foundation will be developed that will permit the student to approach various aspects of oncology including epidemiology, carcinogenesis, environmental issues, biologic behavior of the neoplastic cell and the rationale for the use of various treatment modalities with understanding.

### SEMINAR COURSE: NEW APPROACHES TO CANCER PREVENTION AND THERAPY (ME.510.701)

**Course Type:** Other

**Department/Division:** Oncology

**Course Directors:** Drs. Hari Easwaran, Mathias Holdhoff, and Sara Sukumar

**Telephone Number:** 410-955-8823

**Faculty:** Drs. Sukumar and Holdhoff

**Availability/Duration:** Q4; 2 hours per week. Offered every other year, alternates with Biology of Cancer. M, T 12:00 PM, Zoom

**Contact:** Gail Voelker (5-8823) with questions regarding the schedule; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** Selected timely topics relevant to novel diagnostic and treatment techniques being developed for the management of patients with cancer are considered with a view toward illustrating the underlying principles. Emphasis is placed on illuminating the chemical and biologic basis of therapeutics and their translation impact on clinical practice.

### FUNDAMENTALS OF CANCER: CAUSE TO CURE (ME:510.706)

**Course Type:** Other

**Department/Division:** Oncology

**Course Director:** Drs. Stacy Cooper, Kristen Marrone

**Telephone Number:** Gail Voelker, 410-955-8823 or email: [voelkga@jhmi.edu](mailto:voelkga@jhmi.edu)

**Faculty:** Oncology Center faculty

**Availability/Duration:** Thursdays starting in mid-August through February, 1:30 PM – 2:30 PM biennially (see schedule when available); **visiting medical students must follow JHUSOM quarter dates**

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** The course is designed to be highly translational, covering fundamental molecular biology of cancer, the processes and pathophysiology of transformation and metastasis, and how targeted screening strategies and therapies for treatment and prevention emerge from new scientific knowledge. The course is divided into three modules: pathophysiology of cancer, therapy of cancer and disease overviews. Each of the eight disease overviews

will summarize a common cancer diagnosis, highlighting two key elements from the pathophysiology and therapy modules. We have chosen a diverse faculty, each of whom will be lecturing in the area for which they are widely recognized as world experts.

Student evaluation is pass/fail. A passing grade will depend on >80% attendance and completion of lecture evaluations. Students are responsible for making sure their attendance is recorded at each meeting. Instructions will be provided at the start of the class.

### INTRODUCTION TO CANCER RESEARCH

**Course Type:** Basic or clinical research

**Department/Division:** Oncology

**Course Director:** Dr. Stuart Grossman

**Telephone Number:** 410-955-8823 or email: [voelkga@jhmi.edu](mailto:voelkga@jhmi.edu); **visiting students** should not contact the department directly as the application process must be coordinated through the Registrar's Office.

**Faculty:** Oncology Center faculty

**Availability/Duration:** All year; minimum of 4 weeks for Johns Hopkins students; 9 weeks for visiting students.

Note: Due to COVID-19 we will not be accepting visiting medical students at this time. We will revisit this status in July 2022. Research experiences are offered on a space available basis to U.S. and international trained medical students who submit appropriate materials to the Registrar's Office. Positions are based on limited availability and are not guaranteed.

**Prerequisite(s):** None; arrange with faculty member (visiting students must contact the Registrar's Office)

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Interested and properly qualified students are encouraged to collaborate in clinical and laboratory research projects with members of the staff. Students will participate in research seminars and related teaching sessions. Interviews will be arranged with staff members to develop a mutually agreed-upon plan of study and research.

### CLINICAL CLERKSHIP IN BONE MARROW TRANSPLANTATION

**Course Type:** Clinical Clerkship

**Department/Division:** Oncology/ Hematologic Malignancies

**Course Director:** Dr. Richard Jones

**Telephone Number:** 410-955-2006

**Faculty:** Attending physicians of the Bone Marrow Transplantation Program

**Availability/Duration:** All year; ½ quarter; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Core Clerkship in Medicine or Pediatrics

**Drop Period:** 1 month

**Description:** The principles and practice of bone marrow transplantation (BMT) will be stressed. Students will work on the inpatient BMT Unit of the Oncology Center and participate in the daily activities of the service including rounds, lectures, seminars, and informal discussions. Under supervision, the student will follow the clinical course of selected inpatients including follow up marrow graft recipients in the BMT Outpatient Clinic. The student will have the opportunity to become acquainted with the allied disciplines and procedures that relate to clinical BMT, including histocompatibility testing, marrow collection ("harvesting"), and ex vivo marrow processing.

A syllabus of pertinent literature will be provided. The student will also be encouraged to conduct and present a BMT-related research/literature review project.

### ADVANCED CLINICAL CLERKSHIP IN ONCOLOGY

**Course Type:** Advanced Clinical Clerkship

**Department/Division:** Medical Oncology

**Course Director:** Dr. Ross C. Donehower

**Telephone Number:** 410-955-8838

**Faculty:** Dr. Donehower and Medical Oncology faculty

**Availability/Duration:** All year; ½ quarter; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Core Clerkship in Medicine

**Drop Period:** 1 month

**Description:** This elective will acquaint students with the principles and practice of oncology. Each student will serve as an advanced clinical clerk on one of three inpatient units. The student is expected to attend weekly outpatient clinic, daily rounds with the attending physician as well as two weekly conferences: Oncology Grand Rounds and the Multidisciplinary Clinical Conference. Other disease-oriented conferences should be attended as appropriate. Appropriate readings are recommended.

### ADVANCED CLERKSHIP IN PEDIATRIC ONCOLOGY

**Course Type:** Advanced Clinical Clerkship

**Department/Division:** Pediatric Oncology

**Course Director:** Dr. Stacy Cooper

**Telephone Number:** 410-614-5055

**Faculty:** Pediatric Oncology Division Faculty

**Availability/Duration:** All year; 4 weeks; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Core Clerkship in Pediatrics

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Students will have the opportunity to help care for children with cancer on the inpatient Pediatric Oncology and Bone Marrow Transplant Services. Patient population includes children with brain tumors, solid tumors, leukemia, lymphoma, and bone marrow transplant recipients, as well as those requiring admission related to complications of treatment. Students will be assigned patients and become an integral member of the medical team and have outpatient once per week. Lectures focused on the inpatient service occur at least twice a week. Students also attend a weekly conference including fellows' educational session and tumor board.

### ADVANCED LABORATORY RESEARCH

**Course Type:** Basic Research

**Department/Division:** Oncology Center

**Course Director:** Dr. Stuart Grossman

**Telephone Number:** Gail Voelker, 410-955-8823 or email [voelkga@jhmi.edu](mailto:voelkga@jhmi.edu)

**Faculty:** Oncology faculty as arranged

**Availability/Duration:** All four quarters; 1 year. Positions are based on limited availability and are not guaranteed.

**Prerequisite(s):** Completion of years one and two

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Advanced research under the supervision of an Oncology faculty member. Research fellowships in basic and translational laboratory research on clinically relevant questions are available to students preparing themselves for careers in teaching and research.

### CLINICAL CLERKSHIP IN MEDICAL ONCOLOGY AT JOHNS HOPKINS BAYVIEW MEDICAL CENTER

**Course Type:** Clinical Clerkship

**Department/Division:** Oncology

**Course Director:** Dr. Kristen Marrone **Telephone Number:** 410-550-4525

**Faculty:** Drs. Richard Battafarano, Julie Brahmer, Malcolm Brock, Ilene Browner, David Ettinger, Patrick Forde, Russell Hales, Christine Hann, Rakhi Naik, and Stephen Yang

**Availability/Duration:** All year; 2-4 weeks; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** There are no absolute prerequisites, but completion of a Core Clerkship in Medicine will help the student fully participate in the elective.

**Drop Period:** 1 month

**Description:** This clinical experience in medical oncology exposes trainees to the multi-disciplinary practice of medical oncology, including inpatient consults and outpatient clinics in solid tumor and malignant hematology. A special feature of the clerkship is the weekly Thoracic Multidisciplinary Clinic with medical, radiation, and surgical oncologists.

### SUBINTERNSHIP IN CLINICAL BONE MARROW TRANSPLANTATION

**Course Type:** Subinternship

**Department/Division:** Oncology Center/ Hematologic Malignancies

**Course Director:** Dr. Richard Jones

**Telephone Number:** 410-955-2006

**Faculty:** Attending physicians of the Bone Marrow Transplantation Program

**Availability/Duration:** Any ½ quarter, including summers; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Senior students only. Completion of Core Clerkship(s) in Medicine and/or Pediatrics is essential. Students interested in this subinternship should contact the course director (410-955-8464) to arrange an interview and to discuss availability of elective.

**Drop Period:** 2 months

**Description:** This clinical elective will provide an in-depth experience in the management of patients undergoing allogeneic or autologous bone marrow transplantation (BMT) in the Johns Hopkins Oncology Center SKCCC. The student subintern will work with the BMT team, which consists of an attending physician, a clinical oncology fellow, a medical resident, and a physician assistant, plus staff members in nursing, nutrition, pharmacy, and social work.

The subintern will assume responsibilities for the direct care of selected BMT inpatients, under the guidance of the attending physician and clinical fellow, and will assume night call every fourth night.

The subintern is expected to participate in daily work rounds, didactic BMT lectures given by the inpatient attending physician, informal discussions about allied topics and current research activities, graft-versus-host disease walk rounds, and Oncology Center departmental seminars. The student will receive a syllabus of pertinent literature on both the clinical aspects and basic immunobiology of bone marrow transplantation.

During this elective, the subintern will also have the opportunity to become acquainted with the allied disciplines and procedures that relate to clinical BMT, including histocompatibility testing, marrow collection ("harvesting"), and ex vivo marrow processing (e.g., lymphocyte depletion, chemotherapeutic treatment, cryopreservation). As part of this subinternship, the student will also be introduced to the basic and clinical research activities of the BMT program.

### RESEARCH OPPORTUNITIES

Dr. A. SYED ALI  
Multiple myeloma

DR. R. AMBINDER  
Molecular virology; lymphoma

DR. M. ARMANIOS  
Biology of aging; telomere syndromes; pulmonary fibrosis; solid tumors



DR. D. ARMSTRONG

Gynecology and breast cancer

DR. N. AZAD

Phase I studies and drug development; GI cancers (liver and colon)

DR. S. BAYLIN

Epigenetic abnormalities in cancer

DR. I. BORRELLO

Multiple myeloma immunotherapy; myeloid derived suppressor cells; marrow infiltrating lymphocytes

DR. J. BRAHMER

Lung cancer; novel therapeutics; mesothelioma; lung cancer prevention

DR. W. BRENNEN

Prostate cancer, tumor microenvironment, mesenchymal stem cells, novel cell-based, prodrug and immunotherapies

DR. P. BROWN

Molecularly targeted therapies for childhood leukemias

DR. I. BROWNER

Geriatric and general oncology

DR. R. CASERO

Amine oxidases as antineoplastic targets; chromatin remodeling; inflammation/infection induced cancer; molecular pharmacology

DR. A. CHEN

Bone marrow transplantation; immunotherapy

Dr. Y. CHOI

Molecular mechanisms of mitochondrial quality control by human oncogenic virus

DR. K. COHEN

Pediatric neuro-oncology

DR. K. COOKE

Immune mechanisms of graft vs. host disease; pulmonary dysfunction after blood stem cell transplantation

DR. L. COPE

Methods for the analysis of gene expression data

DR. A. DE JESUS-ACOSTA

Drug development

DR. S. DENMEADE

Novel therapies for prostate cancer; urologic oncology

DR. P. DESAI

Molecular genetics of herpes simplex virus assembly and morphogenesis

DR. R. DONEHOWER

Early clinical trials of cancer therapies; GI cancers

DR. P. FORDE

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ONCOLOGY DEPARTMENT

Lung cancer; immunotherapy

DR. A. FRIEDMAN

Hematopoiesis; leukemogenesis; inflammation and cancer

DR. E. FUCHS

Tumor immunology; t-cell activation and tolerance; immunotherapy

DR. D. GLADSTONE

BMT; CLL; mantle cell lymphoma; multiple sclerosis; autoimmunity cancer

DR. C. HANN

Bladder cancer

DR. M. HOLDHOFF

Neuro-Oncology

DR. F. HOUSSEAU

Dendritic cell and innate immunity

DR. E. JAFFEE

Developing vaccine approaches that bypass mechanisms of immune tolerance in mice and patients

DR. Y. JANG

Stem cells and microenvironment; pluripotent stem cells; hepatic differentiation; liver regeneration

DR. R. JONES

Bone marrow transplantation; hematopoiesis

DR. S. KACHHAP

DNA repair; metastasis; prostate cancer

DR. H. KANG

Head and neck cancers

DR. S. KERN

Genetics of pancreatic cancer

DR. K. KINZLER

Molecular genetics of human cancer

DR. A. KLEIN

Genetic epidemiology; pancreatic cancer; cancer epidemiology; statistical genetics

DR. D. LAHERU

GI, drug development

DR. D. LE

GI cancers; immunotherapy

DR. M. LEVIS

Molecular biology of leukemia; molecularly targeted cancer therapy

DR. E. LIPSON

Melanoma

DR. L. LUZNIK

Adoptive immunotherapy of cancer; allogenic bone marrow transplantation

DR. C. MEYER

Adult sarcoma

DR. W. NELSON

Molecular mechanisms of drugs for urological cancer prevention and treatment

DR. J. NICHOLAS

Signal transducing cytokines and receptors of humanherpesvirus-8

DR. C. PALLER

Novel and natural therapeutics; combination therapies; urologic cancer

DR. N. PAPADOPOULOS

Molecular genetics of human neoplasia

DR. D. PARDOLL

Dendritic cell biology; T-cell regulation

DR. C. PRATILAS

Molecularly targeted therapy for pediatric solid tumors

DR. E. RAABE

Neural stem cell biology; pediatric brain tumors; medulloblastoma; glioblastoma; diffuse intrinsic pontine glioma; targeting stem cell factors in brain tumors

DR. K. RUBLE

Cancer survivorship

DR. M. RUDEK

Drug development; clinical pharmacology

DR. W. SHARFMAN

Malignant melanoma

DR. D. SHARMA

Breast cancer prevention; obesity-cancer axis; bioactive compounds; endocrine resistance

DR. E. SHENDEROV

Assistant Professor of Oncology and Cancer Research Immunology, JHUSOM

Member, Bloomberg-Kimmel Institute for Cancer Immunotherapy

Co-Director Prostate Cancer Multidisciplinary Clinic

Johns Hopkins Sidney-Kimmel Comprehensive Cancer Center

Research Interests: prostate cancer, immunotherapy, spatial biology

DR. M. SHOWEL

Leukemia; All research

DR. D. SMALL

Molecular biology and molecular targeting of leukemia; leukemia stem cells

DR. D. SMITH

Myeloid malignancies (AML, CML, MDS); cancer stem cell biology

DR. V. STEARNS

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ONCOLOGY DEPARTMENT

Breast cancer

DR. S. SUKUMAR

Molecular genetics of breast cancer

DR. L. SWINNEN

Lymphoma; viral oncology; neoplasia and immunodeficiency; Epstein Barr virus

DR. H. SYMONS

Immunobiology of bone marrow transplantation; alternative donor bone marrow transplantation for malignant and nonmalignant diseases

DR. V. VELCULESCU

Genomic analyses of human cancer

DR. K. VISVANATHAN

Genetic oncology; breast cancer

DR. B. VOGELSTEIN

Exploring and exploiting the genetic alterations in human cancers

DR. N. WAGNER-JOHNSTON

Lymphoma

DR. A. WOLFF

Breast cancer; novel therapies; biomarkers; survivorship; guidelines

DR. S. YEGNASUBRAMANIAN

Molecular genetics and epigenetics of cancer; DNA methylation

DR. C. A. ZAHNOW

Mouse models and epigenetic therapeutic approaches for epithelial cancers

DR. E. ZAMBIDIS

Developmental biology of human hematopoietic and vascular stem cells; embryonic stem cell biology; regenerative medicine; stem cell transplantation; cancer stem cells

DR. L. ZHENG

GI cancers (pancreatic, colon, and liver); vaccines and immunotherapy; molecularly targeted therapies

DR. S. ZHOU

Experimental cancer therapeutics

## OPHTHALMOLOGY

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ME:280.699

### CLINICAL ELECTIVE IN OPHTHALMOLOGY

**Course Type:** Tutorial

**Department/Division:** Ophthalmology

**Course Directors:** Dr. Henry Jampel

**Faculty:** Dr. Henry Jampel and departmental staff

**Contact Information:** Andrea Everett, [aevere12@jhu.edu](mailto:aevere12@jhu.edu)

**Availability/Duration:** All year; 4 weeks; register at least one month before start of elective

**Drop Period:** 2 weeks

**Description:** Supervised clinical experience in the diseases of the eye, including retinal disease, macular disease, cataracts, corneal disease, strabismus, glaucoma, ophthalmic plastic surgery, emergency room, refractive surgery, and pediatric ophthalmology. The course includes daily tutorials, reading assignments, lectures, and seminars as well as observation of eye surgery, attendance at private offices of part-time Wilmer faculty as well as clinical experience with full time Wilmer faculty, library research and oral presentation on clinical topic. Major topics in ophthalmology will be reviewed as well as the diagnostic and therapeutic approaches to most of the common eye problems presenting to ophthalmic and nonophthalmic physicians.

### ADVANCED WORK AND RESEARCH IN OPHTHALMOLOGY AND NEUROSURGERY

**Course Type:** Basic Research

**Department/Division:** Ophthalmology

**Course Director:** Dr. Henry Brem

**Telephone Number:** 410-614-0477

**Faculty:** Dr. H. Brem

**Availability/Duration:** To be arranged with preceptor; individually tailored

**Drop Period:** None

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Research in angiogenesis immunology and controlled drug delivery

### CLINICAL NEURO-OPHTHALMOLOGY

**Course Type:** Consultation Service

**Department/Division:** Ophthalmology

**Course Director:** Dr. Amanda Henderson

**Telephone Number:** 410-955-8679

**Faculty:** Drs. Amanda Henderson, Andrew Carey, Neil Miller, Shahnaz Miri

**Availability/Duration:** All year; minimum of 4 weeks. Dates must be negotiated at least 3 months in advance for visiting students.

**Prerequisite(s):** Preferably neurology (or neurosurgery) and ophthalmology general electives; special considerations will be made for some students who have only taken one of the above.

**Drop Period:** 2 months

**Description:** Patients with presumed or proven neuro-ophthalmological disorders are evaluated and managed. Literature concerning specific syndromes encountered will be discussed, both during the clinic and at evening rounds. Journal club is held once a month. Students are expected to participate in all aspects of the clinics and rounds.

### ELECTIVE IN OCULOPLASTIC SURGERY

**Course Type:** Clinical Clerkship

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OPHTHALMOLOGY

**Department/Division:** Ophthalmology/Oculoplastics

**Course Director:** Dr. Ashley Campbell

**Telephone Number:** 410-955-1112

**Faculty:** Dr. Ashley Campbell, Dr. Nicholas Mahoney, and Dr. Fatemeh Rajaii

**Availability/Duration:** All year; 4 weeks

**Drop Period:** 1 month

**Description:** The one-month elective in Oculoplastic Surgery provides clinical and surgical experience for the medical student in this subspecialty. Three days a week will be spent in clinic and two days in the operating room. At all times, the student will be directly supervised by one of the faculty in the Division of Ophthalmic Plastic and Reconstructive Surgery. In the clinic there will be the opportunity to observe the evaluation and management of patients presenting with all aspects of Oculoplastic disease including trauma, neoplasia, aging, and congenital defects involving the ocular adnexae seen. There will be opportunity to do portions of the workups and then present to the preceptor(s). In the operating room, there will be observation of surgical techniques and opportunity to scrub in and assist on cases. There is also an opportunity to participate in research with the faculty.

#### SIGNAL ACQUISITION AND PROCESSING IN OPHTHALMIC OPTICS

**Course Type:** Basic Research

**Department/Division:** Ophthalmology/Pediatric Ophthalmology and Adult Strabismus

**Course Director:** Dr. Boris Gramatikov

**Contact:** 443-287-0073; [bgramat@jhmi.edu](mailto:bgramat@jhmi.edu)

**Faculty:** Dr. Gramatikov

**Availability/Duration:** By arrangement; 4 ½ weeks

**Prerequisites:** Some background in ophthalmology, math, physics/optics, computer programming, and/or statistics would be desirable.

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This elective provides the student with an introduction to the physical principles, hardware design, and signal processing techniques used in ophthalmic optics and electronics. The course is designed for students who wish to pursue research in ophthalmic optics. Emphasis will be placed on low-power lasers, retinal scanning, optical sensors, amplifiers and filters, noise reduction, pattern recognition and data analysis in time, and frequency domains, as well as decision making rules based on statistical data. The project may include elements of computer programming, modeling, and optimization; possibly also implementing algorithms for diagnostics. Experimental data will be collected, analyzed, and statistically assessed. The end goal is to develop algorithms to be applied in functional and reliable diagnostic therapeutic devices in the field of ophthalmology or neuro-ophthalmology.

Student will be expected to write a formal report and will be evaluated on their ability to plan and carry out their project independently.

#### CLINICAL ELECTIVE IN OPHTHALMOLOGY –GREEN SPRING STATION

**Course Type:** Clinical Clerkship

**Department/Division:** Ophthalmology/Green Spring Station

**Course Director:** Dr. Kraig S. Bower

**Contact:** Rebecca Scarborough at 410-583-2843 for availability

**Faculty:** Dr. K. Bower and Dr. A. Jun

**Availability/Duration:** By arrangement; 3 or 4½ weeks

**Prerequisites:** Medical student in clinical years

**Drop Period:** One month

**Description:** Supervised clinical rotation with full time Wilmer faculty at Green Spring Station. This course will focus on diagnosis and treatment of many common eye diseases, with particular attention to conditions of the anterior segment, including cataract, cornea, and refractive surgery. Curriculum will include clinical experience, observation in the operating room and during laser refractive surgery, reading assignments, lectures and seminars, and one-on-one teaching.

### CLINICAL ELECTIVE IN OPHTHALMOLOGY- ODENTON/COLUMBIA

**Course Type:** Clinical Clerkship

**Department/Division:** Ophthalmology/Anterior Segment/Odenton/Columbia

**Course Directors:** Drs. Divya Srikumaranan

**Contact:** Dr. Divya Srikumaran; [dsrikum1@jhmi.edu](mailto:dsrikum1@jhmi.edu)

**Faculty:** Divya Srikumaran, M.D.

**Availability/Duration:** By arrangement; 3 weeks or longer

**Prerequisites:** Medical student in clinical years

**Drop Period:** One month

**Description:** Supervised clinical rotation with full time Wilmer faculty at Odenton and Columbia sites. This course will focus on diagnosis and treatment of many common eye diseases, with particular attention to conditions of the anterior segment, including cataract and cornea. Curriculum will include clinical experience and the development of basic ophthalmic examination skills as well as observation in the operating room. Students will have the opportunity to develop research projects if interested in the medical education, cornea, or trauma. Should have transportation to get to satellite locations.

### INVESTIGATING THE GENETIC BASIS OF INHERITED OCULAR DYSTROPHIES

**Course Type:** Research

**Department/Division:** Ophthalmology/Anterior Segment

**Course Directors:** S. Amer Riazuddin, Ph.D.

**Contact:** 600 N. Wolfe Street, Maumenee 809A; 410 955 3656, [sriazud1@jhmi.edu](mailto:sriazud1@jhmi.edu)

**Faculty:** S. Amer Riazuddin, Ph.D.

**Availability/Duration:** By arrangement with preceptor, individually tailored

**Prerequisites:** None

**Drop Period:** One month

**Description:** Over the course of the rotation, the student will be introduced to a multifaceted approach to determine the genetic basis of different inherited ocular dystrophies including Fuch corneal dystrophy, congenital cataracts, primary congenital glaucoma, Retinitis pigmentosa, etc. The student will rotate under the supervision of Dr. Riazuddin and will be assisted by senior postdoctoral fellows Drs. Khan and Ali. The student will be exposed to various techniques commonly used in genetic analysis including but not limited to genome-wide linkage analysis using STR or SNP markers, next generation whole exome sequencing, etc.

The goal of the rotation is an understanding of the overall approach to decipher genetic determinants responsible for inherited dystrophies and the completion of a research project to generate a meeting abstract submission and/or paper.

### ARGUS II RETINAL IMPLANT, INTRACORTICAL VISUAL PROSTHESIS, AND ULTRA-LOW VISION ASSESSMENT

(Re-creating vision for patients blind from end-stage vision loss)

**Course Type:** Clinical Research

**Department/Division:** Ophthalmology/SOM

**Course Director:** Gislin Dagnelie, Ph.D.

**Contact:** Arathy Kartha (postdoctoral fellow), 443-287-0072, [akartha2@jhmi.edu](mailto:akartha2@jhmi.edu)

**Faculty:** Drs. James Handa, Judith Goldstein, and Gislin Dagnelie,

**Availability/Duration:** Course available year round

**Prerequisites:** Undergraduate Neuroscience or equivalent

**Drop Period:** One month

**Description:** The Argus II retinal prosthesis system was approved for clinical implantation in patients blind from end-stage retinitis pigmentosa in 2013 and is now being implanted clinically at the Johns Hopkins Wilmer Eye Institute and other centers in the US and Europe until April 2020. At Wilmer we have been working with Argus II recipients since the start of the FDA-supervised feasibility study in 2007 and continue testing a small group of dedicated Argus II users.

In a separate development, in collaboration with colleagues at the Illinois Institute of Technology, University of Chicago, and University of Texas in Dallas, we are preparing the initial implantation and evaluation of a modular intracortical visual prosthesis (ICVP) for patients in whom the functional connection from retina to visual cortex has been lost. Over the next 3 years we expect to implant and evaluate 5 patients in a first-in-human feasibility study of a wireless modular visual prosthesis.

In conjunction with these visual prosthesis studies, we are developing assessments for ultra-low vision, i.e., vision too limited to allow assessment with letter charts and other standard clinical tools. Such vision levels are often considered non-functional, but in fact are used for orientation and many other elementary daily activities. We are calibrating patient-reported outcome measures and virtual reality-based performance measures in this population, supported by several NIH grants.

This elective will offer medical students and graduate students in related fields (Optometry, Biomedical Engineering), with an interest in ophthalmology and or rehab medicine, an opportunity to participate in the evaluation, treatment, and rehabilitation of patients with end-stage eye disease as they prepare for and go through experimental vision restoration trials and the subsequent rehabilitation process.

The opportunity for a participating student will not be limited to a 6-to-8-week (summer) elective but can extend throughout the year and will include opportunities to participate in studying novel aspects of prosthetic and ultra-low vision.

### **PEDIATRIC OPHTHALMOLOGY AND STRABISMUS**

**Course Type:** Clinical Research

**Department/Division:** Ophthalmology/Strabismus and Pediatric Ophthalmology

**Course Director:** Dr. Courtney Kraus

**Contact:** Dr. Courtney Kraus (919) 697-0450 or [ckraus6@jhmi.edu](mailto:ckraus6@jhmi.edu)

**Faculty:** Dr. Courtney Kraus and Dr. Alex Cristoff

**Availability/Duration:** To be arranged with Preceptor; individually tailored

**Prerequisites:** None

**Drop Period:** One month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Over the course of the rotation, the medical student will be introduced to a multifaceted approach to pediatric ophthalmology across two different clinic settings and the operating room. The goal of the rotation will be to familiarize the student with academic pediatric ophthalmology practice. The two clinic settings will encompass an “attending” clinic as well as a “resident” clinic. In addition, weekly time in the operating room will be anticipated.

The goal of this rotation will be to gain an understanding of strabismus and strabismus surgery. Through work with Dr. Kraus, a research project on the impact of SES outcomes following strabismus surgery will be planned. There will be built in independent research days for the student to work on data acquisition, analysis, and writing.

The goal of the rotation is an understanding of pediatric ophthalmology and strabismus and the completion of a research project to generate a meeting abstract submission or paper.

### **GLAUCOMA CLINICAL RESEARCH ELECTIVE**

**Course Type:** Clinical Research

**Department/Division:** Ophthalmology/Glaucoma

**Course Director:** Dr. Pradeep Ramulu, [pramulu@jhmi.edu](mailto:pramulu@jhmi.edu)

**Contact:** Rhonda Miller, [rhmiller@jhmi.edu](mailto:rhmiller@jhmi.edu)

**Faculty:** Dr. Pradeep Ramulu, Dr. Harry Quigley, Dr. Jithin Yohannan, Dr. Thomas Johnson, Dr. Elyse McGlumphy, Dr. Mona Kaleem, Dr. Jella An, Dr. Ian Pitha and Dr. Henry Jampel

**Availability/Duration:** Preferred to spend at least 2 months' time, though shorter periods might be considered

**Prerequisites:** None

**Drop Period:** One month



**Description:** A research elective is offered through the glaucoma division with an emphasis on clinical research. While longer periods of time are preferred (i.e., 6-12 months), many students have been productive during shorter periods of time (i.e., 2-3 months). Per the student's preference, the elective may involve chart review, interactions with research subjects (i.e., visual testing, questionnaire administration, ocular imaging), statistical analysis and manuscript writing. Opportunities for overseas work are also occasionally available. Several research topics are also available for study, depending on the student's interest, including: defining glaucoma, analyzing treatment/surgical outcomes, using deep learning and artificial intelligence to predict disease outcomes, imaging the optic nerve, analyzing adherence to glaucoma therapy, and understanding the functional consequences of glaucoma on the individual. Interested students should inquire with Dr. Ramulu, who would be happy to meet with any student, and circulate the application to interested mentors within the Division.

### CLINICAL/RESEARCH ELECTIVE IN OPHTHALMOLOGY – BETHESDA CAMPUS

**Course Type:** Tutorial

**Department/Division:** Ophthalmology

**Course Directors:** Dr. Mona Kaleem & Dr. Jella An

**Faculty:** Bethesda Faculty

**Contact Information:** Dr. Mona Kaleem, mkaleem1@jhmi.edu

**Availability/Duration:** All year, 4 week elective, register at least one month before start of the elective.

**Prerequisites:** Enrollment in a U.S. allopathic or osteopathic medical school

**Drop Period:** One month

**Description:** Supervised clinical experience in the diseases of the eye, including retinal disease, macular disease, cataracts, corneal disease, strabismus, glaucoma, ophthalmic plastic surgery, neuro-ophthalmology, and pediatric ophthalmology. Clinical work will be mixed in with a research component. The course includes tutorials, reading assignments, lectures, a research assignment and seminars as well as observation of eye procedures in the clinic and operating room, and oral presentation on clinical topics. Major topics in ophthalmology will be reviewed as well as the diagnostic and therapeutic approaches to most of the common eye problems presenting to ophthalmic and non-ophthalmic physicians.

### RESEARCH OPPORTUNITIES

**Medical Retina:** Dr. Sharon Solomon

**Cornea/Cataract:** Dr. Oliver Schein, Dr. Irene Kuo, Dr. Robert Weinberg, Dr. Esen Akpek, Dr. Shameema Sikder, Dr. Allen Eghrari, Dr. Uri Soiberman

**Clinical neuro-ophthalmology:** Drs. Neil Miller, Amanda Henderson, and Andrew Carey

**Pathophysiology of Eye Movement Disorders and Nystagmus:** Dr. David Zee

**Ocular Tumors; Methods of Diagnosis and Treatment:** Dr. James Handa

**Oculoplastics:** Dr. Nicholas Mahoney and Dr. Emily Li

**Ocular Epidemiology:** Dr. Sheila West, Dr. Oliver Schein, Dr. Pradeep Ramulu

**Sickle Cell Eye Disease:** Dr. Adrienne Scott

**Angiogenesis Research and Controlled Drug Delivery:** Dr. Henry Brem

**Uveitis; Scleritis, Autoimmune Diseases of the Eye:** Dr. Jennifer Thorne, Meghan Berkenstock

**Surgical Retina:** Dr. Peter Campochiaro, Dr. Peter Gehlbach, Dr. Jim Handa, Dr. Adrienne Scott

**Retinal Molecular Biology:** Dr. Don Zack

**Surgical Education:** Dr. Shameema Sikder

Pediatric ophthalmology and adult strabismus: Dr. Megan Collins

Pediatric ophthalmology and Public Health and/or Health care policy: Dr. Megan Collins

Health care equity / social determinants of health: Dr. Megan Collins

Medical ethics and professionalism: Dr. Megan Collins

Engineering in Ophthalmology: Dr. Peter Gehlbach

Contact preceptor to arrange research.

## PATHOLOGY

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### DIAGNOSTIC CYTOPATHOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Cytopathology

**Course Director:** Dr. Syed Ali

**Telephone Number:** 410-955-1180

**Faculty:** Dr. Ali and staff

**Availability/Duration:** 1 quarter or shorter; arrange with course director

**Prerequisite(s):** Introduction to Pathology

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** An opportunity to learn about the clinical significance of morphologic changes in cells and other elements of the cytologic specimen in health and in disease. The materials utilized are specimens from the Johns Hopkins Hospital Diagnostic Cytopathology Service, including Pap tests and biopsies from the Fine Needle Aspiration (FNA) Service. There will be an active correlation of the clinico-radiologic, cytomorphologic and histopathologic findings and follow-up information.

### GYNECOLOGIC PATHOLOGY

**Course Type:** Tutorial

**Department/Division:** Gynecologic Pathology

**Course Director:** Dr. Russell Vang

**Faculty:** Dr. Russell Vang and faculty

**Availability/Duration:** Negotiable; also offered as a 4-week elective

**Prerequisite(s):** Permission of instructor

**Drop Period:** 1 month

**Description:** Students observe and participate in the gross and histological assessment of gynecologic pathology specimens under the supervision of residents, fellows, and attendings.

### AUTOPSY PATHOLOGY – JHH

**Course Type:** Clinical Elective

**Department/Division:** Pathology

**Course Director:** Dr. David Nauen

**Telephone Number:** 410-955-3765

**Faculty:** Dr. Nauen, others

**Availability/Duration:** All year except July. Available as either a full quarter rotation or as a one-month rotation if followed by pathology elective.

**Prerequisite(s):** Completion of Genes to Society

**Drop Period:** 2 months

**Description:** Students are trained to function as first year house officers on the autopsy service. They become responsible for work-up and sign-out of their cases and in other respects participate fully in the life of the department. There are informal case conferences at the autopsy table and at multi headed microscopes. Students have the opportunity to present cases at departmental and interdepartmental conferences or to write cases for publication. Brief supplementary exposures to other aspects of pathology (general surgery pathology, surgical pathology subspecialties, forensic pathology, and clinical pathology) are offered to students who enroll for a full quarter.

### CLERKSHIP IN SURGICAL PATHOLOGY – JHH

**Course Type:** Clinical Clerkship

**Department/Division:** Surgical Pathology

**Course Director:** Dr. Marissa White, [mwhite44@jhmi.edu](mailto:mwhite44@jhmi.edu)

**Telephone Number:** 410-614-3653

**Faculty:** Dr. White and staff

**Availability/Duration:** All year; ½ quarter or negotiable as arranged with course director; Visiting Medical Students accepted upon approval of course director

**Prerequisite(s):** Completion of Introduction to Pathology or Genes to Society

**Drop Period:** 2 months

**Description:** Students are trained in the techniques of general surgical pathology and then become responsible for the gross description, gross dissection, and microscopic examination of their assigned cases. Students are supervised by faculty members and senior residents, and they participate in all conference activities in the division. The elective exposes the student to a variety of modern techniques employed in the pathologic diagnosis of medical and surgical diseases and increases their awareness and understanding of the role played by surgical pathology in patient management. There are opportunities for exposure to other diagnostic pathology services (e.g., cytopathology and neuropathology)

### SURGICAL PATHOLOGY - BAYVIEW MEDICAL CENTER

**Course Type:** Clinical Clerkship

**Department/Division:** Pathology

**Course Directors:** Dr. Kevan Salimian

**Telephone Number:** 410-550-5587

**Faculty:** Dr. Salimian and staff

**Availability/Duration:** All year; ½ quarter or full quarter; Visiting Medical Students accepted upon approval of Course Director

**Prerequisite(s):** Introduction to Pathology or Genes to Society

**Drop Period:** 2 months

**Description:** This course offers an opportunity to see and experience at first hand a wide spectrum of activities in anatomic pathology. Students will rotate in Surgical Pathology, functioning at the level of a first-year resident in pathology. The student will perform gross dissections, dictate clinical summaries, review microscopic sections, and sign out the surgical pathologic material under senior staff supervision.

### VIRTUAL SURGICAL PATHOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Pathology

**Course Director:** Dr. Marissa White

**Telephone Number:** Dr. Marissa White, 410-614-3964, [mwhite44@jhmi.edu](mailto:mwhite44@jhmi.edu)

**Faculty:** Dr. Marissa White, Dr. Marc Halushka, Dr. Liz Thompson

**Availability/Duration:** All year; ½ quarter or negotiable as arranged with course director; Visiting Medical Students accepted upon approval of course director

**Prerequisite(s):** N/A

**Drop Period:** 1 month

**Description:** Online surgical pathology student rotation for medical students who have completed the pre-clinical curriculum. This case-based rotation is designed to simulate a surgical pathology resident experience and will include remote previewing and sign-out of scanned cases multiple times per week with surgical pathology faculty and/or senior residents. Assigned reading will guide independent or group case previewing. Rotators will also be expected to attend surgical pathology meetings hosted on Zoom including pathology grand rounds, daily QA conferences, live sign-outs, and resident lectures. Rotators will be evaluated at the end of the rotation in the form of a brief 10-minute presentation on a pathology topic and a short assessment. At the end of the course students will:

- Summarize the role of a general surgical pathologist as a member of the multidisciplinary care team
- List the defining histologic features of several common pathologic entities
- Demonstrate how to determine the pathologic stage for an oncologic resection
- Describe how to approach assessing biopsy specimens

## CLINICAL CHEMISTRY

**Course Type:** Tutorial

**Department/Division:** Pathology/Clinical Chemistry

**Course Director:** Dr. Daniel Chan

**Telephone Number:** 410-955-2674

**Faculty:** Dr. Chan and staff

**Availability/Duration:** All year; to be arranged with instructor

**Prerequisite(s):** Third- or fourth-year medical student; completion of Introduction to Pathology

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course will provide an introduction to the clinical and research activities of the Clinical Chemistry Division. Clinical aspects will focus on the analytical methods, quality assurance and the clinical interpretation of biochemical, immunological, and proteomics tests. Laboratories include: automated chemistry, critical care, emergency department, immunoassay for hormones and tumor markers, toxicology, and therapeutic drug monitoring. Research aspects will focus on clinical proteomics through interaction with the biomarker discovery laboratory. Students will meet with individual faculty members, attend laboratory meetings, rotate in the laboratories, and be involved in research projects.

## MEDICAL MICROBIOLOGY

**Course Type:** Other (Laboratory Rotation)

**Department/Division:** Pathology/Microbiology

**Course Director:** Dr. Karen Carroll

**Telephone Number:** 410-955-5077 (Paula Mister)

**Faculty:** Dr. Karen Carroll and faculty within the Division of Medical Microbiology

**Availability/Duration:** All year; 4 weeks, limited to two students per quarter

**Prerequisite:** Basic knowledge of Microbiology

**Drop Period:** 1 month

**Description:** Laboratory diagnosis of infectious diseases and detection of antimicrobial resistance. Visiting Medical Students accepted upon approval of Course Director and must arrange times directly with the Education Coordinator, Paula Mister.

This course will emphasize all facets of diagnostic testing. The student will review specimen collection guidelines as they pertain to microbiology samples. Diagnostic methods and specific technologies for detection of a broad range of clinically significant pathogens will be learned. Susceptibility testing methods including tests designed to detect resistance mechanisms will be covered. A major objective is to provide correlation of laboratory information with disease presentations in patients through a dynamic interface with healthcare providers and other divisions within the Department of Pathology. Learning objectives are fulfilled through bench rotations in the laboratory, daily work rounds, didactics, and interdisciplinary conferences.

## FORENSIC PATHOLOGY - OFFICE OF THE CHIEF MEDICAL EXAMINER

**Course Type:** Other

**Department/Division:** Pathology

**Course Director:** Dr. Nikki Mourtzinou, Program Director, 900 West Baltimore St, Baltimore, MD 21223 (BioPark)

**Telephone Number:** 410-333--3353

**Faculty:** Staff

**Availability/Duration:** All year; 4 weeks or one quarter; only one student rotating at any given time unless approved. To request approval contact Eleanor Thomas at 410-333-8159 or [thomase@ocmemd.org](mailto:thomase@ocmemd.org). **Visiting medical students must follow JHUSOM quarter dates**

**Prerequisite(s):** Completion of Introduction to Pathology

**Drop Period:** 1 month

**Description:** Students will acquire first-hand knowledge of legal medicine by participating in regular functions of the Office of the Chief Medical examiner. Included are investigations of sudden, unexpected, and violent deaths, autopsy procedures, and toxicological and histological studies. Students are encouraged (after adequate orientation) to assist at autopsies, to participate in on-the-scene investigations, and to observe staff members testifying in court. They participate in daily rounds, lectures, and seminars. There are also opportunities to participate in on-going research projects centered on forensic pathology.

### BLOOD BANK/ TRANSFUSION MEDICINE

**Course Type:** Tutorial or Clerkship

**Department/Division:** Pathology/Transfusion Medicine

**Course Director:** Dr. Evan Bloch

**Telephone Number:** 410-614-4246

**Contact:** Lorraine Blagg, 410-502-9584 or [lblagg1@jhmi.edu](mailto:lblagg1@jhmi.edu) or [ebloch2@jhmi.edu](mailto:ebloch2@jhmi.edu)

**Faculty:** Dr. Evan Bloch and technical staff

**Availability/Duration:** All year, usually 1 month.

**Prerequisite(s):** Introduction to Pathology

**Drop Period:** 1 month

**Description:** This course provides an opportunity for medical students to gain experience in transfusion medicine {TM} in one of the largest and most academically productive TM services in the country. Students will learn about different types of blood products (i.e., indications, manipulation, and management of adverse effects) as well as approaches to patients with complex transfusion requirements (e.g., hyperhemolysis, severe alloimmunization) or who are unwilling to be transfused. Students will have an active role in clinical consultations in the TM and apheresis services. Those with an interest in research are encouraged – but not required – to pursue projects with the TM faculty and technical staff. Collectively, this elective will enhance the ability to manage patients in diverse clinical settings. It is particularly recommended for students who are interested in pathology, surgery, anesthesiology, hematology, oncology, and intensive care medicine.

### VIRTUAL BLOOD BANK/TRANSFUSION MEDICINE

**Course Type:** Tutorial or Clinical Clerkship

**Department/Division:** Pathology /Transfusion Medicine

**Course Director:** Dr. Evan Bloch

Telephone Number: 410-614-4246

**Faculty:** Evan Bloch, [ebloch2@jhmi.edu](mailto:ebloch2@jhmi.edu), Lorraine Blagg, 410-502-9584 or [lblagg1@jhmi.edu](mailto:lblagg1@jhmi.edu)

**Availability/Duration:** All year, usually 2-4 weeks

**Prerequisite(s):** N/A

**Drop Period:** 1 month

**Description:** This course provides an opportunity for medical students to gain experience in transfusion medicine. Students will learn about different types of blood components (i.e., indications, manipulation, and management of adverse effects) as well as approaches to patients with complex transfusion requirements (e.g., hyperhemolysis, severe alloimmunization) or who are unwilling to be transfused. Independent assigned reading and viewing of recorded presentations will prepare the learner for the rotation. Rotators will be expected to attend transfusion medicine meetings, teaching sessions, and case study reviews hosted on Zoom. Rotators will be evaluated at the end of the rotation in the form of a brief knowledge assessment examination and evaluation of participation in live learning activities. At the end of the course students will:

- Describe available blood components and their indications
- Summarize laboratory methods utilized in pre-transfusion testing
- Explain the clinical implications of antibodies to red blood cell antigens
- Differentiate types of adverse reactions to transfusion
- Recommend appropriate transfusion management strategies

### NEUROPATHOLOGY

**Course Type:** Tutorial

**Department/Division:** Pathology/Neuropathology

**Course Director:** Dr. Juan Troncoso

**Telephone Number:** 410-955-5632

**Faculty:** Drs. Juan Troncoso, David Nauen, Charles Eberhart, Cherry Ho and Meaghan Morris

**Availability/Duration:** 1 month or longer; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Introduction to Pathology. Approved neuroanatomy and histology.

**Drop Period:** 1 month

### ENROLLMENT LIMITED TO US MEDICAL STUDENTS ONLY

**Description:** An opportunity to learn the fundamentals of diagnostic neuropathology. The student will examine brain and spinal cord specimens obtained at Hopkins and the Office of the Chief Medical Examiner and will also participate in the evaluation of surgical neuropathology specimens from the inpatient and outside consultation services. Self-study materials and individual tutoring sessions on special topics in neuropathology are available. Students are encouraged to identify small research projects in their areas of interest. This experience is recommended for students interested in pathology, neurology, and neurosurgery.

### RESEARCH OPPORTUNITIES

DR. SYED ALI

Cytopathology; digital photoimaging; web-based teaching tools

DR. ROBERT ANDERS

Tumor immunology, tumor immune microenvironment, liver, and gastrointestinal pathology

DR. LOIS AREND

Pathology of native and transplanted kidney

DR. PEDRAM ARGANI

Breast cancer, gall bladder, and bile duct carcinomas; pediatric renal tumors

DR. SERENA BAGNASCO

Pathology of native and transplanted kidney

DR. ALEXANDER BARAS

Machine learning/artificial intelligence applied to biological sequences and biomedical imaging; urological and gynecological pathology

DR. EVAN BLOCH

Transfusion transmitted infections; Babesiosis; global blood transfusion safety; international health

DR. MICHAEL BOROWITZ

Leukemia and lymphoma, especially pediatric leukemia; flow cytometry

DR. KAREN CARROLL

Diagnostic test development and evaluation for bacteria with emphasis on healthcare associated infections

DR. PATRIZIO CATUREGLI

Autoimmune diseases; thyroiditis; hypophysitis; mouse models

DR. DANIEL CHAN

Tumor markers; proteomics; immunoassay

DR. DANIELA CIHAKOVA

Immunology, cardiac inflammation, myocarditis, dilated cardiomyopathy, myocardial infarction, T cells, Macrophages, Innate lymphoid cells, cytokines

DR. ASHLEY CIMINO-MATHEWS

Breast cancer, tumor immune microenvironment

DR. WILLIAM CLARKE

Therapeutic drug monitoring; clinical toxicology; drug assay development, point-of-care testing

DR. ANGELO DE MARZO

Molecular pathogenesis of prostate cancer

DR. CHARLES EBERHART

Pathogenesis of brain and eye tumors

DR. JONATHAN EPSTEIN

Genitourinary pathology

DR. JAMES ESHLEMAN

Early detection of pancreatic cancer; genes causing familial pancreatic cancer; liquid biopsy for patients with solid tumors; targeting cancer based on its genotype; novel molecular tools for cancer

DR. SUSAN ESHLEMAN

HIV genetic diversity, transmission, and drug resistance; novel methods for HIV analysis

DR. MARY GLENN FOWLER

Prevention of mother and child transmission of HIV; treatment of pediatric HIV infection; and prevention among high-risk adolescents and women in international settings

DR. EDWARD GABRIELSON

Molecular pathology of breast and lung cancer

DR. CHRISTOPHER GOCKE

Molecular diagnostics and hematopathology

DR. MICHAEL GOGGINS

Pancreatic cancer, particularly early detection; cancer genetics; cancer epigenetics

DR. MARY KATE GRABOWSKI

Human immunodeficiency virus, epidemiology, pathogen phylogenetics, international health

DR. MARC HALUSHKA

Cellular expression and cardiovascular disease

DR. ABDU HAMAD

Type I diabetes, underlying mechanisms and innovative therapeutic strategies, role of B cells and Natural killer T cells

DR. RALPH H. HRUBAN

Cancer of the pancreas

DR. CHIEN-FU HUNG

Cancer vaccine; immunotherapy; DNA vaccine

DR. PETER ILLEI

Pulmonary pathology and cytopathology

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PATHOLOGY



DR. AARON JAMES

Bone biology, bone repair, mesenchymal stem cells, bone tumors

DR. CLAIRE KNEZEVIC

Critical care testing, TDM/toxicology, Mass Spectrometry

DR. VASSILIS KOLIATSOS

Traumatic brain injury, traumatic axonopathy; stem cell therapies for neural injury

DR. SCOTT KRUMMEY

Transplant immunology, high-dimensional flow cytometry for immune profiling of transplant patient populations, histocompatibility, HLA antibody testing

DR. H. BENJAMIN LARMAN

High throughput molecular assay development, human immunology, autoimmunity

DR. TATIANNNA LARMAN

Intestinal epithelial biology, intestinal stem cell niche homeostasis, early colorectal cancer pathogenesis, GI/liver/soft tissue pathology

DR. ANNE LE

Metabolism of disease and metabolomics technologies

DR. QING KAY LI

Biomarkers in lung cancer and prostate cancer

DR. TONG LI

Molecular biology of neurobiological diseases

DR. MING-TSEH LIN

Molecular diagnosis of solid tumor

DR. TAMARA LOTAN

Prognostic and predictive molecular biomarkers for prostate cancer; PTEN/Pi3k/mTOR signaling in development and tumorigenesis; genitourinary pathology

DR. ZAHRA MALEKI

Cytopathology; Lung Neoplasms, Salivary Gland and Head and Neck Cytopathology

DR. JOSEPH L. MANKOWSKI

Comparative pathology and viral pathogenesis; neuroimmunology

DR. LEE J. MARTIN

Amyotrophic lateral sclerosis; Parkinson's disease; mitochondria; stroke; neonatal brain ischemia; cell death; apoptosis-necrosis continuum; motor neuron disease; transgenic mice

DR. MARK MARZINKE

Analytical pharmacology, laboratory automation, precision medicine and pharmacogenetics

DR. ANDRES MATOSO

Urologic pathology including rare tumors and bladder cancer

DR. ALAN MEEKER

Molecular pathology and telomere biology of prostate and other cancers

DR. HEBA MOSTAFA  
Diagnostic Molecular Virology, Viral Surveillance and Evolution

DR. JACLYN MURRY  
Prenatal and Postnatal Clinical Cytogenetics; Chromosome Microarray; delineation of genetic syndromes

DR. DAVID NAUEN  
Structure and function of human hippocampus

DR. KIYOKO OSHIMA  
Liver and biliary pathology, liver transplant pathology

DR. NICOLE PARRISH  
Antibiotic development; use of natural compounds as antimicrobials and the basis for synthetic scaffolds; diagnostic development for rapid detection of antimicrobial resistance; understanding antibiotic consumption and the relationship to development of antimicrobial resistance in both pathogens and commensal organisms

DR. NICHOLAS ROBERTS  
Pancreatic cancer, inherited cancer, in vitro and in vivo cancer models

DR. RICHARD RODEN  
Cervical cancer; ovarian cancer; papillomavirus; vaccine development; virology

DR. BRIGITTE RONNETT  
Gynecologic pathology

DR. MAX ROSARIO  
Corona Virus T cell vaccines and NK cell immunology

DR. SCHEHERAZADE SADEGH-NASSERI  
Molecular mechanisms of Antigen Processing in relation to autoimmune diseases, HIV, memory T cell longevity, and vaccine designs

DR. ALENA SAVONENKO  
Cognitive deficits in animal models of Alzheimer's, Parkinson's, and schizophrenia; testing experimental treatments for these diseases; their mechanisms, safety, and side effects

DR. JONATHAN SCHNECK  
Basic mechanisms controlling T-cell mediated immune responses; cellular engineering; adoptive immunotherapy; cellular microarray-based high-throughput analysis of immune responses

DR. KAREN SFANOS  
Cancer biology; prostate cancer

DR. IE MING SHIH  
Molecular events that drive precursor lesion to invasive cancer; Molecular targets for new therapy by exploring cancer genomics; Integrated proteogenomic analysis of human cancer

DR. TRISH SIMNER  
Clinical microbiology, antimicrobial resistance, and novel diagnostic tools for infectious diseases

DR. LORI SOKOLL  
Clinical chemistry; tumor markers; immunoassays

DR. CHARLES STEENBERGEN  
Cardiac pathology; myocardial ischemia/reperfusion injury and cardio protection

DR. SHUYING SUN  
Neurodegenerative diseases and RNA metabolism

DR. ELIZABETH THOMPSON  
Pancreatic tumors, tumor immune microenvironment, immune response to different stages of neoplasia

DR. AARON TOBIAN  
Transfusion medicine and HIV

DR. JUAN TRONCOSO  
Neuropathology of normal aging, Alzheimer's, Parkinson's, and Huntington's disease with emphasis on morphological and biochemical studies of human postmortem tissues. My laboratory has access to >2500 autopsy brains, with fixed and frozen tissues, of neurodegenerative diseases and controls (30 to 65 years of age)

DR. CHRIS VANDENBUSSCHE  
Genitourinary pathology; ancillary testing in small biopsy specimens; cytomorphologic digital analysis

DR. RUSSELL VANG  
Gynecologic pathology

DR. TIAN-LI WANG  
DNA damage repair in cancer development; Chromatin remodeling in ovarian cancer; Cancer stem cell study; Innovative cancer detection using body fluid

DR. PHILIP WONG  
Molecular mechanisms and mouse models of neurodegenerative and psychiatric diseases; experimental therapeutics

DR. LAURA WOOD  
Cancer genomics; pancreatic and liver cancers; gastrointestinal and liver pathology

DR. T.C. WU  
Cancer, immunotherapy for HPV associated malignancies and other gynecological cancers; molecular pathology and DNA vaccines

DR. RENA XIAN  
B-cell lymphoma genomics, next-generation sequencing, non-invasive diagnostics, viral-associated lymphomas

DR. DEYIN XING  
Diagnosis and molecular pathogenesis of gynecologic neoplastic and non-neoplastic lesions

DR. MARK ZARELLA  
Digital pathology, Human interpretable machine learning using histology images.

DR. HUI ZHANG  
Developing and applying high-throughput mass spectrometric technologies and data analysis pipeline for multi-omics characterization of proteins and protein phosphorylation/glycosylation

DR. SEAN ZHANG  
Medical mycology; molecular diagnosis of fungal infections

DR. ZHEN ZHANG  
Bioinformatics; biomarker discovery; computational methods for expression data analysis; biomarkers for ovarian cancer

DR. YING ZOU

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PATHOLOGY

Characterization of chromosomal structural abnormalities in leukemia and lymphoma using cytogenomics methods; Fluorescence in situ hybridization

## PEDIATRICS

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ME:320.699

### SUBINTERNSHIPS IN THE DEPARTMENT OF PEDIATRICS

#### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship

**Department/Division:** Pediatrics/Inpatient, Emergency Medicine, Harriet Lane Clinic

**Course Directors:** Drs. Amit Pahwa, Lauren Kahl and Nakyla Showell

**Telephone Number:** 410-955-5977; contact Rebekah Reisig

**Faculty:** Pediatrics Faculty

**Availability/Duration:** 4 weeks; lottery system.

**Prerequisite(s):** Core Clerkship in Pediatrics

**Drop Period:** 2 months

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

#### **Description:**

**Inpatient Pediatrics:** A subinternship experience on a ward service in the Children's Center, with primary responsibility for patients admitted to that service. Supervised by the SAR on that service, with some night shift and weekend responsibilities. This course will enhance the student's knowledge of pediatrics and provide responsibility appropriate to the level of subintern. Evaluation will be performed by ward attending and senior residents.

**Emergency Medicine:** Evaluation and treatment of children presenting to the Pediatric Emergency Department. Duties to approximate the workload of a pediatric intern- approximately 17 ten-hour shifts carrying on average three to four patients at a time.

**Harriet Lane Clinic:** The acute care Harriet Lane team sees pediatric patients aged birth to 21 years for acute complaints, newborn visits, and immunizations. Each day begins with an hour-long lecture on a topic relevant to primary care pediatrics. The subintern will perform histories and physical exams, present to the senior resident, fellow or faculty attending, participate in decisions regarding treatment plans, and communicate with the patient's primary care provider and subspecialist consultants, as necessary. The subintern will work closely with our social workers, nurses, child life specialists, legal advocates, and mental health counselors in providing care to our patients. The student will also have the opportunity to join the lactation consultant during a breastfeeding clinic session. The subintern will also participate in the monthly case conference and journal club.

### CHILD AND ADOLESCENT PSYCHIATRY

*(also listed under Psychiatry)*

**Course Type:** Clinical Clerkship

**Department/Division:** Division of Child & Adolescent Psychiatry

**Course Director:** Dr. Esther Lee

**Contact:** 410-955-7858; Josh Elliott; [jellio26@jhmi.edu](mailto:jellio26@jhmi.edu)

**Faculty:** Dr. Vasa and division faculty

**Availability/Duration:** Variable; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** This course offers the opportunity to observe and participate in a variety of clinical-teaching settings, including inpatient child and adolescent units, day hospital, consultation liaison service, outpatient specialty clinics (affective disorders, anxiety disorders, developmental neuropsychiatric disorders, psychosomatic disorders) as well as community psychiatric programs including outpatient services, community liaison, and school-based programs. The student will learn about a variety of psychiatric presentations of children, adolescents, and their families and the range of psychotherapeutic interventions available. In addition, students have the opportunity to participate in

a large number of ongoing research projects within the division. The elective is tailored to meet individual interests.

### PEDIATRIC OSLER APPRENTICESHIP

Course Type: Other

Department/Division: Pediatrics

**Course Director:** Dr. Christopher Golden & Dr. Amit Pahwa

**Contact:** Rebekah Reisig; rreisig1@jhmi.edu

**Faculty:** Dr. Christopher Golden & Dr. Amit Pahwa

**Availability/Duration:** All year; one to two students are chosen in the Spring to serve as OAs for the following academic year

**Prerequisite(s):** Pediatric Core Clerkship

Drop Period: 1 month

**ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The Osler Apprenticeship in Pediatrics is an opportunity for senior medical students with an interest in academic pediatrics. Apprenticeship allows students to gain experience and exposure to the technical, administrative, and educational skills central to pursuing a future career as an academic clinician educator.

Osler Apprentices (OAs) are medical students interested in becoming academic scholars. This Apprenticeship affords these learners the opportunity to work closely with pediatric faculty members (including the Clerkship Director, Associate Clerkship Director, and other pediatric faculty) and medical students on the Pediatrics Basic Clerkship. Responsibilities in teaching, research, or administration (as an integral part of pediatric medical education in the Department) form the foundation of the apprenticeship. OAs are expected to pursue academic scholarship through their activities, producing quantitative results (i.e., abstracts, published manuscripts) that will enhance their development as future academic pediatricians

By the end of the program, OAs will:

- Enhance their educational research skills and develop pedagogical skills.
- Acquire experience in leadership, interpersonal effectiveness, and performance evaluation.
- Obtain academic administrative experience, including supervision of Basic Clerkship students, and collaborate with pediatric medical educators (at Johns Hopkins and other institutions) on scholarly work that may result in joint scientific publications and/or attendance/presentations at national pediatric medical education meetings.

### NEURODEVELOPMENTAL PEDIATRICS - KENNEDY KRIEGER INSTITUTE

**Course Type:** Clinical Clerkship

**Department/Division:** Pediatrics

**Course Director:** Dr. Miya Asato

**Telephone Number:** 412-443-9342; [asato@kennedykrieger.org](mailto:asato@kennedykrieger.org)

**Faculty:** Dr. Asato and staff

**Availability/Duration:** Offered Q1-Q4; 1 month; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Core Clerkship in Pediatrics

**Drop Period:** 1 month

**Description:** The goal of this elective is to provide the student with an overview to neurodevelopmental disabilities including cerebral palsy, autism, intellectual disability, attention deficit hyperactivity disorder and other disorders of communication and learning. Students will actively participate in the diagnostic and interdisciplinary evaluation and management of infants, children, and adolescents with neurodevelopmental disorders. Directed readings, lectures, and regular meetings with a faculty preceptor will be used to increase the student's knowledge of principles of development, specific diagnostic entities, brain-behavior relationships, and current issues in care. This elective is recommended for those students who are considering careers in pediatrics, neurology, genetics, or psychiatry.

### CLINICAL RESEARCH ELECTIVE IN ADOPTION MEDICINE

**Course Type:** Clinical Research

**Department/Division:** Pediatrics/ACCM

**Course Director:** Dr. Deborah Schwengel

**Telephone Number:** 410-955-7610

**Faculty:** Dr. Deborah Schwengel

**Availability/Duration:** Only by specific arrangement and a short training period is required; 2-3 months.

**Prerequisite(s):** Language fluency is helpful but not required. Most important is the student's ability to function as an ambassador and be culturally sensitive. Previous experience in the third world or immersion in other cultures is ideal.

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This is a clinical research elective in which the student evaluates children in orphanages abroad. The student will weigh and measure children living in orphanages and will develop a project of special interest such as nutrition, language development, vaccines, caretaking in orphanages, etc. The student will be expected to present findings at national meetings and make a publication attempt. Expenses are paid.

#### **RESEARCH IN PEDIATRIC ALLERGY**

**Course Type:** Patient Care and/or Clinical Research

**Department/Division:** Pediatrics/Immunology

**Course Director:** Dr. Robert Wood

**Telephone Number:** 410-955-5883

**Faculty:** Dr. Robert Wood

**Availability/Duration:** All quarters; nine weeks; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** The student may attend clinic for patients with allergic (primarily food allergy and asthma) or immunologic (primarily immunodeficiency) disorders and/or participate in a variety of ongoing research studies on children with allergic or immunologic disorders. Current projects include studies on the natural history of food allergy, treatment options for food allergy, the relationship of the environment to asthma, and novel treatment approaches for childhood asthma.

#### **CLINICAL CLERKSHIP IN FULL-TERM NURSERY**

**Course Type:** Clinical Clerkship

**Department/Division:** Pediatrics/Neonatology

**Course Director:** Dr. Christopher Golden

**Telephone Number:** 410-955-4588 or 410-955-5259

**Faculty:** Dr. Golden and Nurse Practitioner staff.

**Prerequisite(s):** Core Clerkship in Pediatrics

**Availability/Duration:** All year; 4 weeks; visiting medical students must follow JHUSOM quarter dates

**Drop Period:** 1 month

**Description:** Clinical experience in the care of full-term and near-term newborns, including both normal and "at-risk" infants. Student will be expected to follow newborns and families throughout the nursery stay. On completion of the clerkship, the student should be able to: perform a newborn physical exam, including assessment of gestational age; recognize normal patterns of transition at birth; recognize risk factors for and signs of abnormal transition; identify many normal variants and abnormal findings on the newborn physical examination; understand the diagnosis and management of common neonatal problems (such as jaundice, suspected sepsis, feeding problems, congenital infections, drug withdrawal, skin rashes); understand important issues in counseling parents regarding care of the newborn. Students will have the opportunity to rotate in the Neonatal Intensive Care Unit (NICU) and to attend deliveries with the pediatric house staff and participate in resuscitation. At the end of the clerkship, students will prepare a short presentation (PowerPoint recommended) on a newborn topic of his/her choice.

## ADOLESCENT MEDICINE

**Course Type:** Advanced Clerkship/Subinternship

**Department/Division:** Pediatrics/General Pediatrics and Adolescent Medicine

**Course Director:** Dr. Maria Trent (Program Coordinator: Lynette Forrest)

**Telephone Number:** 410-614-3865

**Faculty:** Drs. H. Adger, A. Marcell, and M. Trent

**Availability/Duration:** ½ quarter (not offered June/July); visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Core Clerkships in Pediatrics and Ob/Gyn

**Drop Period:** 2 months

**Description:** Students will gain increased experience working with adolescents (ages 10-21 years). Time is primarily spent in the Adolescent Clinic with additional clinical opportunities at the Baltimore City school-based clinics, and an adolescent substance abuse treatment program. Clinical interviewing skills are emphasized, and there is a weekly didactic seminar series. A case presentation or literature review is required during the month.

## GENERAL PEDIATRICS & ADOLESCENT MEDICINE CLINICAL RESEARCH

**Course Type:** Clinical Research

**Department/Division:** Pediatrics/General Pediatrics and Adolescent Medicine

**Course Director:** Dr. Jacky Jennings

**Telephone Number:** 410-955-2910

**Faculty:** Division of General Pediatrics faculty

**Availability/Duration:** 9 weeks minimum; all year pending match with a faculty member; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Core Clerkship in Pediatrics

**Drop Period:** 1 month

**Description:** Opportunities are available for studies to participate in ongoing clinical research projects within the Center for Child and Community Health Research in the Division of General Pediatrics & Adolescent Medicine. Research opportunities exist at the East Baltimore and Bayview campuses. Division faculty provide clinical care to children, adolescents, and young adults in the Harriet Lane Clinic (including the Adolescent Medicine Clinics and Intensive Primary Care Clinic for youth with HIV infection) and the Bayview Children's Medical Practice. Students may be involved in developing critical literature reviews or pre-testing research instruments, in collecting data through interview or chart review, or in analyzing data, depending on the student's interest and previous experience and the stage of the project. Students who choose this elective will increase their depth of knowledge in at least one pediatric content area.

## CLINICAL ISSUES IN CHILD MALTREATMENT AND ADVOCACY

**Course Type:** Clinical Clerkship

**Department/Division:** Pediatrics/ Emergency Medicine

**Course Director:** Dr. Mitchell Goldstein

**Telephone Number:** 410-955-6143

**Faculty:** Dr. Mitchell Goldstein and Simone Thompson LCSW

**Availability/Duration:** All year except July and December; 3 weeks; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Core Clerkship in Pediatrics

**Drop Period:** 2 months

**Description:** The Clinical Issues in Child Maltreatment and Advocacy offers the student an intensive exposure to the many facets of caring for abused children and their families. The student will gain an understanding of the identification, evaluation, and treatment of the physically abused child in both the acute and inpatient settings. Likewise, the student will participate in the identification and evaluation of suspected sexual abuse. The student will observe the multidisciplinary approach to medical and psychological treatment of abused children and their



families; the investigation, the prosecution and treatment of perpetrators and the roles of child advocacy groups in education and prevention.

### CLINICAL CLERKSHIP IN PEDIATRIC EPILEPSY

**Course Type:** Clinical Clerkship

**Department/Division:** Pediatric Neurology

**Course Director:** Dr. Adam Hartman

**Telephone Number:** 410-955-9100

**Faculty:** Drs. Hartman and Kossoff

**Availability/Duration:** All year; 2 weeks; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Core Clerkships in Pediatrics and Neurology

**Drop Period:** 1 month

**Description:** This elective will give the student experience in the "trenches" of managing pediatric epilepsy including participation in clinic or in a more structured and intensive experience, including ward duty. There also is experience reading EEGs in both outpatient and epilepsy monitoring unit environments. The student may spend time with ketogenic diet patients and in epilepsy surgery cases, as available.

### PEDIATRIC GASTROENTEROLOGY AND NUTRITION

**Course Type:** Clinical Clerkship

**Department/Division:** Pediatrics/Gastroenterology

**Course Director:** Dr. Carmen Cuffari

**Telephone Number:** 410-955-8769

**Faculty:** Drs. Maria Oliva-Hemker, Carmen Cuffari, Ann Scheimann, Anthony Guerrerio, Christine Karwowski and Wikrom Karnsakul

**Availability/Duration:** 3rd and 4th year students; ½ quarter; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Pediatrics Core Clerkship preferred

**Drop Period:** 1 month

**Description:** Students will receive exposure to children with a wide variety of pediatric gastrointestinal, hepatic and/or pancreatic disorders as well as disorders of under and over nutrition. Students will round daily with ward team beginning at 8 a.m. from CMSC 9, M-F.

Additionally, students will be expected to participate in various divisional outpatient clinics, including General GI/Inflammatory Bowel Disease Clinic Tuesday 9 a.m. -12 p.m. and/or 1-4 p.m. General GI Clinic on Thurs. 8 a.m.-12 p.m. and Liver clinic on Friday 9 a.m.-12 p.m. Clinic is in the David M. Rubenstein Children's Health Building, Lower Level. Students are also encouraged to participate in various divisional teaching sessions. Students will be asked to present an interesting case on the last Wednesday of their rotation.

### PEDIATRIC GASTROENTEROLOGY, HEPATOLOGY AND NUTRITION AT ALL CHILDREN'S HOSPITAL

**Course Type:** Other

**Department/Division:** Pediatric Gastroenterology, All Children's Hospital (ACH), St. Petersburg, Florida

**Course Director:** Dr. Mike Wilsey

**Telephone Number:** 727-767-4106

**Faculty:** Drs. Daniel McClenathan, Michael Wilsey and Sara Kajoo

**Availability/Duration:** Rolling availability; 3-4 weeks

**Prerequisite(s):** Core Clerkship in Pediatrics or Medicine

**Drop Period:** 2 months

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The Pediatric Gastroenterology/Nutrition Department is a very active clinical service. The student will participate in the evaluation and management of children with gastrointestinal disease disorders.

Students will attend daily gastroenterology clinics at ACH and interview and examine outpatients referred for gastrointestinal disorders. Students will assist in planning the diagnostic and therapeutic program for these patients.

Students will be expected to participate in clinical gastrointestinal rounds and Gastroenterology Journal Club.

Students will observe diagnostic modalities such as endoscopy, manometry, esophageal dilation, suction rectal biopsies and pH probes. The student will be evaluated on faculty evaluations, attendance, and overall performance.

### PEDIATRIC INTENSIVE CARE

#### *SITE FOR ADVANCED CLERKSHIP IN CRITICAL CARE/ICU*

**Course Type:** Clinical Clerkship

**Department/Division:** Anesthesiology and Critical Care Medicine

**Course Director:** Dr. Erik Su

**Telephone Number:** 410-614-6598

**Faculty:** Dr. Erik Su and PICU on-service faculty

**Availability/Duration:** One student per rotation; 2-4 weeks (4 weeks preferred).

**Prerequisite(s):** Core Clerkship in Pediatrics required; clinical preceptorship in anesthesiology recommended, but not required.

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The course is designed for students planning a career in anesthesiology, pediatrics, or a pediatric surgery specialty and encourages students to become familiar with medical and surgical problems of critically ill infants and children. Basic pathophysiology and pharmacology will be stressed, along with principles of pediatric resuscitation. Students should be prepared to help contribute to the care of these patients on rounds and by following them throughout the day. Students are expected to attend daily didactic sessions and in-depth case discussions for residents and students held by the PICU faculty and fellows, as well as monthly in situ simulations in the PICU. If the student rotates for more than two weeks, there is the option of spending one to two days with the PICU transport team, during which the students may have the opportunity to attend ambulance transports of pediatric patients.

### PEDIATRIC CARDIOLOGY AT ALL CHILDREN'S HOSPITAL

**Course Type:** Other

**Department/Division:** Pediatric Endocrinology, All Children's Hospital (ACH), St. Petersburg, FL

**Course Director:** Dr. Patricia Quigley

**Telephone Number:** 727-767-4106

**Faculty:** Drs. Jamie Decker, Gul Dadlani, Thieu Nguyen, Marguerite Crawford, Gary Stapleton, and James Huhta

**Availability/Duration:** Rolling availability; 3-4 weeks

**Prerequisite(s):** Core Clerkship in Pediatrics or Medicine

**Drop Period:** 2 months

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Principles of pediatric cardiology will be taught in outpatient and inpatient encounters at ACH-JHM. As a freestanding children's hospital, patient cases will reflect both general pediatric cardiology exposure as well as exposure to highly specialized patient cases reflecting ACH-JHM's status as a quaternary care center. Participation in clinical or basic research in pediatric cardiology may also be coordinated pending project and faculty availability.

Students will attend daily cardiology clinics at All Children's Hospital Johns Hopkins Medicine. Emphasis will be placed on understanding cardiac physiology and pathophysiology of pediatric patients, physical diagnosis, and outpatient management. Principles in cardiac electrophysiology and anatomy will be taught using electrocardiography and echocardiography.

Students will participate in work up and care of cardiac patients including those admitted for diagnostic cardiac catheterization and inpatient consultation. Students will be expected to round and follow patients assigned to the cardiology team throughout the clerkship rotation.

Students are expected to participate in weekly conferences including cardiology specific conferences as well as resident noon conferences, JHUSOM Pediatric Grand Rounds and ACH-JHM Grand Rounds.

### PEDIATRIC CARDIOLOGY

**Course Type:** Consultation Service

**Department/Division:** Pediatrics/Cardiology

**Course Director:** Dr. William Reid Thompson III

**Telephone Number:** Contact Chyna Allen; 410-614-0897; [clawren@jhmi.edu](mailto:clawren@jhmi.edu)

**Faculty:** Dr. Thompson and division faculty

**Availability/Duration:** All quarters ½ or full quarter; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Core Clerkship in Pediatrics

**Drop Period:** 1 month

**Description:** Students actively participate on the service working primarily with the cardiologist on call for the month. Students attend a weekly schedule of divisional conferences and teaching seminars; videotape, tape slide and computer interactive learning resources are available.

Emphasis is placed on the following areas: acquisition of basic skills of cardiovascular assessment in infants and children; understanding the hemodynamic principles of pressure, flow, and resistance, and relating them to the clinical picture and the findings at cardiac catheterization; overview of the natural history of common congenital and acquired heart disease in infancy, childhood, and adolescence; introduction to electrocardiography and two-dimensional color and Doppler echocardiography.

### NEONATOLOGY AT ALL CHILDREN'S HOSPITAL

**Course Type:** Other

**Department/Division:** Neonatology, All Children's Hospital (ACH), St. Petersburg, FL

**Course Director:** Dr. Patricia Quigley

**Telephone Number:** 727-767-4106, Dawn Jones, [dawn.jones@jhmi.edu](mailto:dawn.jones@jhmi.edu)

**Faculty:** Drs. Roberto Sosa, Fauzia Shakeel, Anthony Napolitano, and Aaron Germain

**Availability/Duration:** Rolling availability; 3-4 weeks

**Prerequisite(s):** Core Clerkship in Pediatrics or Medicine

**Drop Period:** 2 months

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Students will be taught to provide patient care that is compassionate, appropriate, and effective for the promotion of health, prevention of illness, treatment of disease and at the end of life in the neonatal intensive care unit. Opportunities to participate in simulated resuscitative scenarios will also be available.

Students will attend the NICU follow-up clinic. Students will have the opportunity to follow nutritional, developmental, and other clinical issues on discharged neonatal patients. Students are expected to participate in daily rounds and didactic conferences and other structured learning opportunities. Students will attend JHUSOM Pediatric Grand Rounds and ACH-JHM Grand Rounds.

Students will be able to observe a variety of procedures including but not limited to sterile gowning and aseptic preparation, venipuncture, intubation, lumbar puncture, suprapubic bladder aspiration, bladder catheterization and umbilical line placement.

### ELECTIVE IN PEDIATRIC HEMATOLOGY

**Course Type:** Consultation Service

**Department/Division:** Hematology

**Course Director:** Dr. J. Casella

**Telephone Number:** 410-955-6132

**Availability/Duration:** All year; 4½ weeks; one student; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Core Clerkship in Pediatrics or Medicine

**Drop Period:** 2 months

**Faculty:** Drs. James Casella, Jeffrey Keefer, John Strouse, and Clifford Takemoto

**Description:** Clinical and laboratory experience in pediatric hematology, including assignments in clinic, ward rounds, training in morphologic hematology, and attending research and clinical seminars and conferences. Each student is requested to organize a research seminar at the end of the elective.

### ADVANCED CLERKSHIP IN PEDIATRIC ONCOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Oncology/Pediatric Oncology

**Course Director:** Dr. Stacy Cooper

**Telephone Number:** 410-614-5055, Gladys Novak

**Faculty:** Drs. Robert J. Arceci, Patrick Brown, Allen R. Chen, Alan Friedman, Christopher Gamper, David Loeb, Ido Paz-Priel, Eric Raabe, Donald Small, Heather Symons, and Elias Zambidis

**Availability/Duration:** All year; arranged with course director

**Prerequisite(s):** Core Clerkship in Pediatrics

**Drop Period:** 1 month

**Description:** Students will have the opportunity to become familiar with pediatric oncology patient care during this one-month inpatient-based rotation. The elective includes exposure and education to a wide range of oncologic conditions and complications. Students will have the opportunity to participate in the management of children with hematologic malignancies and solid tumors. In addition, students can participate in the management of pediatric bone marrow transplantation patients. Students primarily manage selected inpatients with resident, fellow, and attending supervision. Students may have the opportunity to see consults in concert with the inpatient team and to follow the progress of patients as they transition to the outpatient setting.

### PEDIATRIC HEMATOLOGY ONCOLOGY AT ALL CHILDREN'S HOSPITAL

**Course Type:** Other

**Department/Division:** Pediatric Hematology Oncology, All Children's Hospital (ACH), St. Petersburg, FL

**Course Director:** Dr. Patricia Quigley

**Telephone Number:** 727-767-4106, Dawn Jones, [dawn.jones@jhmi.edu](mailto:dawn.jones@jhmi.edu)

**Faculty:** Drs. Gregory Hale, Nanette Grana, Irmel Ayala, Neil Goldenberg, Jody Kerr, Jennifer Mayer, Damon Reed, and Stacie Stapleton

**Availability/Duration:** Rolling availability; 2-4 weeks

**Prerequisite(s):** Core Clerkship in Pediatrics or Medicine

**Drop Period:** 2 months

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The student will be involved in the diagnosis, evaluation, and management of patients with a spectrum of pediatric hematology and oncology disorders, both in the inpatient and outpatient settings at ACH.

In the outpatient setting, the student will actively participate in interviewing and examining newly referred and follow-up patients. Students will additionally gain exposure to the multi-disciplinary approach to the care of children with chronic oncologic and hematologic conditions.

The student will be an active participant in daily rounds and will be expected to interact with patients and team members. Students will develop a basic understanding of hematologic and oncologic pathophysiology as well as cancer chemotherapy. Written histories, physical examinations and plans for evaluation and treatment will be reviewed with the attending physician.

Students will attend the weekly multidisciplinary patient care and teaching rounds and monthly tumor board as well as resident noon conferences, JHUSOM Pediatric Grand Rounds and ACH-JHM Grand Rounds. Students will have the ability to participate in other settings related to the care of this population of children including the Child-life Center, infusion clinics and other related patient care settings at ACH.

### CLINICAL CLERKSHIP IN PEDIATRIC ENDOCRINOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Endocrinology

**Course Director:** Dr. David Cooke

**Telephone Number:** 410-955-6463; [dcooke@jhmi.edu](mailto:dcooke@jhmi.edu)

**Faculty:** Drs. D. Cooke, D. Long, S. Blackman, J. Crane, and K. Arcara

**Availability/Duration:** All year; 4 weeks minimum; two to three students

**Prerequisite(s):** None

**Drop Period:** 2 months

**Description:** This elective offers the student an intensive outpatient exposure to a wide variety of endocrine problems in children and adolescents. The student will gain an understanding of normal growth and sexual maturation and how these patterns are affected by endocrine disorders at different ages. Also, the outpatient management of complex chronic disease on a long-term basis is emphasized. Students have the same clinical responsibilities as residents and fellows. A research conference and clinical conference are held weekly throughout the academic year. Disorders seen include pituitary, thyroid, bone/mineral, adrenal, growth, puberty, gonad and sexual differentiation abnormalities, and diabetes.

### PEDIATRIC ENDOCRINOLOGY AT ALL CHILDREN'S HOSPITAL

**Course Type:** Other

**Department/Division:** Pediatric Endocrinology, All Children's Hospital (ACH), St. Petersburg, FL

**Course Director:** Dr. Patricia Quigley

**Telephone Number:** 727-767-4106

**Faculty:** Drs. Pallavi Iyer, Frank Diamond, Allen Root and Suzanne Jackman

**Availability/Duration:** Rolling availability; 3-4 weeks

**Prerequisite(s):** Core Clerkship in Pediatrics or Medicine

**Drop Period:** 2 months

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course offers the student in-depth exposure to a wide variety of endocrine related problems and diseases in children and adolescents.

Students will gain an understanding of the management of common and complex endocrine diseases in children of all ages. Medical management and understanding of growth physiology, sexual maturation and other hormonal processes/diseases will be emphasized. Students will additionally gain insight into the appropriate laboratory/diagnostic tests necessary to diagnose and evaluate common endocrine diseases in children.

Students will be expected to attend regularly scheduled research conferences and clinical conferences as well as JHUSOM Pediatric Grand Rounds and ACH-JHM Grand Rounds.

Students will have the opportunity to see and provide care for children with disorders including pituitary, thyroid, bone/mineral, adrenal, growth, puberty, gonad and sexual differentiation and diabetes.

### PEDIATRIC INFECTIOUS DISEASES

**Course Type:** Consultation Service

**Department/Division:** Pediatrics/Infectious Disease

**Course Director:** Dr. Kwang Sik Kim

**Telephone Number:** 410-614-3917, Candita Polk; [cpolk1@jhmi.edu](mailto:cpolk1@jhmi.edu)

**Faculty:** Dr. Kim and division faculty

**Availability/Duration:** All year; 4½ and 9 weeks; one or two students

**Prerequisite(s):** Core Clerkship in Pediatrics

**Drop Period:** 1 month

**Description:** Consultation service seeing a variety of ward, intensive care, oncologic, transplantation, neonatal and HIV-infected patients. The service also serves as primary attending on select inpatients such as meningitis. Students have primary responsibility for selected patients and will accompany the faculty and fellow on daily consultation rounds as well as participating in daily "plate rounds" in the microbiologic laboratories. Students will select a topic to study and present to the division faculty in the division's weekly conferences.

### CLINICAL RESEARCH ELECTIVE IN PEDIATRIC INFECTIOUS DISEASES

**Course Type:** Clinical Research

**Department/Division:** Pediatrics/Infectious Disease

**Course Director:** Dr. Kwang Sik Kim

**Contact:** Candita Polk; 410-614-3917, [cpolk1@jhmi.edu](mailto:cpolk1@jhmi.edu)

**Faculty:** Dr. Kim and division faculty

**Availability/Duration:** 9 weeks; all year

**Prerequisite(s):** Enthusiasm

**Drop Period:** 1 month

**Description:** Clinical research opportunities are available on a range of topics related to the pathogenesis, epidemiology, diagnosis and management of infectious diseases, patient care (including HIV-infected children), outcome assessment, critical pathways, epidemiology, antibiotic utilization, and vaccine-related issues.

### LABORATORY ELECTIVE IN PEDIATRIC INFECTIOUS DISEASES

**Course Type:** Laboratory Research

**Department/Division:** Pediatrics/Infectious Disease

**Course Director:** Dr. Kwang Sik Kim

**Contact:** Candita Polk, 410-614-3917, [cpolk1@jhmi.edu](mailto:cpolk1@jhmi.edu)

**Faculty:** Dr. Kim and Infectious Diseases faculty

**Availability/Duration:** All year; one quarter or longer; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** Regular time commitment essential

**Drop Period:** 1 month

**Description:** Laboratory projects on the biology of the blood-brain barrier in central nervous system infections, inflammation, and on HIV. Laboratory skills include tissue culture, assays for microbial interaction with the blood-brain barrier, recombinant protein expression systems, microbial genetics, microarrays, proteomics, PAGE, 2D gels and Western blots, ELISA assays, signal transduction pathways and protein biochemistry.

### PEDIATRIC DERMATOLOGY

**Course Type:** Clinical Clerkship/ Clinical Research

**Department/Division:** Pediatrics/Dermatology

**Course Director:** Dr. Bernard Cohen

**Telephone Number:** 410-955-2049

**Faculty:** Drs. Bernard Cohen and Katherine Puttgen

**Availability/Duration:** 4½ weeks; all year; visiting medical students must follow JHUSOM quarter dates

**Prerequisite(s):** See course director

**Drop Period:** 2 months

**Description:** This is an intensive clinical experience in Pediatric Dermatology. The student will participate in outpatient clinics, inpatient consults, dermatology rounds, and grand rounds. Students are also encouraged to design and complete clinical research projects and contribute to the online image resource dermatlas.org.

### VIRTUAL PEDIATRICS

**Course Type:** Other

**Department/Division:** Pediatrics

**Course Director:** Dr. Chris Golden, [cgolden@jhmi.edu](mailto:cgolden@jhmi.edu), and Dr. Amit Pahwa, [pahwa@jhu.edu](mailto:pahwa@jhu.edu)

**Faculty:** Dr. Eric Balighian, Dr. Joann Bodurtha, Dr. Ned Bartlett, Dr. Stacey Cooper, Dr. David Cooke, Dr. Bob Dudas, Dr. Joan Dunlop, Dr. Justin Jeffers, Dr. Alexander Hoon Jr., Dr. Arik Marcell, Dr. Eric Rubin, Dr. Brittany Schwarz, Dr. Jennifer Son, and Dr. Reid Thompson

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** Transition to the Wards

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** During this elective, students will learn about the care of pediatric patients through on-line coursework, didactics (in pediatric medicine and pediatric radiology), clinical reasoning exercises, virtual interviews, and oral presentations. Students will gain a better understanding of routine pediatric development, common medical problems across all ages, and strategies for evaluating children and working with families.

**Course Objectives:**

- Demonstrate ability to conduct patient interviews based on the age of the patient
- Prepare and present age-appropriate, oral presentations on pediatric patients
- Describe developmental pediatrics across the age continuum
- Evaluate a chief concern in a patient based on the age
- Choose and justify the necessary components of a history, physical exam, labs, and imaging to formulate an appropriate differential diagnosis

### ADVANCED HOSPITALIZED PEDIATRICS ELECTIVE

**Course Type:** Other

**Department/Division:** Pediatrics

**Course Director:** Dr. Christopher Golden, [cgolden@jhmi.edu](mailto:cgolden@jhmi.edu), Dr. Amit Pahwa, [pahwa@jhu.edu](mailto:pahwa@jhu.edu), and Dr. Rebekah Reisig, [rebekah@jhmi.edu](mailto:rebekah@jhmi.edu)

**Faculty:** Dr. Christopher Golden, Dr. Amit Pahwa, and Dr. Rebekah Reisig

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** Core Clerkship in Pediatrics

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Students will participate in the care of hospitalized pediatric patients at Johns Hopkins Children's Center. Students will assist the team with clinical reasoning through chart review, patient interview, and formulation of patient problems. Students will also assist with important transitions of care tasks such as medication reconciliation, discharge education, and communicating with outpatient providers. This course builds directly on core skills and learning objectives of the Pediatric Core Clerkship and will prepare students for the Subinternship in Hospitalized Pediatrics. Students will round with teams daily via Zoom and use remaining time for other patient related tasks as described. Didactics will be offered via Zoom.

**Course Objectives:** -Students will demonstrate ability to synthesize patient information, develop a differential diagnosis, determine the appropriate plan



- Students will demonstrate knowledge of important components of transitions of care and verbal and written communication skills necessary to address these components
- Students will demonstrate ability to evaluate a patients' social determinants of health and apply motivational interviewing techniques when justified
- Students will perform medication reconciliation and assess adherence with each patient assigned to them
- Students will demonstrate teamwork and ability to coordinate care with the in-person medical team

### EQUITABLE HEALTHCARE- A VIRTUAL CLINICAL ELECTIVE IN PEDIATRICS

**Course Type:** Other

**Department/Division:** Pediatrics

**Course Director:** Dr. Marquita Genies, [mgenies1@jhmi.edu](mailto:mgenies1@jhmi.edu), and Dr. Nicole Shilkofski, [nshilko1@jhmi.edu](mailto:nshilko1@jhmi.edu)

**Course Coordinator:** Carly Hyde, [chyde4@jhmi.edu](mailto:chyde4@jhmi.edu)

**Availability/Duration:** 2-week elective; Capacity- 6 learners; Next Course Offering to be determined.

**Prerequisite(s):** Completion of the Pediatrics core clerkship

**Drop Period:** N/A

#### ENROLLMENT LIMITED TO VISITING MEDICAL STUDENTS.

**Description:** This course is a 2-week virtual clinical experience for students to engage in clinical and learning opportunities in the field of Pediatrics. It is designed for students who have already completed a Pediatrics core clerkship and plan to apply into a Pediatrics residency. The course will consist of a shared, universal curriculum that will cover topics such as health disparities, global health, LGBTQIA+ health, telemedicine, palliative care, and community resources in Baltimore. The specialty-specific curriculum will explore equitable healthcare within Pediatrics through patient interviews, case presentations, departmental conferences, didactics, and team discussion, allowing students to refine their skills while networking with residents and faculty.

### TRAUMA-INFORMED CARE ELECTIVE

**Course Type:** Tutorial

**Department/Division:** Pediatrics, Pediatric Hospital Medicine Division

**Course Director:** Dr. Rachel Cane, [rcane2@jhmi.edu](mailto:rcane2@jhmi.edu)

**Faculty:** Dr. Rachel Cane

**Availability/Duration:** Course will be offered online during AY2020-2021, exact dates TBD. This course will be graded on a Pass/Fail scale.

**Prerequisite(s):** At least one clinical rotation

**Drop Period:** 1 month

#### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** Over the past several decades, a growing body of work has demonstrated that trauma and adverse childhood experiences are exceedingly common and are linked to a variety of negative health outcomes. At this time, there is no standardized curriculum to teach medical students the science of trauma and the appropriate delivery of trauma-informed care (TIC) to build resilience and mitigate the effects of trauma on physical and mental health.

This course intends to fulfill three objectives: (1) bring awareness to the impacts of trauma throughout the lifetime, (2) give students the confidence to compassionately discuss incidences of trauma with patients, (3) provide students with the tools to help build resilience and coping skills with patients. Composed of short lectures, role-playing activities, standardized patient experiences, self-reflection, discussion, and readings, this elective will be divided into seven sessions taken concurrently with a student's experience on the wards. This course will build on skills learned in Clinical Foundations of Medicine and clinical rotations to empower students to provide compassionate, evidence-based care for trauma-affected individuals during medical school and beyond.

**Course Objectives:** -Define trauma and Adverse Childhood Experiences (ACEs) and describe their impact on adult health

-Screen for history of trauma in patients of all ages.

-Understand and execute a thoughtful trauma-informed interview of a patient



- Conduct a trauma-sensitive physical exam
- Describe the symptoms of traumatic experiences in the pediatric population
- Describe strategies for the prevention and treatment of traumatic stress and cultivation of resilience
- Describe the impact of secondary traumatic stress on providers and discuss strategies for provider wellness and resilience

## RESEARCH OPPORTUNITIES

DR. HOOVER ADGER

Adolescent medicine (including sexually transmitted diseases, substance abuse, alcohol-drug prevention)

DR. MARILEE ALLEN

Assessment and follow-up of high-risk neonates and premature infants, focusing on developmental disabilities

DR. EMILY BARRON-CASELLA

Sickle cell disease

DR. HAROLYN BELCHER

Clinical outcome studies affiliated with Substance Abuse and Mental Health Services Administration- National Center of Traumatic Stress Network; child behavior checklist- National Child Traumatic Stress Network (CBCL NCTSN) Study; early head start intervention study

DR. GEORGE CAPONE

Down syndrome- clinical research opportunities; includes attendance at clinic and contribution to ongoing research projects

DR. BERNARD COHEN

Clinical investigations in pediatric dermatology

DR. PAUL COLOMBANI

Effect of cyclosporine on susceptible T lymphocytes early in immune response

DR. GARRY CUTTING

Identification of genetic and non-genetic modifiers of disease severity in the Mendelian disorder Cystic Fibrosis

DR. ANNE DUGGAN

Health services evaluation; home visiting programs for at-risk families; child abuse prevention; primary care

DR. JOHN GEARHART

Cellular function of bladder muscle

DR. ALEXANDER HOON, JR.

Movement disorders

DR. KWANG SIK KIM

Central nervous system infection and inflammation; pathogenesis; prevention and therapy

DR. REBECCA LANDA

Language and social abnormalities in autistic children and their siblings

DR. BETH LAUBE

In vivo quantification of the deposition and removal of particulates in healthy and diseased lungs using radiolabeled aerosols and scintigraphic lung-image assessments.

DR. HOWARD LEDERMAN

Immunodeficiency diseases (primary and acquired); ataxia-telangiectasia; hypogammaglobulinemia; immunology

DR. MAUREEN LEFTON-GREIF

Swallowing and respiratory coordination, with an emphasis on how these problems affect breathing; development of approaches to evaluate and treat children affected with oropharyngeal dysphagia

DR. PAUL LIPKIN

Attention deficit and learning disorders; developmental screening; autism spectrum disorders

DR. SHARON MCGRATH-MORROW

Growth factors in postnatal lung development

DR. ALICEA NEU

Clinical trials in pediatric renal transplantation, humoral immunity/vaccine response in pediatric renal patients (including chronic renal insufficiency, dialysis, and transplant patients)

DR. MARK RIDDLE

Pediatric psychopharmacology

DR. PETER ROWE

Clinical epidemiology and management of chronic fatigue syndrome

DR. JANET SERWINT

Health care issues of underserved children; medical education; end of life issues; practice-based research networks; medical home

DR. BRUCE SHAPIRO

Neurodevelopmental precursors of learning disability; attention deficit disorders

DR. HARVEY SINGER

Immune mechanisms in autism; pediatric movement disorders; motor stereotypy disorders- clinical and basic investigations; Tourette syndrome- treatment and pathophysiological studies; PANDAS (pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections)

DR. CLIFFORD TAKEMOTO

Myeloid development

DR. DAVID VALLE

Molecular biology of human genetic diseases, especially inborn errors of metabolism

## PHARMACOLOGY AND MOLECULAR SCIENCE

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ME:330.699

### ORGANIC MECHANISMS IN BIOLOGY

**Course Type:** Other  
**Department:** Pharmacology and Molecular Sciences  
**Course Director:** Drs. James Stivers and Caren Meyers  
**Telephone Number:** 410-502-2758  
**Faculty:** Drs. James Stivers and Caren Meyers and staff  
**Availability/Duration:** November - January  
**Prerequisite(s):** Organic chemistry  
**Drop Period:** 1 month

**Description:** This course deals with the chemical mechanisms of enzymes. It is intended to illustrate how catalysis in biological systems can be understood using principles derived from organic reaction mechanisms.

### GRADUATE PHARMACOLOGY 1

**Course Type:** Other  
**Department:** Pharmacology and Molecular Sciences  
**Course Director:** Dr. James Barrow  
**Telephone Number:** 410-955-0894  
**Faculty:** Dr. Barrow and staff  
**Availability/Duration:** August – November (12 weeks)  
**Drop Period:** 1 month

**Description:** This course is designed for second year graduate students. It covers basic pharmacology concepts and major drug classes related to disease therapies. The course covers basic principles of enzyme kinetics, receptors, pharmacokinetics, drug metabolism, and drug discovery.

### GRADUATE PHARMACOLOGY 2

**Course Type:** Other  
**Department:** Pharmacology and Molecular Sciences  
**Course Director:** Dr. James Barrow  
**Telephone Number:** 410-955-0894  
**Faculty:** Dr. Barrow and staff  
**Availability/Duration:** January- April (14 weeks)  
**Drop Period:** 1 month

**Description:** This course is designed for second year graduate students who have already taken Graduate Pharmacology 1. It covers basic pharmacology concepts and major drug classes related to disease therapies. The course includes lectures on therapeutic agents used in infectious diseases, cancer, cardiovascular diseases, endocrine disorders, inflammation, and nervous system diseases.

### ANALYTICAL METHODS OF CLINICAL PHARMACOLOGY

**Course Type:** Other  
**Department:** Pharmacology and Molecular Sciences  
**Course Director:** Dr. Craig Hendrix  
**Telephone Number:** 410-955-9707  
**Faculty:** Dr. Hendrix  
**Availability/Duration:** Summer; 3 weeks  
**Prerequisite(s):** Permission of instructor  
**Drop Period:** 1 month

**Description:** This course covers fundamental principles of, and necessary quantitative skills required in the analysis of clinical pharmacokinetic and pharmacodynamic data with a focus on analysis of data generated in early clinical studies in humans. Topics include principles of pharmacokinetic and pharmacodynamic data analysis, curve stripping, non-compartmental analysis, compartmental modeling, pharmacodynamic model selection, pharmacokinetic study design using simulation, and introduction to clinical trial simulation. Teaching format is lecture, demonstration, and in-class exercises with Excel and WinNonlin software. Problem sets are used to sharpen the individual skills of the student.

## RESEARCH OPPORTUNITIES

DR. RICHARD AMBINDER

Virology and human cancer; antitumor and antiviral therapy; lymphoma pathogenesis and treatment; immunological approaches to virus-associated malignancies

DR. L. MARIO AMZEL

3-D structure of proteins: immunoglobulins and other binding proteins; ATP synthase; monooxygenases and dioxygenases quinone reductases

DR. NETZ ARROYO

Exploiting biology-inspired electrochemical sensing to study the fate of molecules in the body

DR. JAMES BARROW

Drug discovery for disorders of neurodevelopment

DR. JAMES BERGER

Structural and catalytic mechanisms of nucleic-acid machines and assemblies; control of DNA replications and chromosome superstructure; small-molecule and biological regulatory mechanisms

DR. KRISTIN BIGOS

Using neuroimaging and genetics to develop better drugs for psychiatry

DR. NAMANDJE BUMPUS

Role of drug metabolism in non-nucleoside reverse transcriptase inhibitor-mediated toxicity

DR. GREGORY CARR

Preclinical models of neurological and psychiatric disorders

DR. TED DAWSON

Molecular and cellular signals controlling neurodegeneration, neuronal survival, and cell death

DR. SAMUEL DENMEADE

Targeted therapies for cancer; prodrugs; proteases; peptide libraries

DR. KELLY E. DOOLEY

Clinical pharmacology of anti-infective agents; evaluation of new drug regimens for the treatment of tuberculosis and co-treatment of TB and HIV

DR. LAURA ENSIGN

Nanomedicine for drug delivery

DR. CAREN FREEL MEYERS

Organic and medicinal chemistry; chemical biology; drug delivery mechanisms in bacteria; development of antibiotic prodrug strategies; study of bacterial isoprenoid biosynthesis; combinatorial biosynthesis; development of potential therapeutic agents

DR. MARC GREENBERG

Chemical and biochemical approaches to the study of DNA damage and repair, and their applications

DR. JUSTIN HANES

Nanotechnology for drug and nucleic acid delivery

DR. J. MARIE HARDWICK

Molecular mechanisms of programmed cell death

DR. LING HE

Regulations of glucose and lipid metabolism by co-activators and metformin

DR. CRAIG HENDRIX

Anti-infective drugs; chemoprevention of infectious disease

DR. RICHARD HUGANIR

Molecular mechanisms in regulation of synaptic plasticity

DR. TAKANARI INOUE

Synthetic Cell Biology: Total synthesis of cellular functions such as neutrophil chemotaxis and ciliary mechanosensation

DR. MATTHEW IPPOLITO

Chemotherapeutics for malaria control and elimination

DR. JOHN T. ISAACS

Anti-cancer drug development; Normal and malignant stem cell biology

DR. WILLIAM B. ISAACS

Understanding the molecular genetic events responsible for the initiation and progression of prostate cancer; inherited susceptibility of prostate cancer

DR. DAVID KASS

Molecular physiology of myocardial disease

DR. KENNETH KINZLER

Molecular genetics of cancer; translational cancer research

DR. MARK LEVIS

Targeting the FLT3 signaling pathway as a treatment for acute leukemia

DR. JUN LIU

Chemical biology and molecular biology; use of small molecules as probes to elucidate mechanisms of signal transduction; angiogenesis and cell proliferation

DR. WILLIAM NELSON

Molecular mechanisms of prostatic carcinogenesis; epigenetic alterations in cancer; new approaches to prostate cancer prevention and treatment

DR. SRIDHAR NIMMAGADDA

Chemokine receptor biology and molecular imaging applications in drug development

DR. KENNETH PIENTA

The ecology of cancer, tumor microenvironment, metastasis, biomarker development, novel therapeutic development

DR. MARTIN POMPER

In vivo molecular and cellular imaging; radiopharmaceutical development; targeted cancer imaging and therapy; functional brain imaging

DR. JONATHAN POWELL

Mechanisms of T-cell activation and tolerance

DR. STUART RAY

Computational immunovirology of chronic viral hepatitis

DR. DOUGLAS ROBINSON

Understanding cytokinesis and cell shape control

DR. CHRISTOPHER ROSS

Molecular mechanisms of apoptosis; roles of apoptosis in carcinogenesis and therapeutic resistance; novel therapeutic development in animal models of cancer

DR. RONALD SCHNAAR

Cell interactions in the nervous system

DR. THERESA SHAPIRO

Clinical pharmacology; molecular mechanisms of antiparasitic drug action; effects of topoisomerase inhibitors on DNA of trypanosomes; structure-activity of antimalarial trioxanes

DR. ROBERT SILICIANO

HIV latency, evolution, and persistence; HIV treatment and drug resistance; pharmacology of HIV drugs

DR. BARBARA SLUSHER

Directs Johns Hopkins Drug Discovery which represents the largest integrated drug discovery program on campus

DR. SOLOMON SNYDER

Molecular basis of neural signal transduction

DR. JAMES STIVERS

Structural and chemical biology of uracil metabolism and applications to cancer therapy; innate and adaptive immunity

DR. SARASWATI SUKUMAR

Molecular alterations in breast cancer

DR. SEAN TAVERNA

Histone and chromatin modifications; epigenetics and gene function; identification of histone building modules; small RNA directed gene slicing

DR. CRAIG A. TOWNSEND

Organic and bioorganic chemistry: biosynthesis of natural products and biomimetic synthesis: protein isolation and mechanistic enzymology; molecular biology of secondary metabolism and the applications of biosynthetic systems; study of the role and inhibition of fatty acid synthesis in human cancer and tuberculosis

DR. BERT VOGELSTEIN

Molecular genetics of human cancer

DR. HUIJUN WEI

Identifying and validating drug targets for the treatment of neurodevelopmental disorders

DR. ETHEL WELD

Alternative delivery strategies for HIV prevention and treatment and expanding treatment options for special populations with TB and HIV

DR. MICHAEL J. WOLFGANG

Cellular and organismal metabolism

DR. SRINIVASAN YEGNASUBRAMANIAN

Understanding and exploiting alterations in the cancer genome and epigenome for development of biomarkers and therapeutics

DR. HENG ZHU

Signal transduction, protein network, host-pathogen interaction, biomarker identification

## PHYSICAL MEDICINE AND REHABILITATION

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ME:716.699

### PHYSICAL MEDICINE AND REHABILITATION

**Course Type:** Clinical Clerkship

**Department/Division:** Department of Physical Medicine and Rehabilitation

**Course Director:** Dr. Tracy Friedlander

**Telephone Number:** 410-502-2446

**Faculty:** Dr. Friedlander and staff

**Availability/Duration:** All year; ½ or full quarter; maximum four students

**Prerequisite(s):** At least a second-year student beginning the fourth quarter

**Drop Period:** 1 month

**Description:** This elective is intended for students considering a career in physical medicine and rehabilitation. Students will care for inpatients on the Good Samaritan Hospital (stroke or spinal cord) or Johns Hopkins Hospital (complex medical) inpatient rehabilitation units. They will also care for outpatients in musculoskeletal medicine, electrodiagnosis, spasticity, prosthetics, and pain clinics. There is flexibility in selecting subspecialty interests. Objectives of the course are to increase knowledge and proficiency in the following areas: basic clinical skills, such as history taking, physical examination, and general knowledge pertaining to inpatient care; diagnosis, pathophysiology and treatment of certain conditions in which severe physical disability is a prominent feature; the contributions of non-physician health professions required for the comprehensive care of certain patients; the importance of patient and family education in reducing the cost of disability and preventing recurrent hospitalization for health crisis.

### ADVANCED CLINICAL CLERKSHIP IN PEDIATRIC REHABILITATION

**Course Type:** Clinical Clerkship

**Department/Division:** Department of Physical Medicine & Rehabilitation

**Course Director:** Dr. Frank S. Pidcock

**Contact:** Ms. Dianna Augustyniak, [daugust2@jhmi.edu](mailto:daugust2@jhmi.edu)

**Telephone Number:** 443-923-9187

**Faculty:** Drs. Frank Pidcock and staff

**Availability/Duration:** All year; ½ quarter; one student

**Prerequisite(s):** Core Clerkship in Pediatrics recommended

**Drop Period:** 1 month

**Description:** Students will focus on care of children with disabilities at the Kennedy Krieger Institute

### CHRONIC DISEASE AND DISABILITY: IMPROVING QUALITY OF LIFE

**Course Type:** Clinical Clerkship

**Department/Division:** Department of Physical Medicine and Rehabilitation and Division of Geriatric Medicine

**Course Director:** Dr. Samuel Mayer

**Telephone Number:** Carolyn Robinson 410-550-7162, [crobin44@jhmi.edu](mailto:crobin44@jhmi.edu)

**Faculty:** Drs. S. Mayer, T. Finucane, and staff

**Availability/Duration:** Available all year for ½ quarter

**Prerequisite:** Medicine Core Clerkship for site placement at JHBMC. No clerkships required for JHH or KKI.

**Drop Period:** 1 month; contact Registrar's Office

**Description:** Over 100 million Americans suffer from one or more chronic diseases; over 35 million have severe disability as a result. These will be your patients in the future, irrespective of what specialty you ultimately choose. The goal of this rotation is that all students should possess the knowledge, skills, and attitudes to provide care for persons with chronic diseases and disabilities. The clerkship will focus on issues of chronic disease and disability in a variety of clinical settings, and will have concurrent didactic work, discussion groups, and simulation experiences on an inpatient rehabilitation unit, visits to a sub-acute or chronic care facility, outpatient clinics which emphasize care of disabled and chronically ill patients, and home visits. Inpatient acute care will be de-



emphasized. Students will participate in interdisciplinary team meetings and patient/family conferences. Clinical sites will include Johns Hopkins Hospital (general adult rehabilitation), Johns Hopkins Bayview (geriatrics), and Kennedy Krieger (pediatric disabilities). There will be home visits, discussion groups, and simulation exercises. There are no overnight call duties.

### PHYSICAL MEDICINE AND REHABILITATION VIRTUAL ELECTIVE

**Course Type:** Other

**Department/Division:** Physical Medicine and Rehabilitation

**Course Director:** Dr. Tracy Friedlander, tfried1@jhmi.edu

**Faculty:** Dr. Tracy Friedlander, Dr. Sam Meyer, Dr. April Pruski, Dr. Mary Keszler, and Dr. Marlis Gonzalez-Fernandez

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

**Description:** This elective will offer a broad exposure to the scope of physical medicine and rehabilitation. In addition to learning about medical management of patients with disability, student will get exposure the Johns Hopkins residency program, faculty, and clinical and research opportunities in the department of PM&R. Students will have the opportunity to give presentation and share their passion for PM&R.

**Course Objectives:** -Recognize the scope of practice of Physical Medicine and Rehabilitation physicians and the interdisciplinary team

-Identify common medical conditions affecting people with disabilities and the role of Physiatrists in improving the quality of life and function for people with disabilities

-Participate in discussions with peers and faculty about the role of PM&R in care of people with disabilities-Devise a presentation to demonstrate comfort discussing medical and social issues that affect persons with disability

-Write a reflection about the impact of disability on medical care and personal understanding of PM&R

### ADVANCED CLERKSHIP IN REHABILITATION RESEARCH

**Course Type:** Research

**Department/Division:** Department of Physical Medicine and Rehabilitation

**Course Director:** Physical Medicine & Rehabilitation Staff

**Telephone Number:** 410-502-2446

**Faculty:** PM&R faculty

**Availability/Duration:** Offered all year; ½ quarter or 3 weeks; maximum three students

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** This research elective involves establishing a relationship with a research mentor and working on one of their projects. Topics include:

DR. P. CELNIK  
Neuroplasticity, transcranial magnetic stimulation

DR. M. GONZALEZ-FERNANDEZ

Stoke and dysphagia, prosthetics

DR. M. BRODSKY

Physiology of mastication and swallowing; functional anatomy of the upper aerodigestive tract; evaluation and treatment of swallowing disorders, dysphagia in ICU

DR. F. PIDCOCK

Effects of botulism toxin injections on children with spasticity; effects of constraint induced therapy and quantitative measurement of spasticity

DRS. A. RECIO and C. SADOWSY Recovery and regeneration in spinal cord injury

DR. S. WEGENER

Chronic pain related to injury, chronic disease, or disability; cognitive-behavioral and self-management interventions; positive psychological variables (denial, positive coping, hope and spirituality) in health outcomes

## PHYSIOLOGY

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ME:360.699

### RESEARCH OPPORTUNITIES

#### Primary Faculty

DR. STEVEN CLAYPOOL

Mitochondrial phospholipid metabolism in health and disease.

DR. DAX FU

Zinc transporters: biochemistry, biophysics, and cell biology.

DR. WILLIAM GUGGINO

Genetic diseases resulting in defective ion channels.

DR. ANASTASIA KRALLI

Regulatory pathways that control adaptive metabolic responses in adipose and skeletal muscle tissues.

DR. SVETLANA LUTSENKO

Human copper homeostasis: biochemical mechanisms of transport and compartmentalization of metal ions, the role of copper in lipid metabolism and cell differentiation, developing new approaches for treatment of human disorders of copper misbalance.

DR. JENNIFER PLUZNICK

Renal physiology; the role of sensory receptors in regulating renal function; localizing renal olfactory receptors and identifying their ligands in order to understand the role of each receptor in whole-animal physiology.

DR. ZHAOZHU QIU

Mechanisms of osmotic regulation in physiology and disease.

DR. RAJINI RAO

Ion transporters in human health and disease. Calcium signaling in lactation and breast cancer. New roles for endosomal Na<sup>+</sup>/H<sup>+</sup> exchangers in pH regulation, trafficking, and sodium homeostasis and their contributions to hypertension, autism, and glioblastoma.

DR. ROGER REEVES

Down syndrome, animal models to clinical trials.

DR. GUANG WONG

Metabolic physiology of secreted hormones.

DR. THOMAS WOOLF

Molecular dynamics simulations of large conformational changes involved with function; Biophysics of membrane proteins; signaling networks, drug design, and allostery; Relative free energy calculations, estimates of entropy: enthalpy compensation, and insights into structure: function connections.

#### Secondary Faculty

DR. MARK ANDERSON

Cardiac arrhythmia; CaM kinase II; the role of enzyme CaMKII (ca<sup>2+</sup>/calmodulin dependent kinase II) in heart failure and cardiac arrhythmias, a cause of sudden cardiac death.

DR. VALINA DAWSON

Molecular mechanisms of neuronal death and survival; cell death and cell survival signaling pathways in models of stroke and Parkinson's disease.

DR. MARK DONOWITZ

Molecular physiology of intestinal NA absorption and its regulation.

DR. DANIEL RABEN

Structure, function, regulation, and interfacial enzymology of lipid metabolizing enzymes involved in signal transduction cascades; biochemistry and chemistry of lipids and lipid metabolizing enzymes involved in signaling cascades.

DR. SHUYING SUN

RNA metabolism dysfunction and RNA-targeting therapeutics in neurodegeneration.

## PREVENTIVE MEDICINE

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ME:714.699

### PREVENTIVE MEDICINE

**Course Type:** Other

**Department:** General Preventive Medicine Residency, Bloomberg School of Public Health

**Course Director:** Dr. Clarence Lam

**Telephone Number:** 410-955-3362; SPH Room WB602

**Faculty:** General Preventive Medicine Chief Resident

**Contact:** Dottie Becraft, [dbecraft@jhu.edu](mailto:dbecraft@jhu.edu)

**Availability/Duration:** Fall and Spring dates are decided every June/July and posted on the GPMR website.

**Prerequisite(s):** Successful completion of junior medical student training.

**Drop Period:** 1 month

**Description:** This elective introduces students to the specialty of medicine devoted to health promotion and disease prevention as well as public health. Students will learn the theory and practice of the principles required in population-based health. Didactic sessions and self-learning modules will be available on such topics as health promotion, injury control, healthcare delivery, public health surveillance, and outbreak investigation.

During the rotation, students will have the opportunity to interact with program residents and visit many sites in the Baltimore-Washington area where residents rotate during the second year of the program. These sites will include, local, state, federal public health agencies, as well as NGO's and "for profit" health care organizations.

Students will interact on a daily basis with the chief resident of the General Preventive Medicine Residency. They will also meet with Dr. Lam, the training program director. A project and presentation are required.

### OCCUPATIONAL AND ENVIRONMENTAL MEDICINE

**Course Type:** Clinical Clerkship

**Department:** Bloomberg School of Public Health

**Course Director:** Dr. Aisha Rivera and Dr. Brian Schwartz

**Contact:** Dr. Aisha Rivera, [ariver28@jhu.edu](mailto:ariver28@jhu.edu)

**Faculty:** Dr. Aisha Rivera and Dr. Brian Schwartz

**Availability/Duration:** Must be arranged and approved on a case-by-case basis

**Prerequisite(s):** Internal Medicine Rotation

**Drop Period:** 1 month

**Description:** Learn about the specialty of occupational medicine and treat patients in an occupational setting. Work with an interdisciplinary team including safety and ergonomic professionals, physicians, and nurse case managers. Understand type of work injuries, prevention strategies and other types of visits common to occupational medicine, including pre-employment physicals, surveillance physicals and fit for duty physicals.

### OCCUPATIONAL AND ENVIRONMENTAL RESEARCH

**Course Type:** Basic Research

**Department:** Bloomberg School of Public Health

**Course Director:** Dr. Brian Schwartz

**Contact:** Dr. Brian Schwartz; [bschwar1@jhu.edu](mailto:bschwar1@jhu.edu)

**Faculty:** Dr. Brian Schwartz

**Availability/Duration:** Must be arranged and approved on a case-by-case basis

**Prerequisite(s):** Prior research experience preferred

**Drop Period:** 1 month

**Description:** Learn about the specialty of occupational medicine. Engage in a research project related to occupational and environmental medicine.



## PSYCHIATRY AND BEHAVIORAL SCIENCES

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ME:370.699

### NEUROPSYCHIATRY RESEARCH

**Course Type:** Clinical Research (Parkinson's disease)  
**Department/Division:** Psychiatry and Behavioral Sciences  
**Course Director:** Dr. Greg Pontone  
**Telephone Number:** 410-502-0477  
**Faculty:** Dr. Pontone and departmental faculty  
**Availability/Duration:** See course director; ½ quarter  
**Prerequisite(s):** Core Clerkship in Medicine and Psychiatry  
**Drop Period:** 1 month

**Description:** Students are exposed to the various ongoing neuropsychiatry research projects of the department. These include studies in neuroimaging, epidemiology, nursing home research, clinical trials, and outcome studies. Students may choose and develop one project of their own to complete during the rotation.

### RESEARCH IN EATING DISORDERS

**Course Type:** Basic Research  
**Department/Division:** Psychiatry and Behavioral Sciences  
**Course Director:** Dr. Angela Guarda  
**Telephone Number:** 410-955-3863  
**Faculty:** Drs. Guarda and Redgrave  
**Availability/Duration:** Minimum of 6 weeks or half day/week for a whole semester  
**Drop Period:** 1 month

**Description:** Opportunity for clinical research on eating disorders, primarily anorexia nervosa and bulimia nervosa. Experience may involve interviewing or outcome studies, chart reviews and work with patients.

### CLINICAL RESEARCH ON THE BEHAVIORAL PHARMACOLOGY OF DRUG ABUSE AND DEPENDENCE

**Course Type:** Clinical Research  
**Department/Division:** Psychiatry and Behavioral Sciences  
**Course Director:** Dr. George Bigelow  
**Telephone Number:** 410-550-0035  
**Faculty:** Drs. Bigelow, R. Griffiths, and M. Stitzer  
**Availability/Duration:** All year; 4½ to 9 weeks or 3 weeks  
**Drop Period:** 1 month

**Description:** Research experience in human laboratory or treatment clinic concerning human drug abuse and the subjective and behavioral effects of abused drugs, including opioids, cocaine, sedatives, ethanol, tobacco, caffeine, marijuana, hallucinogens, and of medications that modify their effects or use.

### MOLECULAR NEUROBIOLOGY AND NEUROPSYCHIATRIC DISORDERS

**Course Type:** Basic Research  
**Department/Division:** Psychiatry and Behavioral Sciences  
**Course Director:** Dr. Russell Margolis  
**Telephone Number:** 410-614-4262  
**Faculty:** Dr. Margolis and Dr. Li  
**Availability/Duration:** All year; 9 weeks  
**Drop Period:** One month

**Description:** A variety of efforts are underway in the Laboratory of Genetic Neurobiology to find and study genetic causes of neurological disorders, particularly those involving abnormal movements and neurodegeneration. A

major theme of the lab is the role of unstable DNA in human disease. Current projects focus on the role of RNA in neurotoxicity, the impact of bidirectional transcription at disease loci, and a novel approach to discovery of small molecules with the potential of treating Huntington's disease. Students will have the opportunity to apply molecular and biochemical methods to cell and animal models and to participate in the drug discovery process.

### GERIATRIC PSYCHIATRY/NEUROPSYCHIATRY

**Course Type:** Clinical Elective

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Susan Lehmann

**Telephone Number:** Ms. Shanetha Thomas 443-287-4506 or [sthom175@jhmi.edu](mailto:sthom175@jhmi.edu)

**Faculty:** Dr. Susan Lehmann

**Availability/Duration:** Summer Sessions 1, 2, 3

**Prerequisite(s):** Core Clerkship in Psychiatry preferred but not required

**Drop Period:** 2 months

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Students will have the opportunity to evaluate and follow patients on inpatient and outpatient services of the Division of Geriatric Psychiatry and Neuropsychiatry. They will be exposed to patients with a broad range of cognitive, affective, and behavioral disturbances in context with a variety of psychiatric conditions, including patients with psychiatric disorders related to stroke, Parkinson's disease, and dementia, as well as mood disorders and psychotic disorders. Weekly readings help students understand key issues in geriatric psychiatry and the heterogeneity of normal aging.

### ASSESSMENT AND TREATMENT OF SEXUAL DISORDERS

**Course Type:** Clinical Clerkship

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Fred Berlin

**Telephone Number:** 410-539-1661

**Faculty:** Dr. Berlin

**Availability/Duration:** Flexible; also offered for 3 weeks

**Prerequisite(s):** An interest in clinical psychiatry

**Drop Period:** 1 month

**Description:** Students will attend a weekly assessment clinic as well as a weekly teaching session and can follow the progress of patients in treatment. Many of the patients have sexual disorders such as pedophilia and exhibitionism and may receive weekly injections of antiandrogenic medication.

### SUBINTERNSHIP IN PSYCHIATRY

**Course Type:** Subinternship

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Drs. Vinay Parekh and Avi Gerstenblith

**Telephone Number:** Ms. Shanetha Thomas 443-287-4506 or [sthom175@jhmi.edu](mailto:sthom175@jhmi.edu)

**Faculty:** Psychiatry faculty members

**Availability/Duration:** All year; any length 4 weeks or greater

**Prerequisite(s):** Core Clerkship in Psychiatry; Core Clerkship in Medicine recommended

**Drop Period:** 2 months

**Description:** Sub-internship on any of the Meyer Psychiatry Units: mood disorders, eating disorders, motivated behavior disorders, geriatric, chronic pain, and schizophrenia service. Students will have the opportunity to function in the capacity of a resident, taking primary responsibilities in the evaluation and treatment of patients on an inpatient service under the supervision of the attending psychiatrist. Sub-interns will work directly with patients, meet with family members, and coordinate care with consultants, other care providers and the team social worker. In addition, sub-interns will play an active role in teaching rounds, perform literature reviews of



topics relevant to their patients, and work extensively with the non-physician members of the multi-disciplinary treatment team.

### HIV PSYCHIATRY SERVICE

**Course Type:** Subinternship/Research  
**Department/Division:** Psychiatry and Behavioral Sciences  
**Course Director:** Dr. Glenn Treisman  
**Telephone Number:** 410-955-6328  
**Faculty:** Dr. G. Treisman  
**Availability/Duration:** All year; ½ or full quarter  
**Prerequisite(s):** None  
**Drop Period:** 1 month

**Description:** Outpatient clinic, inpatient consults, and evaluation clinic for HIV infected patients with psychiatric disorders. Clinical research with HIV-infected patients may also be arranged.

### FORENSIC PSYCHIATRY

**Course Type:** Other  
**Department/Division:** Psychiatry and Behavioral Sciences  
**Course Director:** Dr. Jeffrey Janofsky  
**Telephone Number:** 410-955-2236  
**Faculty:** Dr. Janofsky  
**Availability/Duration:** All months except July and August; ½ quarter  
**Prerequisite(s):** Complete general psychiatry rotation  
**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The course consists of experience at the Medical Service of the Circuit Court for Baltimore City. Experience in criminal forensic psychiatry will involve examination of offenders for competency, criminal responsibility and sentencing recommendations. Visits to courtrooms are included along with readings and discussions. Not available for visiting students. Johns Hopkins students who apply need to have completed psychiatry general clerkship.

### CHILD AND ADOLESCENT PSYCHIATRY

(Also listed under Pediatrics)

**Course Type:** Clinical Clerkship  
**Department/Division:** Psychiatry and Behavioral Sciences/ Division of Child & Adolescent Psychiatry  
**Course Director:** Dr. Esther Lee, [elee121@jhmi.edu](mailto:elee121@jhmi.edu)  
**Telephone Number:** 410-955-7858; Josh Elliott; [jellio26@jhmi.edu](mailto:jellio26@jhmi.edu)  
**Faculty:** **Students** will work with division faculty as they rotate through clinical service  
**Availability/Duration:** 2, 3, 4 or more weeks.  
**Prerequisite(s):** Completion of pediatrics or adult psychiatry rotation is recommended but not necessary  
**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** **Students** will work with child psychiatry fellows and division faculty across various clinical services at the Johns Hopkins Hospital, Kennedy Krieger Institute and Bayview Medical Center. These services include the inpatient unit, day hospital program and general and specialty outpatient clinics. Students will gain exposure to childhood psychiatric disorders, family and educational systems and community systems of care.

## VIRTUAL GERIATRIC MENTAL HEALTHCARE IN THE COMMUNITY

**Course Type:** Other

**Department/Division:** Psychiatry, Division of Geriatric Psychiatry and Neuropsychiatry

**Course Director:** Dr. Deirdre Johnston, [djohnst4@jhmi.edu](mailto:djohnst4@jhmi.edu)

**Faculty:** Dr. Deirdre Johnston and Dr. Jin Joo

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course aims to familiarize students with mental health needs of elderly persons living in the community, two models of community-based geriatric mental healthcare, and the use of available communication technologies to support these patients' care during the COVID19 pandemic. It will give students an opportunity to observe interactions with patients served by geriatric mental healthcare outreach teams now using audio and realtime audiovisual communication to replace in-person visits. In addition, students will participate in weekly multi-site interdisciplinary telementoring sessions of teams providing community-based care and support to persons with dementia and their caregivers.

**Course Objectives:** -Describe common mental health conditions among community-dwelling elderly

-Discuss common barriers to continuity of care in this population

-Illustrate the use of telecollaborative case-based mentoring of community-based dementia care teams

-Develop community-based strategies to support a person with dementia living in the community

## RESEARCH IN NEUROPSYCHIATRIC DISORDERS

**Course Type:** Basic and Clinical Research

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Christopher Ross

**Telephone Number:** 410-614-0011

**Faculty:** Dr. Ross

**Availability/Duration:** Year-round, 4½ weeks or 9 weeks

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** The Baltimore Huntington's Disease Center (BHDC) follows a large number of patients with HD on a longitudinal basis and conducts multidisciplinary research into the clinical features, genetic aspects, and neurobiology of HD. Students will have the opportunity to participate in clinical research projects, neuroimaging studies, neuropathological studies, or correlation of the causative mutation (the expanding triplet repeat) with clinical features. We pioneered the study of individuals ("pre-symptomatic") with the HD gene mutation who don't have clinical features of the disease in order to determine when and where brain changes begin in order to design preventive interventions. In parallel basic science investigations, we are studying cell and mode models of HD and other brain diseases. In collaborative studies, we also are studying brain imaging and clinical features of schizophrenia. Other topics of interest can be arranged individually. The goal is to develop novel therapeutic interventions for brain diseases.

## RESEARCH IN MOLECULAR NEUROBIOLOGY

**Course Type:** Basic and Clinical Research

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Christopher Ross

**Telephone Number:** 410-614-0011

**Faculty:** Dr. Ross

**Availability/Duration:** Year-round, 4½ weeks or 9 weeks

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** The laboratory studies genes expressed in the brain as a means of better understanding normal brain function and neuropsychiatric disorders. We study the neurodegenerative diseases Huntington's disease and Parkinson's disease by focusing on the relevant gene products such as Huntington, Alpha-synuclein, and LRRK2, and their interactions. We use biochemical methods, cell culture approaches, and generation of transgenic mouse models in order to better understand the disease and to develop targets for experimental therapeutics. We are also studying the role of candidate genes in schizophrenia. We have developed mouse models and human IPS models of several diseases. We have a new mouse model of bipolar disorders. Clinical studies are done in collaboration with clinical investigators in the Department of Psychiatry. Students can learn the basics of molecular cloning techniques and cell culture and mouse model approaches while studying clinically relevant genes expressed in brain and can participate in the development of experimental therapeutics.

#### NEUROPSYCHIATRY

**Course Type:** Advanced Elective

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Greg Pontone

**Telephone Number:** 410-550-0477

**Faculty:** Dr. Pontone and departmental faculty.

**Availability/Duration:** All year; ½ quarter

**Prerequisite(s):** Core Clerkship in Psychiatry, 4th year student

**Drop Period:** 1 month

**Description:** The advanced elective in neuropsychiatry rotates the senior or advanced medical student through the several inpatient, outpatient, and nursing home teaching components of the neuropsychiatry service. The focus is clinical, intended to develop expertise in evaluation, differential diagnosis, workup, and treatment. Patients with the most common neuropsychiatric disorders are seen, including dementia, Alzheimer's, Parkinson's, Huntington's, stroke, MS, PSP, traumatic brain injury, AIDS, and others.

#### CLINICAL RESEARCH IN SCHIZOPHRENIA

**Course Type:** Clinical Research

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Russell Margolis

**Telephone Number:** 410-614-4262

**Faculty:** Drs. Margolis

**Availability/Duration:** 3 weeks, 4 ½ weeks

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** Schizophrenia is a devastating disorder of the brain characterized by hallucinations, delusions, and disordered thought, affecting 0.5-1% of the world population. Recent developments in epidemiology, phenotypic analysis, neuroimaging, molecular genetics, and neuropathology have, for the first time, provided the tools for understanding the pathobiology of schizophrenia and developing rational therapeutics. Students will have the opportunity to gain experience with one or more of these approaches as applied to schizophrenia. Elective activities will focus on participation in the design and implementation of research projects and direct contact with patients and control populations. Students will also engage in a critical review of the relevant literature and attend schizophrenia teaching rounds and outpatient clinics focusing on recent onset schizophrenia.

#### ECT & NOVEL BRAIN STIMULATING THERAPIES

**Course Type:** Research

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Irving Reti

**Telephone Number:** 410-955-1484

**Faculty:** Dr. Reti

**Availability/Duration:** 4½ or 9 weeks

**Prerequisite(s):** If interested in bench work, ideally, students should have some experience working with rodents.

**Drop Period:** 1 month

**Description:** Electroconvulsive therapy (ECT) is the most effective available therapy for treating depression, however little is known about its mechanism of action. Mice genetically engineered to lack key genes which are inducible by electroconvulsive stimulation, and which regulate synaptic plasticity may yield clues to how it works. Although ECT is highly effective, it is not without side-effects and so there has been keen interest in developing alternate forms of therapeutic brain stimulation for depression, such as repetitive transcranial magnetic stimulation (TMS) and deep brain stimulation (DBS), that are more focal and do not involve anesthesia. We are now offering TMS as a clinical service to treat depression and also clinical trials using the technique.

Repetitive self-injurious behaviors are seen in developmental disorders, and in autism as many as a third to one-half display these behaviors such as head-banging, biting, and punching themselves. Many respond to pharmacological and behavioral treatments. In those who are unresponsive, ECT has been dramatically effective, reducing episodes by 90+ percent. Typically, these patients require maintenance ECT, as frequently as once every five days. This situation raises concern because ECT is associated with cognitive side-effects and the long-term consequences of such frequent ECT begun at a young age are unknown. As an alternative, we are exploring the potential of DBS to suppress self-injurious behaviors in autism that are not associated with cognitive and other side effects. We are presently using rodents for this research. The student will have the opportunity to focus on bench work that may yield clues to ECT's mechanism of action and/or to assist in the development of alternate brain stimulation treatment modalities for repetitive self-injurious behavior. Alternatively, the student may focus on clinical work related to ECT and novel brain stimulation techniques. If students opt to rotate through the lab, ideally, they should have some experience working with rodents.

#### HUMAN BEHAVIORAL PHARMACOLOGY OF NOVEL SEDATIVES AND HALLUCINOGENS

**Course Type:** Research

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Roland Griffiths

**Telephone Number:** 410-550-0034

**Faculty:** Dr. Griffiths

**Availability/Duration:** Flexible

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** Opportunity to participate in ongoing human research characterizing behavioral, cognitive, subjective, and physiological effects of novel sedative compounds and hallucinogens. Compounds of interest include GHB, ketamine, dextromethorphan, psilocybin, and the classical benzodiazepines. Compounds of interest include psilocybin, ketamine, dextromethorphan, Salvia divinorum, DMT (N, N-dimethyltryptamine, and classic sedative hypnotics.)

#### COMMUNITY PSYCHIATRY

**Course Type:** Other

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Bernadette Cullen

**Telephone Number:** 410-955-5748

**Faculty:** Dr. Cullen

**Availability/Duration:** Flexible; 3-4 weeks

**Prerequisite(s):** Must be comfortable traveling with staff in the East Baltimore area.

**Drop Period:** 1 month

**Description:** An opportunity to work with clinicians who are treating patients with chronic mental illness in a variety of out-patient settings. Students rotate through the general out-patient clinic (OMHC), the intensive out-patient program (IOP) and the assertive community treatment (ACT) program. Within the ACT program patients are seen both at the hospital and their homes.

## TRAUMA: SEQUELAE AND THERAPEUTIC APPROACHES

**Course Type:** Other

**Department/Division:** Psychiatry

**Course Director:** Dr. Sylvia Atdjian, [satdija1@jh.edu](mailto:satdija1@jh.edu)

**Faculty:** Dr. Sylvia Atdjian and Dr. Carol Vidal

**Availability/Duration:** 1 week elective; 4/19/21-4/23/21 and 5/24/21-5/28/21

**Prerequisite(s):** N/A

**Drop Period:** 1 month

**Description:** This course will explore the phenomenology, neurobiological substrates, and sequelae of trauma. Students will learn of the relation of childhood trauma to the leading causes of morbidity and mortality in adults; about assessment and intervention in domestic violence and community violence; and about the spectrum of trauma-related disorders. Students will also learn about trauma informed approaches to “first do no harm” and about trauma-specific therapeutic approaches.

**Course Objectives:** -Describe the varied symptomatic, syndromic, and behavioral adaptations to trauma and factors that lead to resilience

-Learn the fundamentals of assessment, triage, and intervention in domestic and community violence

-Practice trauma-informed approaches in any clinical setting

## EATING DISORDERS: AN INTRODUCTION TO CARE AND TREATMENT

**Course Type:** Other

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Jennifer Goetz, [jgoetz@jhmi.edu](mailto:jgoetz@jhmi.edu)

**Faculty:** Dr. Jennifer Goetz

**Availability/Duration:** 1 week elective; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course will introduce students to the epidemiology, clinical presentation, clinical work-up, diagnosis, and treatment approach to patients with various eating disorders including anorexia and bulimia nervosa and binge eating disorders. The course will integrate both psychiatric and medical knowledge and complement clinical and didactic experiences across both fields.

The course will include a combination of both didactic presentations, case-based assessment, and individual study time. There will be several readings to introduce you to the biological, psychological, social, epidemiological, and medical aspects of eating disorders. There will be a case-based assignment to work through which will be used as an assessment tool for grading (pass/fail) in the course. The case will be worked through together as a class (via teleconference) once it has been completed individually by each student. Participation in this part of the course will be a part of the grading process. There will also be a short quiz at the end of the course which will require at least a 70% to pass.

**Course Objectives:** -Describe the signs and symptoms of anorexia nervosa, bulimia nervosa and binge eating disorder

- Identify common medical complications of anorexia nervosa, bulimia nervosa and binge eating disorder as well as recommended monitoring and treatment
- Identify psychiatric comorbidities associated with anorexia and bulimia nervosa and binge eating disorder
- Facilitate understanding of the refeeding syndrome and identify strategies to decrease its occurrence in the treatment of anorexia nervosa and malnourished states associated with other eating disorders
- Identify appropriate therapeutic interventions for each of the eating disorders
- Formulate a treatment plan for patients presenting with anorexia or bulimia nervosa in an outpatient general medical practice

### VIRTUAL GERIATRIC MENTAL HEALTHCARE IN THE COMMUNITY

**Course Type:** Other

**Department/Division:** Psychiatry, Division of Geriatric Psychiatry and Neuropsychiatry

**Course Director:** Dr. Deirdre Johnston, [djohnst4@jhmi.edu](mailto:djohnst4@jhmi.edu)

**Faculty:** Dr. Deirdre Johnston and Dr. Jin Joo

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** Completion of Year 1

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course aims to familiarize students with mental health needs of elderly persons living in the community, two models of community-based geriatric mental healthcare, and the use of available communication technologies to support these patients' care during the COVID19 pandemic. It will give students an opportunity to observe interactions with patients served by geriatric mental healthcare outreach teams now using audio and realtime audiovisual communication to replace in-person visits. In addition, students will participate in weekly multi-site interdisciplinary telementoring sessions of teams providing community-based care and support to persons with dementia and their caregivers.

- Course Objectives:**
- Describe common mental health conditions among community-dwelling elderly
  - Discuss common barriers to continuity of care in this population
  - Illustrate the use of telecollaborative case-based mentoring of community-based dementia care teams
  - Develop community-based strategies to support a person with dementia living in the community

### EQUITABLE HEALTHCARE- A VIRTUAL CLINICAL ELECTIVE IN PSYCHIATRY AND BEHAVIORAL SCIENCES

**Course Type:** Other

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Vinay Parekh, [vparekh1@jhmi.edu](mailto:vparekh1@jhmi.edu), Dr. Ted Avi Gerstenblith, [tgerste1@jhmi.edu](mailto:tgerste1@jhmi.edu), and Dr. Anne E. Ruble, [aruble@jhmi.edu](mailto:aruble@jhmi.edu)

**Course Coordinator:** Ms. Shanetha Thomas 443-287-4506 or [sthom175@jhmi.edu](mailto:sthom175@jhmi.edu)

**Availability/Duration:** 2-week elective; Capacity- 8 learners; Next Course Offering to be determined.

**Prerequisite(s):** Completion of the Psychiatry core clerkship

**Drop Period:** N/A

#### **ENROLLMENT LIMITED TO VISITING MEDICAL STUDENTS.**

**Description:** This course is a 2-week virtual clinical experience for students to engage in clinical and learning opportunities in the field of Psychiatry and Behavioral Sciences. It is designed for students who have already completed a Psychiatry core clerkship and plan to apply into a Psychiatry residency. The course will consist of a shared, universal curriculum that will cover topics such as health disparities, global health, LGBTQIA+ health, telemedicine, palliative care, and community resources in Baltimore. The specialty-specific curriculum will explore equitable healthcare within Psychiatry and Behavioral Sciences through patient interviews, case presentations, departmental conferences, didactics, and team discussion, allowing students to refine their skills while networking with residents and faculty.

## PROFESSIONAL IDENTITY (TRANS)FORMATION: AN ART MUSEUM-BASED ELECTIVE

**Course Type:** Other

**Department/Division:** Psychiatry and Behavioral Sciences and Medicine

**Course Director:** Dr. Margaret Chisolm, [mchisol1@jhmi.edu](mailto:mchisol1@jhmi.edu)

**Faculty:** Heather Kagan MD and Bonnie Marr MD, with guest facilitation by Kaitlin Stouffer MSc, Mark Stephens MD, Paul Haidet MD, as well as museum educators Philip Yenawine, Elizabeth Benskin, and Suzy Wolffe

**Availability/Duration:** This course is available to any 3rd or 4th year JHUSOM student. Enrollment is limited to 15 students, and the course will be offered if at least 5 students enroll and if in-person teaching is permitted by JHU and the Baltimore Museum of Art, as anticipated. Course is offered second half of block VI (Feb 22- March 12, 2021).

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** This highly interactive 3-week arts and humanities course will take place primarily at the Baltimore Museum of Art and other local museums, although we will engage in a few arts-based experiences in clinical settings and online. This course is about professional identity (trans)formation, and builds on what you have learned in Years 1-4 of the College Advisory Program TIME Small Group Teaching Sessions about your sense of self and professional identity, and complements what you may have experienced in the 1-week elective, "Online Art Museum Exploring Professional Identity through Art." Priority enrollment will be given to Year 4 students as what you learn here is designed to prepare you to thrive personally and professionally during your residency training and throughout your career. The course uses the Baltimore Museum of Art and other regional museums, as well as a local innovators' space (Fast Forward U) and other non-clinical settings for a combination of small group problem-solving and creating activities. Class sessions will include activities such as open-ended discussions of visual art, music, and poetry; sketching; mask-making; storytelling; and reflective writing. Each week of the course will center on a core theme: 1) family/community, 2) work/education, and 3) self-care. No art knowledge or experience of any kind is required.

Please note: Prior to enrolling voluntarily in this elective, students will be advised that course participation includes taking part in an IRB-approved research study. Each student will be expected to submit four 750-word+ written reflections over the duration of the course (one baseline, two formative, and one summative reflection), both to assess whether course objectives were met and to answer the study's research questions.

**Course Objectives:** -Facilitate deepened student reflection on what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients).

-Facilitate student reflection on one's sense of self in relation to one's family, community, work, and education experiences.

-Facilitate student reflection on how family, community, education, and work experiences offer opportunities for improving one's life satisfaction and happiness, physical and mental health, character, and virtue, meaning and purpose, and close social relationships.

-Facilitate student reflection on the role of the arts and humanities in mastering skills, appreciating multiple perspectives, gaining personal insight, and supporting social advocacy.

-Facilitate student reflection on how the arts and humanities can support self-care and wellbeing.

## THE ONLINE ART MUSEUM: EXPLORING PROFESSIONAL IDENTITY THROUGH ART

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Margaret Chisolm, [mchisol1@jhmi.edu](mailto:mchisol1@jhmi.edu)

**Faculty:** Dr. Margaret Chisolm

**Availability/Duration:** 1 week elective- 2/22/2021-2/26/2021

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### ENROLLMENT LIMITED TO JHUSOM STUDENTS.



**Description:** This course will use visual arts-based teaching methods to facilitate reflection on professional identity. The most used and best studied of these arts-based methods, Visual Thinking Strategies, was developed by former Museum of Modern Art education director, Philip Yenawine, who has graciously agreed to be one of the small group facilitators for the course. The course builds on what you have learned in the College Advisory Program TIME Small Group Teaching Sessions about your sense of self and professional identity. What you learn here will prepare you to thrive personally and professionally during your training and throughout your career. You will engage in interactive online sessions and discussions centered on activities using online collections of art. Other activities will also include music, poetry, sketching, and reflective writing. Topic will include what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients), and self-care. No art knowledge or experience of any kind is required.

**Course Objectives:** - Facilitate student reflection on what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients)  
-Facilitate student reflection on the role of the arts and humanities in developing clinically relevant skills (e.g., observation, communication, clinical reasoning, empathy, appreciation of multiple perspectives, and tolerance for ambiguity)  
-Facilitate student reflection on how the arts and humanities can support self-care and wellbeing.

### EXPLORING PROFESSIONAL IDENTITY THROUGH ART: AN ONLINE ART MUSEUM-BASED ELECTIVE

**Course Type:** Other

**Department/Division:** Psychiatry and Behavioral Sciences and Medicine

**Course Director:** Dr. Margaret Chisolm, [mchisol1@jhmi.edu](mailto:mchisol1@jhmi.edu)

**Faculty:** Dr. Margaret Chisolm, Dr. Heather Kagan, and Dr. Bonnie Marr with guest facilitation by Katie Stouffer and museum educator Philip Yenawine

**Availability/Duration:** This course is available to any 2nd, 3rd, or 4th year JHUSOM student. Enrollment is limited to 15 students, and the course will be offered if at least 5 students enroll. Course will be offered 2/22/21-2/26/21 and 5/3/21-5/7/21.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course will use the arts and humanities to facilitate reflection on professional identity. The most used and best studied of these arts-based methods, Visual Thinking Strategies, was developed by former Museum of Modern Art education director, Philip Yenawine, who has graciously agreed to be one of the small group facilitators for the course. The course builds on what you have learned in the College Advisory Program TIME Small Group Teaching Sessions about your sense of self and professional identity. What you learn here will prepare you to thrive personally and professionally during your training and throughout your career. You will engage in interactive online sessions and discussions centered on activities using online collections of art. Other activities will also include music, poetry, sketching, and reflective writing. Topic will include what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients), and self-care. No art knowledge or experience of any kind is required.

Please note: Prior to enrolling voluntarily in this elective, students will be advised that course participation includes taking part in an IRB-approved research study (IRB00210522; Principal Investigator Margaret Chisolm MD). Each student will be expected to submit two 750-word+ written reflections over the duration of the course (one baseline and one summative reflection) and a pre- and post-course survey to assess whether course objectives were met and to answer the study's research questions.

**Course Objectives:** - Facilitate student reflection on what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients)  
- Facilitate student reflection on the role of the arts and humanities in developing clinically relevant skills (e.g., observation, communication, clinical reasoning, empathy, appreciation of multiple perspectives, tolerance for ambiguity)



- Facilitate student reflection on how the arts and humanities can support self-care and wellbeing

## RESEARCH OPPORTUNITIES

DR. ARNOLD BAKER

Memory impairment in aging and disease; Neuroimaging in neurodegenerative disorders, schizophrenia, depression, and decision making; Clinical trials in Alzheimer's disease.

DR. PATRICK CARROLL

Opportunities for outcomes research and follow-up studies in patients seeking treatment for addictions

DR. RAYMOND DEPAULO

Depression and Bipolar Disorder: The impact on society, their causes and outcomes and research prospects.

DR. FERNANDO GOES

Bipolar Disorder and Major Depression: Opportunities are available for participant in a number of projects related to gene discovery, gene characterization, and gene-phenotypes studies. We have a number of genome-wide association and whole exome/genome studies that could be part of a potential student led project. Opportunities are also available for more clinically related projects and phenotype based secondary analyses.

DR. MARCO A. GRADOS

Research in genetic-epidemiology and clinical registry in children with obsessive-compulsive disorder (Pediatric OCD), Tourette syndrome and attention deficit hyperactivity disorder (ADHD). Risk genetic, neurocognitive, and clinical factors are examined in these disorders.

DR. ROLAND GRIFFITHS

Human behavioral pharmacology of abused drugs

DR. ANGELA GUARDA

Eating disorders; anorexia nervosa and bulimia nervosa

DR. ADAM KAPLIN

Neuropsychiatric aspects of autoimmune CNS diseases; biological basis of immune-mediated depression and cognitive impairment, for example, in Multiple Sclerosis and Transverse Myelitis.

DR. GERALD NESTADT

Obsessive/compulsive disorder: doubt in decision-making.

DR. KARIN NEUFELD

Delirium detection, treatment, and prevention strategies; psychiatric illness and symptomatology of the medically ill

DR. JENNIFER PAYNE

Management of mood disorders in women; clinical trials in depression and bipolar disorder

DR. GLENN TREISMAN

Psychopharmacology; HIV; affective disorders

DR. PETER ZANDI

Depression and Bipolar Disorder: The impact on society, their causes and outcomes and research prospects

## RADIOLOGY AND RADIOLOGICAL SCIENCES

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ME:420.699

### DIAGNOSTIC RADIOLOGY TUTORIAL

**Course Type:** Tutorial

**Department/Division:** Radiology

**Course Director:** Dr. Erin Gomez, Director; egomez8@jhmi.edu and Dr. Javad Azadi, Assistant Director; jazadi1@jhmi.edu

**Telephone Number:** 410-955-2351

**Faculty:** Drs. Gomez, Azadi and staff

**Availability/Duration:** Q12H, Q21H, Q32H, Q41H, Summer 3

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** **Introduction** to the fundamentals of diagnostic and interventional radiology. This course starts with the foundation of how the images are obtained, leading to formulating a differential based on imaging findings and ordering appropriateness. Scanning workshops will be held throughout the course to give medical students hands-on experience in ultrasound, CT, breast imaging and interventional radiology. The course will provide an introduction and overview of the major radiologic subspecialties: body imaging and interventional radiology.

The program includes 3-5 hours per day of lectures and case review for students; use of the American College of Radiology appropriateness criteria; access to multiple online learning files; observation of patient procedures within the department and participation in department didactic and multidisciplinary conferences. A ten-minute case presentation is made during the last week of the course. The final exam is based on the ordering and interpretation of imaging studies in typical clinical settings. Free online textbook available.

### SPECIAL DIAGNOSTIC RADIOLOGY

**Course Type:** Tutorial

**Department/Division:** Radiology

**Course Director:** Appropriate section head - see below

**Telephone Number:** 410-955-6500

**Faculty:** Section Heads or appropriate faculty for Specific Subspecialty Areas

**Availability/Duration:** All year; 4½ weeks or entire quarter

**Prerequisite(s):** To be preceded (usually) by Diagnostic Radiology Tutorial.

**Drop Period:** 1 month

**Description:** A clinical and research experience in a specific subspecialty area of interest to the student.

**Interventional Radiology** – Dr. K. Hong, *Director*; Dr. D. Yim; Dr. C. Weiss

**Body Magnetic Resonance Imaging** – Dr. I. Kamel, *Director*

**Ultrasound** –Dr. S. Coquia, *Director*; Dr. S. Sheth

**Nuclear Medicine:** Dr. Steven Rowe and Dr. Som Javadi

**Musculoskeletal Imaging-** Dr. L. Fayad

**Pediatric Radiology-** Dr. T. Huisman

**Chest Radiology-** Dr. D. Feigin

**GI Radiology-** Meg Fynes

### PRECEPTORSHIP IN DIAGNOSTIC RADIOLOGY – BAYVIEW MEDICAL CENTER

**Course Type:** Tutorial

**Department/Division:** Radiology

**Course Director:** Dr. Martin Auster

**Faculty:** Dr. Auster and staff

**Contact:** Kimberly McCotter; [kmccott1@jhmi.edu](mailto:kmccott1@jhmi.edu)

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RADIOLOGY AND RADIOLOGICAL SCIENCES

**Availability/Duration:** Offered all year; Contact Dr. Auster to determine availability

**Prerequisite(s):** Completion of the preclinical years. Two month drop required

**Drop Period:** 2 months

**Description:** This course is similar to Diagnostic Radiology offered at Johns Hopkins Hospital. During July and August, special lectures will be given to students when four or more students take the elective. Observation of actual film interpretation, attending daily departmental teaching conferences, and observing x-ray procedures in the clinical setting. The role of imaging in the proper management of patient care will be stressed.

### INTERVENTIONAL RADIOLOGY SUBINTERNSHIP AND RESEARCH CLERKSHIP

**Course Type:** Subinternship/Clinical Research

**Department/Division:** Radiology

**Course Director:** Dr. Kelvin Hong, [khong1@jhmi.edu](mailto:khong1@jhmi.edu)

**Contact:** Casey Stinchcomb, [cstinch1@jhmi.edu](mailto:cstinch1@jhmi.edu)

**Telephone Number:** 410-614-1047

**For Availability:** Rocio Friedman, [rfied32@jhmi.edu](mailto:rfied32@jhmi.edu) or 410-614-6938

**Faculty:** Drs. Kelvin Hong, Robert Liddell, Donna Magid, Clifford Weiss and faculty.

**Availability/Duration:** The Clinical Clerkship is offered as a 3, 4½ or 6-week elective; the Subinternship/Research elective is offered for 4½, 5, or 6 weeks (time to be divided equally between Interventional Radiology and the research portion which must be arranged ahead of time) maximum of two students per rotation. Contact Dr. Kelvin Hong at 410-614-2237

**Prerequisite(s):** It is preferred that the student have completed clinical rotations in surgery or medicine prior to this elective

**Drop Period:** 2 months

**Description:** This course allows the student to become familiar with the basic services offered by Interventional Radiology, the risk/benefit ratio of these procedures and an understanding of the diagnostic and therapeutic role of these procedures. The student will learn to conceptualize and problem-solve as it relates to the clinical problems posed by the Interventional Radiology case load. The student should develop fundamental skills in interpreting radiographs, CT scans, ultrasound, and MRI. Physical exam skills will be employed and directed at developing a cardiovascular exam and use of Doppler. The student will be responsible for patient evaluations prior to and following procedures and will gain consent from the patient for basic vascular and nonvascular procedures. Attendance at Wednesday morning conferences, daily morning report and research meetings is expected.

### PEDIATRIC RADIOLOGY

**Course Type:** Consultation Service

**Department/Division:** Radiology

**Course Director:** Dr. Thierry Huisman, [thuisma1@jhmi.edu](mailto:thuisma1@jhmi.edu)

**Telephone Number:** 410-955-6141

**Faculty:** Drs. Huisman and Pediatric Radiology faculty.

**Availability/Duration:** All year; 4½ or 3 weeks

**Prerequisite(s):** Elective in diagnostic radiology

**Drop Period:** 1 month

**Description:** Students will attend conferences in pediatric radiology, observe fluoroscopy, ultrasound, CT, and other examinations, and observe film interpretations. They are expected to add new cases to the Teaching File under staff supervision.

### INTERVENTIONAL RADIOLOGY SUBINTERNSHIP

**Course Type:** Consultation Service/Subinternship

**Department/Division:** Interventional Radiology

**Course Director:** Dr. Kelvin Hong, [khong1@jhmi.edu](mailto:khong1@jhmi.edu)

**Telephone Number:** 410-614-2237

**Faculty:** Drs. C. Weiss and K. Hong

**Availability/Duration:** ½ quarter or 3 weeks

**Prerequisite(s):** Third- or fourth-year students

**Drop Period:** 2 months

**Description:** This elective will familiarize the student with techniques of interventional radiology including balloon angioplasty, therapeutic embolization, and drainage procedures. The student will also become familiar with the radiology of vascular and nonvascular disease. Selected patients are admitted to the interventional radiology service for some of these procedures, and the student will participate in their workup and evaluation including clinic follow up.

### CHEST IMAGING

**Course Type:** Tutorial

**Department/Division:** Radiology

**Course Director:** Dr. David S. Feigin, [dfeigin1@jhmi.edu](mailto:dfeigin1@jhmi.edu)

**Telephone Number:** 410-955-5525

**Faculty:** Dr. Feigin and staff

**Availability/Duration:** Offered all year; 3 weeks; up to 2 students.

**Prerequisite(s):** Fourth year students; previous clerkship in pulmonary/critical care medicine highly desirable

**Drop Period:** 1 month

**Description:** Intensive clinical and educational experience in the diagnostic radiology subspecialty of chest imaging, emphasizing pulmonary and mediastinal radiology using plain films and chest CT. Participation in daily clinical work and case-based teaching sessions, plus attendance at radiology and pulmonary medicine conferences. Individual projects encouraged.

### CLINICAL NEURORADIOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Radiology, Neuroradiology division

**Course Director:** Dr. Doris Lin, [ddmlin@jhmi.edu](mailto:ddmlin@jhmi.edu)

**Faculty:** Dr. Lin and neuroradiology faculty

**Availability/Duration:** Year-round; ½ quarter

**Prerequisite(s):** Diagnostic radiology elective; Core Clerkship in Neurology

**Drop Period:** 1 month

**Description:** This elective combines didactic lectures, videotapes, case reviews and clinical experience. The didactic portion consists of lectures and daily conferences where clinical topics or problems are discussed. The lectures series concentrates in the following areas: CNS and head and neck anatomy and pathology, especially as evaluated by neuroimaging techniques, and development of neuroimaging techniques.

Students will be expected to make a 15–30-minute case presentation at the end of the course on a topic specific to neuroradiology, or in an area of basic or clinical neurosciences relevant to neuroradiology. To receive Honors, the student must work on a research project with a faculty member.

### REMOTE DIAGNOSTIC RADIOLOGY TUTORIAL

**Course Type:** Tutorial

**Department/Division:** Radiology

**Course Director:** Erin Gomez, MD; Javad Azadi, MD

**Telephone Number:** Erin Gomez- [egomez8@jhmi.edu](mailto:egomez8@jhmi.edu); Javad Azadi- [jazadi1@jhmi.edu](mailto:jazadi1@jhmi.edu)

**Faculty:** Erin Gomez, MD, Javad Azadi, MD, Donna Magid, MD, Sheila Sheth, MD, Cheng Ting Lin, MD, Elliot Fishman, MD, Pamela T. Johnson, MD, Stanley S. Siegelman, MD, Jennifer K. Son, MD, Emily Dunn, MD, Daniel Bokhari, MD, Aylin Tekes-Brady, MD, Melissa Spevak, MD, Sachin Gujar, MD, Jay Pillai, MD

**Availability/Duration:** 3-week course; Next Course Offering to be determined.

**Prerequisite(s):** Pre-Clinical Training (MS1 and MS2 years)

**Drop Period:** One month

**ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The Remote Diagnostic Radiology Tutorial provides an introduction to the fundamentals of diagnostic and interventional radiology. This course starts with a foundation in basic imaging physics and an overview of how images are obtained. Students will gain practice in image interpretation and formulating a differential diagnosis based on imaging findings. Additionally, they will learn about appropriate ordering practices related to medical imaging. Interactive case sessions and quizzes will be administered throughout the course to provide exposure to radiography, ultrasound, CT, MRI, and interventional radiology. The course will provide an introduction and overview of the major radiologic subspecialties.

**Course Objectives:**

- Understand the fundamentals of imaging physics and image acquisition related to plain radiographs, fluoroscopy, ultrasound, computed tomography, magnetic resonance imaging and molecular imaging.
- Gain basic proficiency in the “language of Radiology,” including commonly used descriptors and terminology.
- Learn common differential diagnoses in Fluoroscopy, Thoracic and Body Imaging, Neuroradiology, Nuclear Medicine, Musculoskeletal Imaging, Pediatric Imaging and Breast Imaging.
- Learn common differential diagnoses and basic procedures utilized in the field of Interventional Radiology.
- Learn how to use the ACR Appropriateness Criteria to select the best imaging study for a specific clinical question or scenario.
- Learn how to appropriately request medical imaging.
- Gain introductory-level experience in interpreting medical images.
- Understand the basics of artificial intelligence and its evolving role in the practice of Radiology.

### RESEARCH OPPORTUNITIES

DR. MARTIN AUSTER

Clinical research in diagnostic imaging, focusing on general or interventional radiology imaging or the delivery of imaging services

DR. NAFI AYGUN

Neuroradiology

DR. ARI BLITZ

Neuroradiology

DR. NICHOLAS ELLENS

MRI guided therapeutic ultrasound; thermal ablation and targeted drug delivery

DR. JOHN ENG

Evidence-based radiology; statistical analysis of imaging tests and radiology informatics

Dr. LAURA FAYAD

Anatomic, functional, and metabolic imaging of musculoskeletal tumors

DR. ELLIOT FISHMAN

Body CT; web-based education; use of social media for medical education and medical information sharing

DR. MEG FYNES

Swallowing function and esophageal imaging

DR. PHILIPPE GAILLOUD

Neurointerventional radiology

DR. ASSAF GILAD

Development of genetically encoded biosensors for imaging intracellular signal transduction at the cellular level with MRI

DR. ULRIKE HAMPER

Ultrasound research

DR. KELVIN HONG

Value added research in interventional radiology

DR. THIERRY HUISMAN

Advanced MRI imaging in Pediatric Neuroradiology; clinically oriented

DR. IHAB KAMEL

Magnetic resonance imaging

DR. DARA KRAITCHMAN

Molecular imaging; stem cell tracking; veterinary minimally invasive procedures and image-guided therapy

DR. MICHAEL KRAUT

Functional magnetic resonance imaging

DR. SRIDHAR NIMMAGADDA

Chemokine receptor target imaging, therapy, and biology

Dr. HARIS SAIR

Resting state functional MR brain imaging for disease diagnosis and prediction

DR. JEFF SIEWERDSEN

Image quality in low dose CT; 3D printing in medical imaging; quantitative imaging of bone morphology as an image-based biomarker

DR. FRANCO VERDE

Vascular, small bowel, and pancreatic imaging; quality improvement; informatics

DR. PIOTR WALCZAK

Magnetic Resonance Research

DR. CLIFFORD WEISS

Interventional radiology

DR. DAVID YOUSEM

Functional magnetic resonance imaging

DR. YUN ZHOU

Quantitative functional imaging with dynamic PET, CT and MRI and its applications in neurodegenerative disease and oncology

DR. STEFAN ZIMMERMAN

Investigating advanced cardiac MRI techniques for identifying imaging biomarkers in non-ischemic cardiomyopathies arrhythmias and pulmonary hypertension

## RADIATION ONCOLOGY

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ME:717.699

### BASIC RADIOLOGIC PHYSICS

**Course Type:** Tutorial

**Department/Division:** Radiation Oncology

**Course Director:** Dr. John Wong

**Telephone Number:** 410-502-1458

**Faculty:** Dr. Wong and staff

**Availability/Duration:** Q1 & Q3; Mon & Wed 5:00-6:30 p.m.

**Prerequisite(s):** General physics and mathematics; consent of instructor

**Drop Period:** 1 month

**Description:** Radiation physics concepts essential for individuals pursuing careers in radiology, radiotherapy, or medical physics. Lecture and laboratory topics include radioactive decay, x-ray production, interaction of ionizing radiation with matter and measurement of radiation.

### RADIOBIOLOGY

**Course Type:** Tutorial

**Department/Division:** Radiation Oncology

**Course Director:** Dr. Marikki Laiho

**Telephone Number:** 410-502-9748

**Faculty:** Dr. Laiho and Radiation Oncology Faculty

**Availability/Duration:** Q2; Mon 7:30-9:00 a.m.

**Prerequisite(s):** General cell and molecular biology; consent of instructor

**Drop Period:** 1 month

**Description:** DNA damage and radiobiology concepts essential for individuals pursuing careers in radiation oncology and oncology. Lecture topics include DNA damage response, signaling and repair, cell cycle checkpoints, environmental cues affecting damage response, radiation sensitizers and protectors.

### SPECIAL TOPICS IN RADIATION ONCOLOGY PHYSICS

**Course Type:** Tutorial

**Department/Division:** Radiation Oncology

**Course Director:** Dr. John Wong

**Telephone Number:** 410-502-1458

**Faculty:** Dr. Wong and staff

**Availability/Duration:** All year; every other Friday 3:00-4:00 p.m.

**Prerequisite(s):** Consent of instructor

**Drop Period:** 1 month

**Description:** An advanced course dedicated to the discussion of developing technology and special techniques, including Radio-labeled Antibody Dosimetry, Stereotactic Radiosurgery, Total Body Irradiation, 3-Dimensional Treatment Planning, Hyperthermia and Digital Portal Imaging.

### RADIOLOGY ONCOLOGY: CONSULT SERVICE

**Course Type:** Consult Service

**Department/Division:** Radiation Oncology

**Course Director:** Dr. Amol Narang

**Contact:** Ruth Lewis; 410-955-7390; rlewisf@jhmi.edu

**Faculty:** Drs. Alcorn, Asrari, Croog, Deville, DeWeese, Hales, Kiess, Kleinberg, Ladra, Meyer, Narang, Page, Quon, Redmond, Song, Tran, Viswanathan, Vogel, Voong, Wright

([https://www.hopkinsmedicine.org/radiation\\_oncology/about\\_us/meet\\_our\\_experts/index.html](https://www.hopkinsmedicine.org/radiation_oncology/about_us/meet_our_experts/index.html))

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RADIATION ONCOLOGY

**Availability/Duration:** All year; up to 4 weeks

**Prerequisite(s):** Core Clerkship in Medicine or Surgery preferred, albeit not required

Drop Period: 1 month

**Description:** This course introduces medical students to the field of radiation oncology. Radiation therapy is one of three primary treatment modalities used for patients with cancer (along with surgery and chemotherapy) and is administered for most patients with cancer at some point during their treatment course. It is an exciting field that combines new technologies with the intimacy of cancer care. During this rotation, students will have the opportunity to assist faculty with new patient consultations, follow-up evaluations, and on-treatment patient management, while also being introduced to the radiation treatment process, including simulations, contouring, treatment planning, and treatment delivery. Students will work with a variety of faculty members to assure a broad experience, including specialists in CNS, Head & Neck, Thoracic, Breast, Gastrointestinal, Genitourinary, Gynecologic, Hematologic, and Pediatric malignancies. This elective opportunity will be particularly valuable to students considering a career in an oncology-related field.

### ONLINE INTRODUCTION TO RADIATION ONCOLOGY

**Course Type:** Other

**Department/Division:** Radiation Oncology

**Course Director:** Dr. Amol Narang, [anarang2@jhmi.edu](mailto:anarang2@jhmi.edu) and Dr. Brandi Page, [bpage5@jhmi.edu](mailto:bpage5@jhmi.edu)

**Contact Information:** Joyce Schanne, [jschann1@jhmi.edu](mailto:jschann1@jhmi.edu)

**Faculty:** Multiple faculty in Radiation Oncology

**Availability/Duration:** 2-week elective- 6/1/2020-6/12/2020, 6/22/2020-7/2/2020, 7/13/2020-7/24/2020, and 8/3/2020-8/14/2020; This is a part time course, students will receive 1 week of elective credit for this experience.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Online Introduction to Radiation Oncology will introduce students to the fundamentals of Radiation Oncology. Radiation Oncology represents one of the three main disciplines within cancer care, along with Medical Oncology and Surgery Oncology. In this course, students will first learn the basic principles of how therapeutic radiation is produced and the mechanism through which radiation damages cancer cells. Students will subsequently learn about the complex workflow that is required to accurately deliver radiation to tumors. Thereafter, disease site-specific lectures will be provided in which students will be introduced to how radiation is used for cancers across the body, including central nervous system, head, and neck, thoracic, breast, abdominal, genitourinary, gynecologic, and pediatric malignancies. Furthermore, students will have the opportunity to observe and participate in patient encounters through televisits through which students will gain insight into the complexities of oncologic decision-making and patient counseling. Additionally, students will be introduced to the process of contouring and treatment planning to understand how radiation treatment plans are designed. Students will also have the option to give a short presentation at the end of the rotation on the topic of their choice. As radiation therapy presents a critical treatment modality for the vast majority of cancers, this course is highly recommended for any student considering a career in any oncologic discipline, but it will also be applicable for students going into any field.

**Course Objectives:** -Learn the basic radiation physics and biology principles of radiation therapy

-Learn how radiation is incorporated into the treatment plans across a variety of tumor types

-Observe and participate in patient encounters through televisits to gain insight into oncologic decision-making and patient counseling

### RESEARCH OPPORTUNITIES

As a leader nationally in oncology research, opportunities for students to get involved in research are abundant. Research opportunities can be clinical, basic, physics-related, or health services-related. Please feel free to contact Dr. Amol Narang directly if interested in research opportunities.



DR. F. BUNZ

Responses of cancer cells to DNA damage; human cell genetics

DR. T. DEWEESE

Genitourinary system tumors; gene therapy

DR. R. HALES

Lung cancer and thoracic oncology

DR. R. IVKOV

Nanomaterials in targeting cancers

DR. M. KAI

DNA damage response

DR. A. KIESS

Head and neck cancer

DR. L. KLEINBERG

Diseases of the central nervous system cancer

DR. M. LAIHO

Genetic response to DNA damage; transcription

DR. T. MCNUTT

Radiation Physics

DR. H. QUON

Head and neck cancer

DR. K. REDMOND

Diseases of the central nervous system

DR. D. SONG

Genitourinary tumors; lung and thoracic tumors; prostate brachytherapy

DR. P. TRAN

Genitourinary tumors; oligometastatic disease; molecular biology in cancer

## SURGERY AND SURGICAL SCIENCES

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ME:380.699

### SURGICAL ONCOLOGY - NATIONAL CANCER INSTITUTE, NATIONAL INSTITUTES OF HEALTH, BETHESDA, MD

**Course Type:** Clinical Clerkship  
**Department/Division:** Surgery  
**Course Director:** Dr. David Danforth  
**Telephone Number:** 410-955-5765  
**Faculty:** Dr. Danforth and Dr. Steven Rosenberg,  
**Availability/Duration:** All year; up to 2 full quarters.  
**Prerequisite(s):** Core Clerkship in Surgery  
**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Students will see new outpatients and follow their progress through the initial workup in the clinic and hospital. Students will assist in the surgical procedures and postoperative care. Attendance at all departmental conferences and meetings, as well as weekly departmental seminars, is expected. Students have intensive exposure to this combination of medical endeavors due to the close interrelationship of clinical and research activities in the Surgery Branch of the National Cancer Institute. Clinical work centers around formal research protocol patients. Currently the branch is concentrating its attention on protocols concerned with investigation of melanoma, osteosarcoma, and a variety of soft tissue sarcomas, rectal cancer, and breast cancer. The surgery branch also serves as a general surgical consultant for all patients at the National Institutes of Health. In this capacity, a broad range of general surgical problems are also seen.

### SUBINTERNSHIP IN SURGERY

#### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship  
**Department/Division:** Surgery and Surgical Sciences  
**Course Director:** Dr. Alodia Gabre-Kidan  
**Contact:** Misty Grimes: 410-502-5062, [misty@jhmi.edu](mailto:misty@jhmi.edu)  
**Faculty:** Dr. Alodia Gabre-Kidan and surgical staff  
**Availability/Duration:** All year; 4½ weeks; registration must be at least 8 weeks before this elective as credentialing is required by the Medical Board  
**Prerequisite(s):** Core Clerkship in Surgery  
**Drop Period:** 2 months

#### **VISITING MEDICAL STUDENTS FROM NON-LCME ACCREDITED SCHOOLS CANNOT APPLY FOR THE SUBINTERNSHIP IN QUARTER 4 OR THE SUMMER QUARTER**

**Description:** This course is designed to provide extensive, in-depth experience in the management of the surgical patient. The student will be an integral part of the surgical team and will be assigned specific patients. The activities of the student will be supervised by the attending and house staff. Services available: GI surgery, vascular surgery, Halstead-trauma, and surgical oncology to include breast, endocrine, and melanoma. The subintern will have responsibility for pre and postoperative care of patients and will participate in the operative procedures. Daily rounds with attendings and residents, as well as several special conferences and teaching sessions each week are part of this course.

### SUBINTERNSHIP IN GENERAL SURGERY – BAYVIEW MEDICAL CENTER

#### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship  
**Department/Division:** Surgery and Surgical Sciences  
**Course Director:** Dr. Alodia Gabre-Kidan  
**Contact:** Misty Grimes: 410-502-5062, [misty@jhmi.edu](mailto:misty@jhmi.edu)

**Faculty:** Bayview surgical staff

**Availability/Duration:** Available quarters 1-4; 4½ weeks

**Prerequisite(s):** Core Clerkship in Surgery

**Drop Period:** 2 months

**VISITING MEDICAL STUDENTS FROM NON-LCME ACCREDITED SCHOOLS CANNOT APPLY FOR THE SUBINTERNSHIP IN QUARTER 4 OR THE SUMMER QUARTER**

**Description:** This course is designed to provide extensive, in-depth experience in the management of the surgical patient. The student will be an integral part of the surgical team and will be assigned specific patients. The activities of the student will be supervised by the attending and house staff. Services available: vascular, bariatric, GI, and surgical oncology. The subintern will have responsibility for pre and postoperative care of patients and will participate in the operative procedures. Daily rounds with attendings and residents, as well as several special conferences and teaching sessions each week are part of this course.

#### VASCULAR AND ENDOVASCULAR SURGERY ELECTIVE ROTATION BAVIEW MEDICAL CENTER

**Course Type:** Clinical Clerkship

**Department/Division:** Surgery and Surgical Sciences

**Course Director:** Dr. Mahmoud B. Malas

**Contact:** 410-507-2131; [bmalas1@jhmi.edu](mailto:bmalas1@jhmi.edu)

**Faculty:** Dr. Mahmoud B. Malas

**Availability/Duration:** All year long/four-to-eight-week periods

**Prerequisite(s):** Medical Student-HIPAA Certification prior to the start of the elective

**Drop Period:** 2 months

**VISITING MEDICAL STUDENTS FROM NON-LCME ACCREDITED SCHOOLS CANNOT APPLY FOR THE SUBINTERNSHIP IN QUARTER 4 OR THE SUMMER QUARTER**

**Description:** Students can join the Johns Hopkins Bayview Vascular and Endovascular Surgery Elective rotation for 4-to-8-week periods. They are expected to participate in patient care, round on patients in the ward with the interns and surgical residents and to participate in a variety of open and endovascular cases in the operative room. They are also expected to attend the vascular clinic at least one day a week and to contribute to a research project at the vascular and endovascular research center at Johns Hopkins Bayview Medical Center.

**Objectives:** At the end of the rotation, medical students will have a good understanding of basic vascular pathology, noninvasive vascular testing, and angiography. They will learn how to perform a vascular exam and will have adequate knowledge of the diagnosis, prevention and treatment options of major vascular pathologies such as peripheral arterial disease, abdominal and thoracic aortic aneurysms, carotid artery stenosis, dialysis access for end stage renal disease and diabetic foot infection.

#### ADVANCED CLERKSHIP IN NONCARDIAC THORACIC SURGERY

##### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Clinical Clerkship

**Department/Division:** Surgery and Surgical Sciences

**Course Director:** Dr. Alodia Gabre-Kidan

**Contact:** Misty Grimes: 410-502-5062, [misty@jhmi.edu](mailto:misty@jhmi.edu)

**Faculty:** Thoracic Surgical staff

**Availability/Duration:** 4½ weeks

**Prerequisite(s):** Core Clerkship in Surgery

**Drop Period:** 2 months

**VISITING MEDICAL STUDENTS FROM NON-LCME ACCREDITED SCHOOLS CANNOT APPLY FOR THE SUBINTERNSHIP IN QUARTER 4 OR THE SUMMER QUARTER**

**Description:** An advanced experience in thoracic surgery; involves patient care, operating room, and clinic experiences. Research projects are also possible. Conferences and teaching sessions included.

#### ADVANCED CLERKSHIP IN SURGICAL ONCOLOGY

**Course Type:** Clinical Clerkship  
**Department/Division:** Surgery and Surgical Sciences  
**Course Director:** Dr. Alodia Gabre-Kidan  
**Contact:** Misty Grimes: 410-502-5062, [misty@jhmi.edu](mailto:misty@jhmi.edu)  
**Faculty:** Handelsman Surgery staff  
**Availability/Duration:** 4½ weeks  
**Prerequisite(s):** Core Clerkship in Surgery  
**Drop Period:** 2 months

**VISITING MEDICAL STUDENTS FROM NON-LCME ACCREDITED SCHOOLS CANNOT APPLY FOR THE SUBINTERNSHIP IN QUARTER 4 OR THE SUMMER QUARTER**

**Description:** This elective is designed to provide students with an academic multidisciplinary approach to solid tumors. Both clinical and research experiences are available. The clinical exposure is provided by rotating through the Surgical Oncology service, and the research interests are centered around immunologic manipulations of the host in solid tumor rejection.

#### ADVANCED CLERKSHIP IN VASCULAR SURGERY

**Course Type:** Clinical Clerkship  
**Department/Division:** Surgery and Surgical Sciences  
**Course Director:** Dr. Alodia Gabre-Kidan  
**Contact:** Misty Grimes: 410-502-5062, [misty@jhmi.edu](mailto:misty@jhmi.edu)  
**Faculty:** Vascular Surgery Staff  
**Availability/Duration:** 4½ weeks  
**Prerequisite(s):** Core Clerkship in Surgery  
**Drop Period:** 2 months

**VISITING MEDICAL STUDENTS FROM NON-LCME ACCREDITED SCHOOLS CANNOT APPLY FOR THE SUBINTERNSHIP IN QUARTER 4 OR THE SUMMER QUARTER**

**Description:** This elective provides exposure to vascular surgery patients. Students will participate in all aspects of patient care: pre-op evaluation, operative procedures, post-op care.

#### ADVANCED CLERKSHIP IN ALIMENTARY TRACT SURGERY

**Course Type:** Clinical Clerkship  
**Department/Division:** Surgery and Surgical Sciences  
**Course Director:** Dr. Alodia Gabre-Kidan  
**Contact:** Misty Grimes: 410-502-5062, [misty@jhmi.edu](mailto:misty@jhmi.edu)  
**Faculty:** Drs. Ravich and Surgical staff  
**Availability/Duration:** 4½ weeks  
**Prerequisite(s):** Core Clerkship in Surgery  
**Drop Period:** 2 months

**VISITING MEDICAL STUDENTS FROM NON-LCME ACCREDITED SCHOOLS CANNOT APPLY FOR THE SUBINTERNSHIP IN QUARTER 4 OR THE SUMMER QUARTER**

**Description:** This elective provides comprehensive exposure to GI surgery patients. Students will participate in all aspects of care: pre-op evaluation, operative procedures, and post-op care.

### CARDIAC SURGERY RESEARCH ROTATION

**Course Type:** Clinical Research/ Basic Research

**Department/Division:** Cardiac Surgery

**Course Director:** Dr. William Baumgartner

**Telephone Number:** 410-955-2411

**Faculty:** Dr. William Baumgartner and Staff

**Availability/Duration:** Summer only; not available summer 2017, must be willing to spend at least two months in elective

**Prerequisite(s):** Completion of first year of medical school

**Drop Period:** 2 months

**Description:** Students can expect an excellent exposure to the preoperative, operative, and postoperative care of both large and small animals. Furthermore, students can expect to develop basic and intermediate to advanced surgical skills. Students will also have the opportunity to participate in our prospective and retrospective clinical studies evaluating important issues in both adult and pediatric cardiac surgery.

### ADVANCED CLINICAL CLERKSHIP IN GENERAL PEDIATRIC SURGERY

**Course Type:** Clinical Clerkship

**Department/Division:** Surgery and Surgical Sciences

**Course Director:** Dr. Alodia Gabre-Kidan

**Contact:** Misty Grimes: 410-502-5062, [misty@jhmi.edu](mailto:misty@jhmi.edu)

**Faculty:** Dr. David Hackam and Staff

**Availability/Duration:** All year; 4½ or 9 weeks

**Prerequisite(s):** Core Clerkships in Surgery and Pediatrics

**Drop Period:** 2 months

### **VISITING MEDICAL STUDENTS FROM NON-LCME ACCREDITED SCHOOLS CANNOT APPLY FOR THE SUBINTERNSHIP IN QUARTER 4 OR THE SUMMER QUARTER**

**Description:** This elective is designed to provide clinical experience in the management of children with surgical problems, including trauma. Participation in ward and operating room as a surgical extern. This elective includes Pediatric Surgical Clinic and Pediatric Surgery Teaching Rounds, as well as exposure to a wide variety of pediatric surgical inpatient and outpatient cases.

### PEDIATRIC SURGERY AT ALL CHILDREN'S HOSPITAL

**Course Type:** Other

**Department/Division:** Pediatric Surgery, All Children's Hospital (ACH), St. Petersburg, FL

**Course Director:** Dr. Elizabeth Walford

**Telephone Number:** 727-767-4106, Gwen Harmon, [ggharmon2@jhmi.edu](mailto:ggharmon2@jhmi.edu), Dawn Jones [dawn.jones@jhmi.edu](mailto:dawn.jones@jhmi.edu)

**Faculty:** Drs. Nicole Chandler, Paul Colombani, Paul Danielson, David Kays and Elizabeth Walford

**Availability/Duration:** Rolling availability; duration is flexible and can be adjusted to fit student needs.

**Prerequisite(s):** Core Clerkship in Pediatrics or Medicine

**Drop Period:** 2 months

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Principles of pediatric surgery will be taught in outpatient and inpatient encounters at ACH-JHM. As a free-standing children's hospital, patient cases will reflect both general pediatric surgical exposure as well as exposure to highly specialized patient cases reflecting ACH-JHM's status as a quaternary care center. Participation in clinical or basic research in pediatric surgery may also be coordinated pending project and faculty availability.

Students will attend daily surgical clinics at ACH and scrub into operative procedures. Emphasis will be placed on the understanding of the pathogenesis, diagnosis, and management of common conditions requiring surgery in the pediatric patient.

Students will gain an appreciation of the effect of anesthetics, surgical procedures, and critical illnesses on the pediatric patient. They will become familiar with parenteral fluid management and the philosophy of oral and parenteral nutritional needs for the pediatric surgical patient. Students are expected to participate in weekly conferences including surgical specific conferences as well as resident noon conferences, JHUSOM Pediatric Grand Rounds and ACH-JHM Grand Rounds.

Students will become familiar with the pathogenesis, diagnosis and management of common conditions requiring surgery in pediatric patient, such as inguinal-scrotal conditions, appendicitis, and other gastrointestinal inflammatory and obstructive states, airway problems, and congenital abnormalities amenable to surgical correction. The student will be evaluated on faculty evaluations, attendance, and overall performance.

#### **ADVANCED CLERKSHIP IN TRANSPLANTATION SURGERY**

**Course Type:** Clinical Clerkship  
**Department/Division:** Transplantation Surgery  
**Course Director:** Dr. Alodia Gabre-Kidan  
**Contact:** Misty Grimes: 410-502-5062, [misty@jhmi.edu](mailto:misty@jhmi.edu)  
**Faculty:** Transplant Surgery faculty  
**Availability/Duration:** All year, 4½ weeks; limited to one student  
**Prerequisite(s):** Core Clerkship in Surgery  
**Drop Period:** 2 months

#### **VISITING MEDICAL STUDENTS FROM NON-LCME ACCREDITED SCHOOLS CANNOT APPLY FOR THE SUBINTERNSHIP IN QUARTER 4 OR THE SUMMER QUARTER**

**Description:** Includes participation in management of patients undergoing renal dialysis, renal, pancreas and hepatic transplantation at the Johns Hopkins Hospital. Experience in immunology as it applies to transplantation will be included.

#### **EQUITABLE HEALTHCARE- A VIRTUAL CLINICAL ELECTIVE IN SURGERY/PEDIATRIC SURGERY**

**Course Type:** Other  
**Department/Division:** Surgery and Surgical Sciences  
**Course Director:** Dr. Robert S.D. Higgins, [rhigg11@jhmi.edu](mailto:rhigg11@jhmi.edu), Dr. Fabian Johnston, [fjohnst4@jhmi.edu](mailto:fjohnst4@jhmi.edu), Dr. Clint Cappiello, [ccappie1@jhmi.edu](mailto:ccappie1@jhmi.edu), Dr. Alodia Gabre-Kidan, [agabrek1@jhmi.edu](mailto:agabrek1@jhmi.edu), and Dr. Malcolm V. Brock, [mabrock@jhmi.edu](mailto:mabrock@jhmi.edu)  
**Availability/Duration:** 2-week elective; Capacity- 3 learners; Next Course Offering to be determined.  
**Prerequisite(s):** Completion of surgery core clerkship  
**Drop Period:** N/A

#### **ENROLLMENT LIMITED TO VISITING MEDICAL STUDENTS.**

**Description:** This course is a 2-week virtual clinical experience for students to engage in clinical and learning opportunities in the field of Surgery/Pediatric Surgery. It is designed for students who have already completed a surgery core clerkship and plan to apply into a Surgery residency. The course will consist of a shared, universal curriculum that will cover topics such as health disparities, global health, LGBTQIA+ health, telemedicine, palliative care, and community resources in Baltimore. The specialty-specific curriculum will explore equitable healthcare within Surgery through patient interviews, case presentations, departmental conferences, didactics, and team discussion, allowing students to refine their skills while networking with residents and faculty.

#### **RESEARCH IN NEUROSURGERY**

**Course Type:** Basic Research  
**Department/Division:** Neurosurgery  
**Availability/Duration:** Full quarter or more  
**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** Students may work in any of the departmental laboratories by arranging with the individual faculty members and laboratory directors.

### NEUROPHYSIOLOGIC STUDIES OF HUMAN CNS IN PAIN AND MOVEMENT

**Course Type:** Clinical Research

**Department/Division:** Neurosurgery

**Course Director:** Dr. Frederick Lenz

**Telephone Number:** 410-955-2257

**Faculty:** Dr. Frederick Lenz

**Availability/Duration:** By arrangement

**Prerequisite(s):** Neuroanatomy

**Drop Period:** 1 month

**Description:** Single neuron analysis of the human CNS during stereotactic procedures for pain and movement disorders.

### CLINICAL CLERKSHIP IN NEUROSURGERY

**Course Type:** Clinical Clerkship

**Department/Division:** Neurosurgery

**Course Director:** Dr. Alan Cohen

**Telephone Number:** 410-502-5564

**Faculty:** Neurosurgery Faculty

**Availability/Duration:** All year; 4½ weeks

**Prerequisite(s):** Open to 3<sup>rd</sup> and 4<sup>th</sup> year medical students

**Drop Period:** 2 months

**Description:** This clinical clerkship will provide an introduction to the care of adult and pediatric patients with brain tumors, cerebrovascular diseases, spinal and peripheral nerve disorders, and trauma in both the inpatient and outpatient settings. Students will participate in the operating room, clinics, inpatient wards, and departmental conferences. This clerkship may be performed at either the Johns Hopkins Hospital or the Johns Hopkins Bayview Medical Center campus, or a combination of both sites.

### INTRODUCTION TO NEUROSURGERY

**Course Type:** Clinical Clerkship

**Department/Division:** Neurosurgery

**Course Director:** Dr. Tim Witham

**Contact:** Colleen Hickson; 667-306-6327

**Faculty:** Neurosurgery faculty

**Availability/Duration:** All year; 4½ weeks

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** This course gives the student an introduction to the field of neurosurgery. The student will learn the fundamentals of performing a neurological exam, as well as a neurosurgery history and physical. The course provides an exposure to the broad spectrum of neurosurgical pathology in the inpatient and outpatient settings. Time is divided between the neurosurgical oncology, spine, vascular, and pediatric services. Students will participate in rounds, inpatient care, in the operating rooms, and the outpatient clinic. Students will also attend departmental didactic teaching conferences, such as Spine Conference, Vascular Conference, Tumor Conference, Peds Conference and Neurosurgery Grand Rounds.

## SUBINTERNSHIP IN NEUROSURGERY

### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship  
**Department/Division:** Neurosurgery  
**Course Director:** Dr. Timothy Witham  
**Contact:** Colleen Hickson; 667-306-6327  
**Faculty:** Neurosurgery Faculty  
**Availability/Duration:** All year; 4 weeks  
**Prerequisite(s):** Core Clerkship in Surgery  
**Drop Period:** 2 months

### **VISITING MEDICAL STUDENTS FROM NON-LCME ACCREDITED SCHOOLS CANNOT APPLY FOR THE SUBINTERNSHIP IN THE SUMMER QUARTER**

Visiting Medical Students- Please review additional departmental application requirements at:  
[https://www.hopkinsmedicine.org/neurology\\_neurosurgery/education/neurosurgery\\_electives/how\\_to\\_apply/](https://www.hopkinsmedicine.org/neurology_neurosurgery/education/neurosurgery_electives/how_to_apply/)

**Description:** Students are given significant responsibilities in patient care and a broad exposure in neurosurgical operating room techniques. Time is divided between the neurosurgical oncology, spine, cerebrovascular, and pediatric services. Students will participate in daily rounds, inpatient care, departmental conferences, operating rooms, and outpatient clinic. Subinterns will participate in overnight call with a supervising resident. Rotations will be at the Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center campuses.

## EQUITABLE HEALTHCARE- A VIRTUAL CLINICAL ELECTIVE IN NEUROSURGERY

**Course Type:** Other  
**Department/Division:** Neurosurgery  
**Course Director:** Dr. Alan R. Cohen, [alan.cohen@jhmi.edu](mailto:alan.cohen@jhmi.edu)  
**Availability/Duration:** Next Course Offering to be determined.  
**Prerequisite(s):** Completion of surgery core clerkship  
**Drop Period:** N/A

### **ENROLLMENT LIMITED TO VISITING MEDICAL STUDENTS.**

**Description:** This course is a 2-week virtual clinical experience for students to engage in clinical and learning opportunities in the field of Neurosurgery. It is designed for students who have already completed a surgery core clerkship and plan to apply into a Neurosurgery residency. The course will consist of a shared, universal curriculum that will cover topics such as health disparities, global health, LGBTQIA+ health, telemedicine, palliative care, and community resources in Baltimore. The specialty-specific curriculum will explore equitable healthcare within Neurosurgery through patient interviews, case presentations, departmental conferences, didactics, and team discussion, allowing students to refine their skills while networking with residents and faculty.

## ADVANCED CLERKSHIP IN HAND SURGERY

**Course Type:** Clinical Clerkship  
**Department/Division:** Orthopaedic Surgery  
**Course Director:** Dawn LaPorte, MD  
**Telephone Number:** Beth Hall 410-955-8344  
**Faculty:** Drs. LaPorte, Strike, and Nguyen  
**Availability/Duration:** One position at a time; 4 weeks  
**Prerequisite(s):** Core Clerkship in Surgery  
**Drop Period:** 2 months

**Description:** This course is about learning the evaluation, diagnosis, and management of patients with hand and upper extremity injury and pathology. It builds on what you learned in your musculoskeletal unit in Genes to Society as well as on your Surgery clerkship. The Hand Surgery Sub-I builds on earlier learning in anatomy,



physiology, microbiology, general ethics, and interpersonal relations. It translates concepts into concrete action with immediate results. What you learn here will prepare you for evaluating patients who present with injuries or complaints regarding the hand, wrist, and elbow. This includes young children born with upper extremity abnormalities, all age groups with traumatic injuries, nerve injury or compression, arthritis, and other conditions. The course uses a combination of lecture, reading, conferences, and time in the hand clinic and in the operating room to teach important principles. The student learns from a team of residents PGY3+4, fellows, and four attending surgeons. These team members provide continuous teaching and feedback. Collegiality is a hallmark of the service.

#### **ADVANCED CLINICAL CLERKSHIP IN ORTHOPAEDIC FOOT AND ANKLE SURGERY**

**Course Type:** Clinical Clerkship

**Department/Division:** Orthopaedic Surgery-JHH and Bayview

**Course Director:** Dr. Amiethab Aiyer

**Telephone Number:** Beth Hall, 410-955-8344

**Faculty:** Drs. Amiethab Aiyer and James Ficke

**Availability/Duration:** One position offered at a time; four weeks

**Prerequisite(s):** Preference is given to second semester third year students and to fourth year students.

**Drop Period:** 2 months

**Description:** This elective provides an overview of the evaluation and treatment of patients with foot and ankle pathology. It will include a focus on trauma to the foot and ankle, sports injuries, tendinopathy and reconstruction for deformities and arthritis. The student will participate in clinic and operative settings as well as following the inpatients after surgery. Students must have transportation between JHH, JH Bayview and JH White Marsh. Students must be flexible in their approach as faculty are located at multiple sites.

#### **EXPOSURE TO SPINAL DISEASES**

**Course Type:** Clinical Clerkship

**Department/Division:** Orthopaedic Surgery

**Course Director:** Dr. Brian J. Neuman

**Telephone Number:** Beth Hall, 410-955-8344, [bkeefe2@jhmi.edu](mailto:bkeefe2@jhmi.edu)

**Faculty:** Drs. Lee Riley, III, Khaled Kebaish, David Cohen, Brian Neuman, Sang Hun Lee, and Amit Jain

**Availability/Duration:** All year; 1 month duration

**Prerequisite(s):** Core Clerkship in Surgery

**Drop Period:** 1 month

**Description:** This course is offered primarily for the student who thinks that he/she may be interested in orthopaedic surgery as a career. The student can expect to gain knowledge and experience in the preoperative evaluation, spinal surgical procedures, and postoperative care of patients with a wide variety of spinal diseases through hands-on participation in outpatient clinics, operating rooms, and didactic teaching.

#### **ADVANCED CLINICAL CLERKSHIP IN SPINE SURGERY**

**Course Type:** Clinical Clerkship

**Department/Division:** Orthopaedic Surgery

**Course Director:** Dr. Lee Riley, III

**Telephone Number:** Beth Hall - 410-955-8344

**Faculty:** Drs. Lee Riley, III, Khaled Kebaish, David Cohen, Brian Neuman, Sang Hun Lee, and Amit Jain

**Availability/Duration:** All year; four weeks; one or two students; preference given to second semester 3<sup>rd</sup> Year Students and 4<sup>th</sup> Year Students.

**Prerequisite(s):** Core Clerkship in Surgery; Core Clerkship in Medicine helpful

**Drop Period:** 1 month

**Description:** This elective provides in-depth clinical experience in orthopaedic spine surgery at the Johns Hopkins Hospital. The student is integrated into the orthopaedic residency program. Practical experience is supplemented

by formal and informal teaching conferences and patient rounds. One or two positions offered at a time. Preference is given to second semester, third year students and to fourth year students. Duration four weeks.

### ORTHOPAEDIC SURGERY – BAYVIEW MEDICAL CENTER

#### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship

**Department/Division:** Orthopaedic Surgery

**Course Director:** Dr. Paul Khanuja

**Telephone Number:** Beth Hall, 410-955-8344, [bkeefe2@jhmi.edu](mailto:bkeefe2@jhmi.edu)

**Faculty:** Drs. Paul Khanuja, Sterling, Byank, Sotsky, and Hughes

**Availability/Duration:** All year; one student, full or ½ quarter

**Prerequisite(s):** 4th year student with prior Orthopaedic rotation experience; Core Clerkship in Surgery

**Drop Period:** 1 month

**Description:** This elective is offered to students seeking more extensive knowledge of general orthopaedics than is usually obtained in the required curriculum. Musculoskeletal trauma, total joint arthroplasty and foot and ankle pathology are emphasized. During this elective, students are actively involved with the resident staff in all aspects of patient care. They are expected to participate in the same educational conferences as the resident staff. They are expected to broaden their knowledge of the physiological basis of orthopaedic practice and to acquire a better understanding of appropriate diagnostic and therapeutic techniques. Students also have the opportunity to learn about the training and development of orthopaedic surgeons, to acquire useful information in making a career choice and to develop reference contacts.

### SUBINTERSHIP IN ORTHOPAEDIC SURGERY

#### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship

**Department/Division:** Orthopaedic Surgery

**Course Director:** Dr. Greg Osgood

**Telephone Number:** Beth Hall, 410-955-8344, [bkeefe2@jhmi.edu](mailto:bkeefe2@jhmi.edu)

**Faculty:** Drs. Greg Osgood and Babar Shafiq

**Availability/Duration:** All year; 2 students per half quarter

**Prerequisite(s):** Core Clerkship in Surgery

**Drop Period:** 2 months

**Description:** This is a clinical course in adult trauma orthopaedics. The participant is exposed to different aspects of this discipline by attending the adult trauma clinic and by participating in operative procedures in emergent situations and on an elective basis. There is an extensive experience in management of long bone fractures, pelvic fractures, and periarticular fractures. Students are given responsibility according to their experience. There are three teaching conferences each day reviewing the previous trauma cases which came in the night before.

### ADVANCED CLINICAL CLERKSHIP IN ORTHOPAEDIC ONCOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Orthopaedic Oncology – JHH

Course Director: Dr. Adam Levin

**Telephone Number:** Beth Hall, 410-955-8344, [bkeefe2@jhmi.edu](mailto:bkeefe2@jhmi.edu)

**Faculty:** Drs. Carol Morris and Adam Levin

**Availability/Duration:** One position at a time; four weeks

**Prerequisite(s):** Preference is given to second semester third year students and to fourth year students.

**Drop Period:** 2 months

**Description:** This elective provides an overview of the evaluation and treatment of patients with benign and malignant bone and soft tissue tumors. In addition, metastatic disease to the skeleton is addressed. The student will participate in clinic and operative settings as well as following the inpatients after surgery.

## PEDIATRIC ORTHOPAEDICS

**Course Type:** Clinical Clerkship  
**Department/Division:** Orthopaedic Surgery  
**Course Director:** Dr. Paul Sponseller  
**Telephone Number:** Beth Hall, 410-955-8344  
**Faculty:** Drs. Sponseller, Ranjit Varghese, Jay Lee, and Erin Honcharuk  
**Availability/Duration:** One position at a time; 4 weeks  
**Prerequisite(s):** Core Clerkship in Surgery  
**Drop Period:** 1 month

**Description:** This is a clinical course in pediatric orthopaedics. The participant is exposed to different aspects of this discipline by attending the General Pediatric Orthopaedic, Birth Defect, Cerebral Palsy, Comprehensive Child Care and Scoliosis Clinics and by participating in operative procedures on children. There is extensive experience in pediatric sports medicine. Students are given responsibility according to their experience. There are three teaching conferences per week. "Team spirit" pervades. General and case specific reading is guided by the attendings and residents.

## POGGI PEDIATRIC ORTHOPAEDIC PROGRAM

**Course Type:** Research Clerkship  
**Department/Division:** Orthopaedic Surgery  
**Course Director:** Dr. Paul Sponseller,  
**Telephone Number:** Kenya Harris, 410-955-3137  
**Faculty:** Drs. Paul Sponseller, R. Jay Lee, Ranjit Varghese and John Tis  
**Availability/Duration:** 1 year/ One student is selected yearly to complete the Poggi Pediatric Orthopaedic Program. The student must apply to the program, interview and be selected by the interview committee.  
**Prerequisite(s):** 2–3-year medical school completed in good standing, completion of USMLE Step1  
Approval by the course directors is required to enroll in this course.  
**Drop Period:** 2 months

**Description:** A yearlong medical student clinical and research preceptorship. Responsibilities included designing and completing medical research, data analysis, writing research manuscripts, seeing patients in the outpatient and inpatient clinical setting as well as in the operating room, submitting manuscripts for publication and presenting research at national meetings.

## PEDIATRIC ORTHOPAEDIC SURGERY

### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Subinternship  
**Department/Division:** Orthopaedic Surgery  
**Course Director:** Dr. Paul Sponseller  
**Contact:** Beth Hall, 410-955-8344, [bkeefe2@jhmi.edu](mailto:bkeefe2@jhmi.edu)  
**Faculty:** Drs. Sponseller, Ranjit Varghese, Jay Lee, and Erin Honcharuk  
**Availability/Duration:** All year; 3 weeks or 4½ weeks  
**Prerequisite(s):** Core Clerkships in Surgery and Pediatrics  
**Drop Period:** 1 month

**Description:** To spend time with a surgeon doing pediatric orthopaedic surgery both in a clinic situation and in the operating room. Each rotation can be tailored to each individual. Some ability to do clinical research can also be entertained.

## CLINICAL CLERKSHIP IN SHOULDER SURGERY-GREENSPRING STATION/EAST BALTIMORE

**Course Type:** Clinical Clerkship  
**Department/Division:** Orthopaedic Surgery/ Shoulder Surgery  
**Course Director:** Dr. Edward McFarland

**Telephone Number:** Beth Hall, 410-955-8344, [bkeefe2@jhmi.edu](mailto:bkeefe2@jhmi.edu)

**Faculty:** Dr. McFarland

**Availability/Duration:** August 15 to May 30, 4-8 weeks

**Prerequisite(s):** Finished 2<sup>nd</sup> year

**Drop Period:** 2 months

**Description:** This rotation is designed for the student who is considering orthopaedic residency program. The rotation involves observation and participation in the clinic and operating room. The student will be expected to see patients, to scrub in on cases and be part of the orthopaedic team. The student will also attend orthopaedic radiology rounds and hospital rounds once a week. There is opportunity to be involved in trauma call but it is not necessary. We see patients from young to old, including athletes and patients with simple or complex shoulder problems. We also evaluate injuries to other joints such as the knee, including sports injuries. If the rotation is six to eight weeks, we recommend contributing to a case report or other publishable research.

### **ADULT TRAUMA ORTHOPAEDICS**

**Course Type:** Clinical Clerkship

**Department/Division:** Orthopaedic Surgery

**Course Director:** Dr. Greg Osgood

**Contact:** Beth Hall, 410-955-8344, [bkeefe2@jhmi.edu](mailto:bkeefe2@jhmi.edu)

**Faculty:** Drs. Gregory Osgood and Babar Shafiq

**Availability/Duration:** All year; four weeks, 1 to 2 students

**Prerequisite(s):** Core Clerkships in Surgery

**Drop Period:** 1 month

**Description:** This is a clinical course in adult trauma orthopaedics. The participant is exposed to different aspects of this discipline by attending the adult trauma clinic and by participating in operative procedures in emergent situations and on an elective basis. There is an extensive experience in management of long bone fractures, pelvic fractures, and periarticular fractures. Students are given responsibility according to their experience. There are three teaching conferences each day reviewing the previous trauma cases which came in the night before.

### **EQUITABLE HEALTHCARE- A VIRTUAL CLINICAL ELECTIVE IN ORTHOPAEDIC SURGERY**

**Course Type:** Other

**Department/Division:** Orthopaedic Surgery

**Course Director:** Dr. Dawn Laporte, [dlaport1@jhmi.edu](mailto:dlaport1@jhmi.edu), Dr. Julius Kunle Oni, [joni1@jhmi.edu](mailto:joni1@jhmi.edu), and Dr. Adam Levin, [alevin25@jhmi.edu](mailto:alevin25@jhmi.edu)

**Course Coordinator:** Beth Hall, [bkeefe2@jhmi.edu](mailto:bkeefe2@jhmi.edu)

**Availability/Duration:** 2-week elective; Capacity- 6 learners; Next Course Offering to be determined.

**Prerequisite(s):** Completion of surgery core clerkship

**Drop Period:** N/A

### **ENROLLMENT LIMITED TO VISITING MEDICAL STUDENTS.**

**Description:** This course is a 2-week virtual clinical experience for students to engage in clinical and learning opportunities in the field of Orthopedic Surgery. It is designed for students who have already completed a surgery core clerkship and plan to apply into an Orthopedic Surgery residency. The course will consist of a shared, universal curriculum that will cover topics such as health disparities, global health, LGBTQIA+ health, telemedicine, palliative care, and community resources in Baltimore. The specialty-specific curriculum will explore equitable healthcare within Orthopedic Surgery through patient interviews, case presentations, departmental conferences, didactics, and team discussion, allowing students to refine their skills while networking with residents and faculty.

### **RESEARCH IN OTOLARYNGOLOGY: HEAD & NECK SURGERY**

**Course Type:** Research

**Department/Division:** Otolaryngology Head & Neck Surgery

**Course Director:** Drs. Jean Kim and Paul Fuchs

**Contact:** [pfuchs1@jhmi.edu](mailto:pfuchs1@jhmi.edu)

**Faculty:** Dr. Paul Fuchs and Otolaryngology staff

**Availability/Duration:** Year round

**Prerequisite(s):** Clinical elective in Otolaryngology

**Drop Period:** 1 month

**Description:** An advanced research elective in Otolaryngology -Head and Neck Surgery is available to students interested in hearing, balance, olfaction, head and neck cancer, and laryngeal function. Research opportunities exist in pathogenesis of sinus disease, epidemiology, physiology and development of the inner ear, instrumentation and assessment of cochlear and vestibular implants, laryngeal pathology and reconstruction, oncology and reconstructive surgery of the head and neck.

### CLINICAL CLERKSHIP IN GENERAL OTOLARYNGOLOGY- HEAD & NECK SURGERY

**Course Type:** Clinical Clerkship

**Department/Division:** Otolaryngology: Head & Neck Surgery

**Course Director:** Dr. Marietta Tan

**Contact:** Patti Thornton: [pthornta@jhmi.edu](mailto:pthornta@jhmi.edu)

**Faculty:** Otolaryngology faculty

**Availability/Duration:** JHSOM medical students: All year; ½ quarter except summer and Qtr.1 when the elective may be 2 weeks in length. Visiting Medical students are not eligible to take this elective in summer or Qtr.1 and must conform to the JHUSOM academic calendar in Qtrs. 2, 3, and 4.

**Prerequisite(s):** Transition to the Wards (TTW)

**Drop Period:** 1 month

**THIS COURSE IS DIRECTED TO 2<sup>ND</sup> AND 3<sup>RD</sup> YEAR STUDENTS WHO ARE INTERESTED IN PURSUING A POTENTIAL CAREER IN OTOLARYNGOLOGY-HEAD AND NECK SURGERY. STUDENTS MAY HAVE OR MAY NOT HAVE COMPLETED THE GENERAL SURGERY ROTATION. WE PREFER 4<sup>TH</sup> YEAR STUDENTS REGISTER FOR THE SUB-INTERN ROTATION.**

**Description:** This course introduces students to the field of otolaryngology-head and neck surgery. The student will learn the skills necessary to take an otolaryngologic history and perform a comprehensive head and neck examination. It provides a broad exposure to otolaryngologic pathology and will familiarize the student with outpatient and in-hospital otolaryngologic care.

Time is divided between the Head & Neck Service, Otology/Neurotology Service, The Facial Plastics Rhinology Service and Pediatric Otolaryngology Service. Students will participate in rounds with the resident team, inpatient care, in the operating room, and the outpatient clinic. Patients are discussed with the attending in order to arrive at an appropriate diagnosis and treatment plan. The student will assist in patient workups and follow them during the hospital stay.

### GENERAL OTOLARYNGOLOGY HEAD & NECK SURGERY CLERKSHIP AT GREATER BALTIMORE MEDICAL CENTER

**Course Type:** Clinical Clerkship

**Department/Division:** Otolaryngology: Head & Neck Surgery

**Course Director:** Dr. Mark F. Williams, [markfwilliamsmd@yahoo.com](mailto:markfwilliamsmd@yahoo.com)

**Contact:** Judy Starling, [jstarling@gbmc.org](mailto:jstarling@gbmc.org)

**Faculty:** Otolaryngology faculty

**Availability/Duration:** All year; 3 or 4 weeks.

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** This course is designed for both the student who is interested in learning about otolaryngology in general or for those students who are planning on entering the field. GBMC has an extensive history with otolaryngology and close ties with the Johns Hopkins Department of Otolaryngology. Students will work with the Johns Hopkins residents, as well as members of the full-time and part-time faculty. All aspects of otolaryngology

are practiced, including head and neck surgery, otology, rhinology/skull base, pediatric, laryngology, and facial plastics. Students will help manage the inpatients with the residents, cover cases, and spend time in the resident clinic. Numerous educational conferences at GBMC and Johns Hopkins will also be attended.

#### OTOLARYNGOLOGY HEAD & NECK SURGERY CLINICAL ROTATION-NATIONAL CAPITAL REGION

**Course Type:** Clinical Clerkship

**Department/Division:** Otolaryngology Head & Neck Surgery

**Course Director:** Dr. Shaun Desai

**Contact:** Dr. Shaun Desai [sdesai27@jhmi.edu](mailto:sdesai27@jhmi.edu); cell: (845) 787-0781; office: (301) 896-3331

**Faculty:** Shaun Desai, M.D. (Facial Plastic and Reconstructive Surgery), Wojciech Mydlarz, M.D. and Nikki Schmitt, M.D. (Head and Neck Surgical Oncology), Murugappan Ramanathan, M.D. (Sinus and Skull Base Surgery); Wade Chien, M.D. (Otology and Neurotologic Skull Base Surgery) and Clint Allen, M.D. (Laryngeal and Voice Surgery)

**Availability/Duration:** Year-round; 2- and 4-week rotations available

**Prerequisite(s):** Third- and fourth-year medical students

**Drop Period:** 1 month prior

**Description:** This rotation is a unique tour of all aspects of Otolaryngology/Head and Neck Surgery including Facial Plastic and Reconstructive Surgery, Head and Neck Cancer, Sinus and Skull Base Surgery, Neurotology/Ear Surgery as well as Laryngeal/Voice Surgery. Students will have the opportunity to have exposure to all sub-specialties of Otolaryngology and have the flexibility to focus on certain aspects depending on level of interest. Benefits include near one-on-one mentoring opportunities with attending full-time Otolaryngology faculty. Students will have hands-on experience both in the clinic and in the operating room setting. This rotation would take place in the Bethesda/Washington, D.C. site.

#### ADVANCED CLINICAL ELECTIVE IN GENERAL OTOLARYNGOLOGY- HEAD & NECK SURGERY

##### **APPROVED SUB-I EXPERIENCE**

**Course Type:** Clinical Clerkship

**Department/Division:** Otolaryngology: Head & Neck Surgery

**Course Director:** Dr. Marietta Tan

**Contact:** Patti Thornton: [pthornto@jhmi.edu](mailto:pthornto@jhmi.edu)

**Faculty:** Otolaryngology faculty

**Availability/Duration:** All year; four weeks. Available at either the Johns Hopkins Hospital or at the Johns Hopkins Bayview Medical Center; visiting students must conform to the JHUSOM academic calendar.

**Prerequisite(s):** General Surgery rotation

**Drop Period:** 1 month

**Description:** Clerkships in general clinical otolaryngology are offered in addition to more specialized clerkships in otology, neuro-otology, clinical audiology and speech pathology, endoscopy, pediatrics, plastic surgery, and the management of head and neck tumors. These clerkships provide experience in the various diagnostic procedures related to the specialty as well as experience in the medical and surgical management of patients. Preference given to senior students who are at the beginning of the year in which they are applying to residency in Otolaryngology-Head & Neck Surgery.

#### EQUITABLE HEALTHCARE- A VIRTUAL CLINICAL ELECTIVE IN OTOLARYNGOLOGY- HEAD & NECK SURGERY

**Course Type:** Other

**Department/Division:** Otolaryngology- Head & Neck Surgery

**Course Director:** Dr. Bryan Ward, [ward15@jhmi.edu](mailto:ward15@jhmi.edu), and Dr. Carrie Nieman, [cnieman1@jhmi.edu](mailto:cnieman1@jhmi.edu)

**Faculty:** Dr. Deepa Galaiya, Dr. Alexander Hillel, Dr. Bryan Ward, and Dr. Carrie Nieman

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** N/A

**ENROLLMENT LIMITED TO VISITING MEDICAL STUDENTS.**

**Description:** This virtual 2-week elective course (80 hours total) explores key aspects in the care of diverse patient populations. The curriculum consists of a combination of virtual synchronous and asynchronous sessions. Students will engage in a universal curriculum as well as an Otolaryngology-Head and Neck Surgery curriculum based on their acceptance by director approval. A universal curriculum hosted in the afternoons will cover topics such as health disparities, global health, LGBTQIA+ health, telemedicine, palliative care, and community resources in Baltimore. The morning Otolaryngology-Head and Neck Surgery curriculum will explore equitable healthcare within that specialty through patient interviews, case presentations, and team discussion, allowing students to refine their skills while networking with residents and faculty.

**Course Objectives:** -Review key diagnoses, important exams, and management of diseases in Otolaryngology-Head and Neck Surgery  
-Practice and refine case presentations and teaching skills in Otolaryngology-Head and Neck Surgery  
-Explore how social and health disparities affect diverse populations and how to address these in a clinical setting  
-Learn principles regarding equitable healthcare as it pertains to our unique Baltimore patient population

### **PLASTIC, RECONSTRUCTIVE & MAXILLOFACIAL SURGERY**

**Course Type:** Clinical Clerkship  
**Department/Division:** Plastic, Reconstructive and Maxillofacial Surgery  
**Course Director:** Dr. Robin Yang, [ryang14@jhmi.edu](mailto:ryang14@jhmi.edu)  
**Telephone Number:** 410-502-7381  
**Faculty:** Dr. Robin Yang  
**Availability/Duration:** One week  
**Prerequisite(s):** Core Clerkship in Surgery required  
**Drop Period:** 1 month

**Description:** Rotations at Hopkins or Bayview units provide in-depth- experience with surgery and clinical care of the plastic surgery patient.

### **SUBINTERNSHIP IN PLASTIC SURGERY**

#### ***APPROVED SUB-I EXPERIENCE***

**Course Type:** Subinternship  
**Department/Division:** Plastic, Reconstructive and Maxillofacial Surgery  
**Course Director:** Dr. Robin Yang, [ryang14@jhmi.edu](mailto:ryang14@jhmi.edu)  
**Telephone Number:** 410-502-7381  
**Faculty:** Richard Redett, MD (Chairman), Scott Lifchez, MD (Residency Program Director), Robin Yang, MD, DDS (Medical Student Director)  
**Availability/Duration:** 4 weeks  
**Prerequisite(s):** Core Clerkship in Surgery  
**Drop Period:** 2 months

**Description:** This elective provides broad experience in all aspects of plastic surgery, stressing basic techniques and wound care. The student participates in the formal educational activities of the Department of Plastic Surgery. The elective will provide 2-3 weeks of training at JHH and 1- 2 weeks at Johns Hopkins Bayview.

### **EQUITABLE HEALTHCARE- A VIRTUAL CLINICAL ELECTIVE IN PLASTIC SURGERY**

**Course Type:** Other  
**Department/Division:** Plastic, Reconstructive and Maxillofacial Surgery  
**Course Director:** Dr. Robin Yang, [ryang14@jhmi.edu](mailto:ryang14@jhmi.edu), Dr. Scott David Lifchez, [slifche1@jhmi.edu](mailto:slifche1@jhmi.edu), and Dr. Kristen Parker Broderick, [kbroder4@jhmi.edu](mailto:kbroder4@jhmi.edu)  
**Availability/Duration:** 2-week elective; Capacity- 4 learners; Next Course Offering to be determined.  
**Prerequisite(s):** Completion of surgery core clerkship  
**Drop Period:** N/A

**ENROLLMENT LIMITED TO VISITING MEDICAL STUDENTS.**



**Description:** This course is a 2-week virtual clinical experience for students to engage in clinical and learning opportunities in the field of Plastic Surgery. It is designed for students who have already completed a Plastic Surgery core clerkship and plan to apply into a Plastic Surgery residency. The course will consist of a shared, universal curriculum that will cover topics such as health disparities, global health, LGBTQIA+ health, telemedicine, palliative care, and community resources in Baltimore. The specialty-specific curriculum will explore equitable healthcare within Plastic Surgery through patient interviews, case presentations, departmental conferences, didactics, and team discussion, allowing students to refine their skills while networking with residents and faculty.

### CLINICAL CLERKSHIP IN THE SURGERY INTENSIVE CARE UNIT

#### *SITE FOR ADVANCED CLERKSHIP IN CRITICAL CARE/ICU*

**Cross-listed under Anesthesiology**

### SUBINTERNSHIP IN UROLOGY

#### *APPROVED SUB-I EXPERIENCE*

**Course Type:** Subinternship

Department/Division: Urology

**Course Director:** Dr. Amin Herati

**Telephone Number:** Zena Godfrey, 410-955-4494

**Faculty:** Dr. Alan Partin and staff

**Availability/Duration:** All year; ½ quarter; visiting medical students must contact Visiting Medical Student Office for application and follow JHUSOM quarter dates.

**Prerequisite(s):** Core Clerkship in Surgery

Drop Period: 2 months

**Description:** This course provides an intense experience in Clinical Urology and Genitourinary Surgery. Working with the team, the student participates in the diagnosis, medical or surgical management and post-operative care. The large number of patients seen on the pediatric and adult urology service will provide exposure to medical problems, including renal physiology, electrolyte balance, urinary infections, urologic oncology, men's health, BPH, lower urinary tract symptoms, infertility, erectile dysfunction, urinary incontinence, and urethral stricture disease.

### RESEARCH OPPORTUNITIES

DR. FIZAN ABDULLAH

Pulmonary tissue engineering and pediatric surgical outcomes research

DR. NITA AHUJA

Colon and breast cancer carcinogenesis; biomarkers; epigenetics; surgical outcomes; disparity research cancer

DR. RICHARD BATTAFARANO

Clinical studies in lung and esophageal cancer; robotics in thoracic surgery; studies in geriatric thoracic surgery; case reports

DR. WILLIAM BAUMGARTNER

Heart/Lung transplantation and cardiac physiology

DR. MALCOLM BROCK

Translational research in biomarkers for early detection; recurrence and prognosis of thoracic malignancies

DR. ALAN DACKIW

Clinical outcomes in endocrine surgery; endocrine tumor (thyroid, adrenal) carcinogenesis

DR. SUSAN GEARHART



Anorectal cancer outcomes; surgery for IBD +/- dysplasia

DR. JOHN HARMON

Wound healing; esophageal cancer

DR. LISA JACOBS

Breast cancer clinical trials in surgical outcomes and quality of life

DR. HENRY LAU

Genetic engineering approaches to pancreatic islet cell transplantation

DR. PAMELA LIPSETT

Clinical trials in surgical intensive care; surgical infection; education and outcomes

DR. THOMAS MAGNUSEN

Clinical outcomes in bariatric surgery

DR. MARTIN MAKARY

Public health aspects of surgery

DR. MAHMOUD MALAS

Endovascular and minimally invasive vascular outcome analysis and devices development

DR. MICHAEL MAROHN

Surgical robotics; smart instruments; transluminal surgery; telesurgery; laparoscopic foregut; bariatric, colorectal, and solid organ surgery

DR. BRUCE PERLER

Outcomes analysis in vascular disease

DR. MICHAEL SCHWEITZER

Clinical studies in obesity; metabolism and clinical outcomes

DR. DORRY SEGEV

Outcomes research and large-scale data analysis in transplantation

DR. KIMBERLY STEELE

Clinical studies in obesity; metabolism and clinical outcomes

DR. CHRISTOPHER WOLFGANG

Biology of pancreatic cancer

## **NEUROLOGICAL SURGERY**

DR. STAN ANDERSON

Computational modeling and microelectrode recordings for studying seizure dynamics and new techniques in neuromodulation

DR. ALAN BELZBERG

Mechanisms of neuropathic pain; peripheral nerve outcome studies; animal model of neuroma

DR. CHETAN BETTEGOWDA

Microbiology of brain tumors

DR. HENRY BREM

Brain tumor angiogenesis and drug delivery systems: novel therapies for brain tumors and immunological approaches to brain tumors; microchip delivery systems to the brain

DR. ALI BYDON  
Spinal biomechanics

DR. MICHAEL CATERINA  
Molecular and physiological mechanisms of pain in health and disease

DR. GARY GALLIA  
Molecular biology of brain tumors

DR. JUDY HUANG  
Cerebrovascular diseases; intracerebral hemorrhage

DR. ERIC JACKSON  
Pediatric neurosurgery; treatment of infant brain tumors

DR. GEORGE JALLO  
Pediatric Neurosurgery and spinal cord tumors

DR. FRED LENZ  
Neurophysiology of movement disorders and pain

DR. MICHAEL LIM  
Immunobiology of brain tumors

DR. CHANG-CHIA (JEFF) LIU  
Brain mechanisms of pain perception and regulation in humans

DR. GREGORY RIGGINS  
Brain cancer genomics; molecular biology and drug development

DR. MATTHIAS RINGKAMP  
Pain research

DR. DODY ROBINSON  
Perinatal brain injury

DR. DANIEL SCIUBBA  
Spine tumor animal models; spine tumor outcomes; spinal deformity outcomes

DR. RAFAEL TAMARGO  
Post-hemorrhagic vasospasm; immune responses in the brain, stroke; history of neurosurgery

DR. NICHOLAS THEODORE  
Spinal cord pathophysiology; genetics of spinal disorders; personalized medicine in spinal surgery; robotics and advanced technologies in spinal surgery.

MS. BETTY TYLER  
Brain tumor laboratory research

DR. JON WEINGART  
Brain tumor research: clinical and laboratory

DR. TIMOTHY WITHAM  
Spinal disorders; outcomes research

## OTOLARYNGOLOGY - HEAD & NECK SURGERY

DR. YURI AGRAWAL

Vestibular function and aging; implications for gait and falls; vestibular compensation; vestibular rehabilitation

DR. LEE AKST

Voice and swallowing disorders; dysphonia evaluation in various populations

DR. SIMON BEST

Immunobiology of Recurrent Respiratory Papillomatosis (RRP); Development of novel therapeutic treatments for RRP

DR. NASIR BHATTI

Difficult airways; complementary and alternative medicine

DR. KOFI BOAHENE

Outcomes in facial paralysis restoration; Tissue engineering and wound healing; Minimally invasive approaches to brain and skull base lesions; Outcomes in ethnic facial cosmetic surgery; Facial paralysis; Cleft lip repair; Tissue engineering; Wound healing; Keloids

DR. EMILY BOSS

Patient and family experience of care, provider-family communication, healthcare disparities, and surgical healthcare quality and utilization

DR. MARIANA BRAIT

Cancer Biomarkers; Early Detection of Cancer; Circulating DNA; Head and Neck Cancer; Translational Cancer Research; Epigenetics; Genetics; Salivary Gland Tumors

DR. PATRICK BYRNE

Facial nerve rehabilitation; telemedicine and international cleft palate care; outcomes in reconstructive surgery

DR. WADE CHIEN

Atraumatic methodologies for cochlear implant insertion; Hearing protection/regeneration; Middle ear mechanics; Temporal bone histopathology; Musical perception in cochlear implant users

DR. CHENKAI DAI

Optimize electrical stimulation in vestibular prosthesis; adaptation and interaction of vestibular nerve system to electrical stimulation; develop new rehabilitation paradigm to improve vestibular compensation for patients with vestibular disorder; set up ECAP/VOR measurements for electrode implantation

DR. DAVID EISELE

Surgery for malignant and benign tumors of the head and neck

DR. CAROLE FAKHRY

HPV-associated head and neck squamous cell cancer

DR. GENE FRIDMAN

Applied research toward developing novel methods and devices for neural interfacing and toward developing electronic prostheses for the treatment of central and peripheral neural disorders

DR. DARIA GAYKALOVA

The whole-genome analysis of chromatin structure re-organization in primary head and neck cancer tissues with and without HPV infection and viral genome integration. The role of chromatin in the regulation of gene expression. Adaptation of epigenetic therapy for treatment of HPV+ head and neck cancer.

DR. CHRISTINE GOURIN

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SURGERY AND SURGICAL SCIENCES

Quality of life; Quality of care, safety, and decision making in head and neck cancer; Functional outcomes; Survival following treatment for head and neck cancer.

DR. ALEXANDER HILLEL

Laryngeal tissue engineering; management of the difficult airway; pathogenesis of laryngotracheal fibrosis

DR. EUGENE HUANG

Adhesion Dentistry; Biological considerations of the periodontium in regard to implant and restorative dentistry; Sjogren's Syndrome (currently involved with Sjogren's International Collaborative Clinical Alliance)

DR. LISA ISHII

Evaluation of aesthetic outcomes in facial plastic and reconstructive surgery

DR. MASARU ISHII

Objective assessment of surgical data sciences

DR. MATTHEW KASHIMA

Sleep apnea outcomes research; resident education

DR. JEAN KIM

Clinical, translational, and basic science research in chronic rhinosinusitis and nasal polyposis; immune dysfunction and upper airway epithelial cell biology; clinical, translational, and basic science research in autoimmune sinusitis and salivary gland disease.

DR. WAYNE KOCH

Translational research using molecular biology to study the head and neck neoplasms; markers for early detection, prognostication

DR. ANDREW LANE

Chronic rhinosinusitis with and without nasal polyposis, olfactory loss and transnasal endoscopic surgery. Basic science research lab utilizes molecular biologic and immunologic techniques to study human tissue and mouse models, with a focus on epithelial cell innate immunity, host-microbial interaction, and sinusitis-associated loss of smell and taste. Clinical research involves trials of novel medications and devices, as well as prospective and retrospective analyses of medical and surgical interventions.

DR. FRANK LIN

How hearing loss impacts the health and functioning of older adults and the role of different treatment modalities (hearing aids, cochlear implantation) in mitigating these effects; Examining the potential casual associations between hearing loss and dementia, cognition, functional decline, social isolation, and health economic costs

DR. SANDRA LIN

Outcomes in pediatric and adult sinusitis; outcomes in the treatment of allergies

DR. RAKSHA MIRCHANDANI

Endodontic and oral infections and their link to systemic diseases

DR. WOJCIECH MYDLARZ

Surgical and non-surgical treatment outcomes in head and neck cancer patients; Molecular biology of head and neck cancer, Clinical applications of novel targeted cancer therapies, Robotic and laser surgery and their clinical applications, Minimally invasive surgical approaches for head and neck cancer

DR. ALEXANDER PAZOKI

Oral and dental medicine

DR. MURUGAPPAN RAMANATHAN

Molecular and immunologic (innate and adaptive) mechanisms underlying the pathogenesis of chronic rhinosinusitis with nasal polyps; Role of allergy and environmental pollutants

DR. NICOLE SCHMITT

Biology of head and neck tumors, mechanisms, and toxicity profiles of platinum-based chemotherapy drugs

DR. MICHAEL SCHUBERT

Research is focused on examining the oculomotor mechanisms responsible for both behavioral outcomes and physiologic changes associated with vestibular rehabilitation. Developing novel tools to change vestibular motor behavior.

DR. DAVID SIDRANSKY

Molecular genetics of head and neck cancer; novel diagnostic approaches to detect tumors and better choose targeted therapies for cancer

DR. MARGARET SKINNER

Disorders of the pediatric airway and upper aerodigestive tract; Congenital anomalies of the larynx, trachea, and esophagus

DR. MATTHEW STEWART

Auditory Processing in Bone Anchored Hearing Aids; Healthcare quality implementation in microsystems

DR. BARRY TRINK

Molecular biology of head and neck cancer

DR. RAPLH TUFANO

Clinical and translational research of thyroid and parathyroid disease process

DR. DAVID TUNKEL

Pediatric airway problems; ear and airway disease in skeletal dysplasia; development and application of clinical practice guidelines in pediatric otolaryngology

### ORTHOPAEDIC SURGERY

DR. MICHAEL AIN

Skeletal dysplasia

DR. RONALD BYANK

General Orthopaedic Surgery

DR. DAVID COHEN

Clinical outcomes in spinal surgery; spinal deformities and disorders in adults

DR. RAJ DEU

Sports Medicine

DR. JAMES FICKE

Foot and ankle

DR. ERIK HASENBOEHLER

Trauma

DR. CASEY HUMBYRD

Foot and Ankle

DR. JACK INGARI

Hand Surgery

DR. KHALED KEBASHI  
Spine deformities

DR. HARPAL KHANUJA  
Total Joints

DR. DAWN LAPORTE  
Hand Surgery

DR. JAY LEE  
Pediatrics

Dr. ADAM LEVIN  
Oncology; primary bone tumors

DR. EDWARD MCFARLAND  
Sports medicine; shoulder and elbow conditions

DR. CAROL MORRIS  
Oncology, primary bone tumors

DR. BRIAN NEUMAN  
Spine

DR. JULIUS ONI  
Total Joints

DR. GREG OSGOOD  
Trauma

DR. LEE RILEY III  
Clinical outcomes in spinal surgery; spinal deformities and disorders in adults

DR. BABAR SHAFIQ  
Trauma

DR. PAUL SPONSELLER  
Spinal deformities; pediatric trauma; myelodysplasia; skeletal aspects of bladder exstrophy

DR. ROBERT STERLING  
Total Joints

DR. MIHO TANAKA  
Sports medicine

DR. JOHN TIS  
Pediatrics

DR. RANJIT VARGHESE  
Pediatrics

### **PLASTIC SURGERY**

DR. GERALD BRANDACHER  
Reconstructive transplantation; research strategies to induce immune tolerance and enhance nerve regeneration after hand and face transplantation

MS. CARISA COONEY, MPH

Professor Cooney leads the Department of Plastic and Reconstructive Surgery's Clinical Research Core and collaborates with faculty throughout the department and across the Hopkins enterprise. Topics include clinical vascularized composite allotransplantation (e.g., hand/face transplants), breast reconstruction, surgical education, equity in healthcare and the healthcare workforce, business of plastic surgery, burns, and more. Medical students have the opportunity to learn about, help conduct, and potentially author papers in different types of clinical/educational research. Interested individuals should email resume/CV to Prof. Cooney at ccooney3@jhmi.edu to request an interview.

DR. GEDGE ROSSON

DR. SAMI TUFFAHA

Dr. Tuffaha leads a laboratory dedicated to basic and translation research aimed at developing strategies to (1) improve peripheral nerve regeneration and functional recovery; and (2) treat and prevent painful neuroma formation. His research efforts are tightly integrated with collaborators in Biomedical Engineering and Neurology. There are additional opportunities to become involved in ongoing clinical trials that stem from work in the lab.

## UROLOGY

DR. MOHAMAD ALLAF

Minimally invasive surgery; robotics; kidney cancer; prostate cancer

DR. TRINITY BIVALACQUA

Tissue engineering and regenerative medicine of the urinary tract/penis; cancer immunology; pre-clinical models of urothelial cancer; mechanisms of BCG resistance in non-muscle invasive bladder cancer

DR. ARTHUR L. BURNETT, II

Pelvic neurophysiology; pelvic anatomy; erectile dysfunction; voiding dysfunction; pelvic reconstructive surgery

DR. WOONYOUNG CHOI

Systems biology approach on bladder cancer integrating large scale omics data (specially transcriptome data) and clinical data to understand underlying biology of bladder cancer. Development of bladder cancer classifiers, experimental therapeutics, tumor microenvironment and cancer immunology are objectives of the research.

DR. MARISA CLIFTON

Research elective in medical education, simulation, robotic simulation, neurourology, female urology, clinical outcomes.

DR. ANDREW COHEN

Outcomes research in genitourinary trauma, urethral stricture disease, or prosthetic urology. Also active projects involving fluid dynamics of urine flow, novel imaging modalities, and the microbiome. Goal is mentorship, research skill development and student first author work.

DR. HEATHER DICARLO

Bladder exstrophy-epispadias-cloacal exstrophy complex (basic science of detrusor smooth muscle physiology, intra-operative imaging guided surgery of pelvic floor); renal transplantation; GU reconstructive surgery

DR. JOHN P. GEARHART

Endocrine manifestations of ambiguous genitalia; bladder muscle nerve and collagen function in bladder exstrophy; long-term outcomes in ambiguous genitalia

DR. MISOP HAN

Oncology; outcomes research in prostate cancer; robotics in prostate cancer diagnosis and treatment

DR. JOHN ISAACS

Development of new therapies for prostatic cancer and molecular mechanisms for control of metastasis

DR. WILLIAM ISAACS

Molecular genetics of prostate cancer and benign prostatic hyperplasia; understanding molecular genetics of BRCA2 and ATM inherited prostate cancer.

DR. JUN LUO

High-throughput oriented approaches to study molecular carcinogenesis of human prostate cancer and translational research on novel prostate markers identified using these approaches

DR. SHAWN LUPOLD

Prostate cancer; microRNA biology; experimental therapeutics; high throughput library screens

DR. BRIAN MATLAGA

Kidney stone disease and surgical treatment

DR. DAVID MCCONKEY

Genomic analysis of bladder cancers, bladder cancer experimental therapeutics; molecular mechanisms controlling bladder cancer invasion, migration, and metastasis.

DR. JACEK MOSTWIN

Continence; bladder function; pelvic anatomy; medical ethics

DR. ALAN PARTIN

Prostate cancer; prostate cancer biomarker research

DR. CHRISTIAN PAVLOVICH

Minimally invasive urologic oncologic surgery; urinary biomarkers for prostate cancer and prostatic diseases

DR. KENNETH PIENTA

Cancer ecology; understanding prostate cancer metastasis; targeting tumor associated macrophages

DR. PHILLIP PIERORAZIO

Urologic oncology including renal, urothelial, prostate, and testicular tumors; specifically, runs the active surveillance program for kidney cancer and director of testicular cancer

DR. ANIRUDHA SINGH

Regenerative urology; translational tissue engineering; stem cells; biomaterials; biofabrication; polymer chemistry

DR. NIRMISH SINGLA

Clinical and translational research in urologic oncology (kidney, urothelial, testicular, prostate cancers); precision oncology; multidisciplinary treatment approaches; clinical outcomes; biomarker discovery.

DR. DAN STOIANOVICI

Urology robotics; image-guided interventions; new technologies

DR. BRUCE TROCK

Epidemiology and prevention of prostate cancer; biomarkers for aggressive prostate cancer; risk prediction for active surveillance of prostate cancer; liquid biopsy, prostate cancer outcomes and clinical trials; biostatistical approaches to prostate cancer.

DR. E. JAMES WRIGHT

Male and female voiding dysfunction; neurourology; pelvic reconstructive surgery



## OTHER

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### ELECTIVE IN INTERPROFESSIONAL PRACTICE

**Course Type:** Clinical Clerkship

**Department/Division:** JHU Schools of Medicine and Nursing and Notre Dame of Maryland University School of Pharmacy

**Course Director:** Dr. Jennifer Hayashi

**Telephone Number:** 410-955-7235; Tracey Adams

**Faculty:** Drs. Elizabeth Tanner, Brian Roland, Thomas Finucane, and Danelle Cayea

**Availability/Duration:** 9 months, 12 students per academic year. Enrollment limited to JHUSOM students.

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** This is a one-year longitudinal rotation designed to teach students the theory and practice of inter-professional practice competencies as applied to collaborative patient care for older adults. By working in teams of students from the schools of medicine, nursing and pharmacy, students will gain an in-depth understanding of the importance of inter-professional teamwork in providing safe, high-quality patient care.

**Time allocation:** The successful student will invest an average of four hours per week in the core learning activities described below:

-Inter-professional Education Seminars (70%): Each student will attend evening seminars two Wednesdays per month beginning in October. Students will learn about the distinct and complementary roles of physicians, nurses, pharmacists and other health care professionals, and the similarities and differences in their educational programs. Small group discussions led by student teams will cover inter-professional communication and collaboration skills in four simulated patient encounters during these seminar sessions. Each student will complete a final summary of the IPE experience describing four main points learned from the IPE seminar series and reflecting on individual and group professional development attributable to the course.

-Home Care Practice (30%): The student will participate in 5-6 visits to older adult clients over the course of the year, working in teams with students from each of the other disciplines as part of an inter-professional student team. Each team will collaborate to write a home visit summary describing the planning, execution, and educational outcome of each visit

**Assessment:** Pass/fail based on seminar attendance, satisfactory participation in team activities and completion of required documentation

### AUSTERE MEDICINE

**Course Type:** Other

**Course Directors:** Dr. Susan Peterson and Dr. Michael Millin

**Faculty:** Drs. Susan Peterson and Michael Millin

**Availability/Duration:** Two weeks; Not offered in AY 2021-2022; Open to 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> year students, 24-person maximum (plus 4 TA's)

**Prerequisite(s):** No experience is required; there will be a reasonable course fee associated that will not exceed \$100 that will cover the cost of the lodging, equipment, and site rental for the various locals.

**Drop Period:** Students may not drop course without permission of Drs. Peterson or Millin after the one-month deadline has passed

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** 'Austere Medicine' is the practice of medicine in a resource-constrained environment- In developing countries, in the wilderness and after a disaster.

Medicine practiced in austere environments has become increasingly popular and useful but thus far has focused on only individual areas. This course is a multidisciplinary elective that seeks to train medical students for practice

in any low-resource environment- on the wards before the team arrives, on the street, in the woods, in a developing country.

Using a universal emergency management approach (the “ABCs”) students will learn leadership, teamwork, assessment, and resuscitation skills useful in international, disaster, and wilderness medicine. A combination of lectures, simulations and complex scenarios are used daily. The classroom teaching by diverse experienced faculty will be reinforced by field time in each of the disciplines through simulation and hands on learning in a multitude of environments.

### RESEARCH IN PATIENT SAFETY AND QUALITY

**Course Type:** Basic Research

**Department/Division:** Armstrong Institute for Safety and Quality

**Course Director:** Dr. Hanan Aboumatar

**Telephone Number:** 410-637-4361

**Faculty:** Dr. Dr. Hanan Aboumatar and Armstrong Institute faculty and staff.

**Availability/Duration:** All year; limit one student at a time; 4-8 weeks

**Prerequisite(s):** N/A

**Drop Period:** 1 month

**Description:** This course provides the medical student with a primer on research methodologies and measurement related to patient safety and quality. After an orientation to theory, the student will gain exposure to application by participating in projects at the Armstrong Institute for Safety and Quality. Students will be expected to assist in the preparation of one manuscript.

Health Systems Science: Fostering future leaders for interprofessional practice

Course Type: Other

**Course Directors:** Rachel Salas, MD, MEd

**Faculty:** Bryan Hansen, PhD, RN, APRN-CNS, Email: [bhansen3@jhu.edu](mailto:bhansen3@jhu.edu); Heather Folz, PharmD, BCACP, Email: [hfolz@ndm.edu](mailto:hfolz@ndm.edu); Nicole Culhane, PharmD, FCCP, Email: [nculhane@ndm.edu](mailto:nculhane@ndm.edu)

Availability/Duration:

Prerequisite(s): None

Drop Period: one month

Enrollment limited to JHUSOM students.

**Description:** This course is designed to develop future interprofessional leaders by teaching and providing opportunities to practice collaborative strategies for health care professional students (nursing, medical, and pharmacy). Virtual seminars are designed to focus on the IPEC competencies: values and ethics, roles and responsibilities, communication, and teams and teamwork. This program will also apply strengths-based leadership development strategies for our students to facilitate the following: 1) introduce the strength-based paradigm strategy for professional development 2) celebrate the diversity of strengths amongst health professions students 3) foster a sense of community that encourages professional identity and camaraderie with other health professions students. A Strengths-Based Health Professions Workshop will be tailored to students to explore this method in their journey as a leader and a healthcare team member. This interactive program will include customized exercises, materials, and group activities developed from the Strengths Certified Coaching Teams' armamentarium. A variety of learning modalities will be used for this course including role play, case studies, a mix of in person a virtual health mentor visits and didactic seminars by experts in the field. Nursing, medical, and pharmacy students will routinely be asked to reflect on these experiences as they consider application to their future practice with both patients and colleagues.

### LATINO HEALTH PATHWAY: CLINICAL EXPERIENCE WITH LATINO HEALTH

**Course Type:** Other

**Course Director:** Dr. Rosalyn Stewart

**Contact:** Dr. Stewart; [rstewart@jhmi.edu](mailto:rstewart@jhmi.edu); 410-955-3613

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**Faculty:** Dr. Kathleen Page

**Availability/Duration:** Availability based on having completed pre-requisite training. This training is usually done in the month before you begin volunteering in the clinic. 2-3 afternoons over the course of 1 year, plus required training.

**Prerequisite(s):** Spanish language fluency; Esperanza Center/Cultural Competency Training Workshops.

**Drop Period:** 1 or 2 months prior to beginning of the elective.

**Description of Training, Time Commitment and Minimum Duration of Volunteering:**

Following completion of prerequisites, students will join residents and faculty at the Esperanza Center for an afternoon session under the guidance of Hopkins Med-Peds Urban Residents at the Esperanza Center with the following learning objectives in mind:

- To build skill in conducting a Spanish Language history and physical and communicating findings to a team of physicians

- To familiarize oneself with diagnosis and treatment of health issues common to Baltimore Latinos

- To understand the management of a community free clinic

- To appreciate the nuances of delivering culturally sensitive care to a heterogeneous population

Student will obtain a history, do a problem-oriented physical, and present the patient to the preceptor.

Therapeutic options will be discussed. The preceptor will then see the patient with the student to verify the diagnosis and treatment. Student will present 1 patient case at monthly Latino Health Pathway group meetings.

Student will attend special activities such as guest speakers hosted by Center SOL. The training will feature topics relevant to Latino patient care, including community engagement, alternative medicine, translation issues and domestic violence, among others. Students will be evaluated on participation and fulfillment of listed requirements, professionalism, cultural competence, interpersonal skills, and knowledge.

**THE HOSPITAL**

(also listed under Neurology)

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Amit Pahwa

**Contact:** [pahwa@jhu.edu](mailto:pahwa@jhu.edu) or 410-502-1934

**Faculty:** Dr. Amit Pahwa

**Availability/Duration:** All year; two weeks. Limited to one student.

**Prerequisite(s):** None

**Drop Period:** 1 month

**Description:** As a physician, and especially an intern, you will depend on a host of providers in order to efficiently care for your patients, from nurses and social workers to pharmacists and occupational therapists. An understanding of how these staff function in the hospital can help make you a more efficient (and happy) intern. An excellent complement to the Transition to Internship course (TRIPLE), *The Hospital* is a two-week immersion in the world of non-physician patient care. You will spend one day each “walking in the shoes of” various non-physician providers, under the individual guidance of expert preceptors from each field. The disciplines included are nursing, social work; case management; hospital administration; infection control; pharmacy, and rehabilitation (PT, OT, speech pathology), home care, palliative care, respiratory therapy, nutrition, hospital administration, and infection control. A pioneering venture in interdisciplinary learning, *The Hospital* will help you become a better leader and collaborator as an intern, resident, and attending physician. Grading is pass/fail and will be determined by attendance and completion of a short essay.

**GLOBAL HEALTH LEADERSHIP PROGRAM (GHLP)- INTERNATIONAL**

**Course Type:** Other

**Department/Division:** Various (international locations)

**Course Director:** Drs. Grace Chen and Jill Edwardson

**Telephone Number:** 410-550-2787

**Faculty (U.S.):** Dr. Panagis Galiatsatos; Dr. Chris Hoffman; Dr. Henry Mosley; and Ms. Maria Truskey

**Availability/Duration:** Q 1 2, 3 & 4; Summer; Students must commit 4-6 weeks for the international portion of the elective.

**Prerequisite(s):** Completion of internal medicine clerkship AND either Core Clerkship in Surgery Women's Health (OB/GYN) or Emergency Medicine.

**Drop Period:** 2 months

#### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** The mission of the Johns Hopkins Global Health Leadership Program (GHLP) is to train future global healthcare leaders through an exchange of cultural, clinical, and educational knowledge and skills.

The program begins with pre-departure training including didactic global health topic content (mostly on-line with some in-person discussion), research preparation, ethics discussions, leadership training and clinical simulation sessions. Students will then travel abroad for a clinical elective in a supervised international site. Internships with a governmental or non-governmental organization may also be available on a case-by-case basis. Students will also complete a project while at the international site, working with public health, nursing, and other students. This project may focus on quality assurance, development of a clinical and/or educational program or a research project. Upon return to Hopkins, students will participate in a post-departure briefing. Additional information and applications can be found at:

[https://www.hopkinsmedicine.org/som/curriculum/genes\\_to\\_society/curriculum/year\\_three/ghlp.html](https://www.hopkinsmedicine.org/som/curriculum/genes_to_society/curriculum/year_three/ghlp.html).

#### GLOBAL HEALTH LEADERSHIP PROGRAM (GHLP)- MIGRANT HEALTH AND HUMAN RIGHTS (DOMESTIC)

**Course Type:** Tutorial

**Department/Division:** Pediatrics, Medicine, Gynecology and Obstetrics; Center for Public Health and Human Rights

**Course Director:** Dr. Chi Chiung Grace Chen, [cchen127@jhmi.edu](mailto:cchen127@jhmi.edu), and Dr. C. Nicholas Cuneo, [nick.cuneo@jhmi.edu](mailto:nick.cuneo@jhmi.edu)

**Telephone Number:** Dr. C. Nicholas Cuneo, 617-942-1328

**Faculty:** Dr. C. Nicholas Cuneo, Dr. Kathleen Page, and Dr. Chi Chiung Grace Chen

**Availability/Duration:** All year

**Prerequisite(s):** Transition to the Wards

**Drop Period:** 1 month

#### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** This course was developed to provide an introduction to the multidisciplinary field of migrant health and human rights. In this course, students will gain experience with medical-legal partnerships through training and participation in forensic evaluations of asylum-seekers. This experience will be coupled with readings and a hybrid of online and faculty-facilitated content to deepen their understanding of health and human rights, the impact of trauma on the life cycle, reproductive justice, and treatment for survivors of gender-based violence, and community outreach efforts to the undocumented Latinx population in Baltimore.

The course combines the following elements:

- Training and practice in conducting forensic physical and psychological evaluations for asylum seekers and drafting expert affidavits in partnership with legal advocates
- Participation in outreach efforts to the undocumented Latinx community in Baltimore through partnership with Centro SOL, the center for Salud/Health and Opportunities for Latinos at JHBMC
- Completion of online Innovating Education in Reproductive Health modules ("Advancing Equity and Justice in Sexual and Reproductive Healthcare") and review of gender-based violence case with subsequent faculty-facilitated discussion
- Completion of short OpenWHO course on migration and health and Childhood Education International course on trauma-informed care, coupled with independent readings on health and human rights
- =Interning with Tahirih Justice Center (TJC), a national organization dedicated to protecting immigrant women and girls fleeing violence (optional and will extend elective to 6 weeks, requires TJC approval)

#### PROTECTION OF HEALTH IN CONFLICT

**Course Type:** Other

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**Department/Division:** Dept. of Epidemiology, Bloomberg School of Public Health, Center for Public Health and Human Rights

**Course Director:** Leonard Rubenstein

**Contact:** Kristin Hunt, [kshunt@jhu.edu](mailto:kshunt@jhu.edu) (443-287-4739); Leonard Rubenstein, [lrubenstein@jhu.edu](mailto:lrubenstein@jhu.edu) (443 287 -8749)

**Faculty:** Leonard Rubenstein

**Availability/Duration:** Spring 2015

Drop Period: One month

**ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course involves supervised research and analysis regarding the problem of protection of health in armed conflict. Work includes qualitative research on attacks on health care in Syria, literature review on impacts of attacks on health care, and other related topics.

ONLINE

### REMOTE DIAGNOSTIC RADIOLOGY TUTORIAL

Course Type: Tutorial

Department/Division: Radiology

**Course Director:** Erin Gomez, MD; Javad Azadi, MD

**Telephone Number:** Erin Gomez- [egomez8@jhmi.edu](mailto:egomez8@jhmi.edu); Javad Azadi- [jazadi1@jhmi.edu](mailto:jazadi1@jhmi.edu)

**Faculty:** Erin Gomez, MD, Javad Azadi, MD, Donna Magid, MD, Sheila Sheth, MD, Cheng Ting Lin, MD, Elliot Fishman, MD, Pamela T. Johnson, MD, Stanley S. Siegelman, MD, Jennifer K. Son, MD, Emily Dunn, MD, Daniel Bokhari, MD, Aylin Tekes-Brady, MD, Melissa Spevak, MD, Sachin Gujar, MD, Jay Pillai, MD

**Availability/Duration:** Three-week course, offerings to be determined

**Prerequisite(s):** Pre-Clinical Training (MS1 and MS2 years)

Drop Period: One month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** The Remote Diagnostic Radiology Tutorial provides an introduction to the fundamentals of diagnostic and interventional radiology. This course starts with a foundation in basic imaging physics and an overview of how images are obtained. Students will gain practice in image interpretation and formulating a differential diagnosis based on imaging findings. Additionally, they will learn about appropriate ordering practices related to medical imaging. Interactive case sessions and quizzes will be administered throughout the course to provide exposure to radiography, ultrasound, CT, MRI, and interventional radiology. The course will provide an introduction and overview of the major radiologic subspecialties.

**Course Objectives:**

- Understand the fundamentals of imaging physics and image acquisition related to plain radiographs, fluoroscopy, ultrasound, computed tomography, magnetic resonance imaging and molecular imaging.
- Gain basic proficiency in the "language of Radiology," including commonly used descriptors and terminology.
- Learn common differential diagnoses in Fluoroscopy, Thoracic and Body Imaging, Neuroradiology, Nuclear Medicine, Musculoskeletal Imaging, Pediatric Imaging and Breast Imaging.
- Learn common differential diagnoses and basic procedures utilized in the field of Interventional Radiology.
- Learn how to use the ACR Appropriateness Criteria to select the best imaging study for a specific clinical question or scenario.
- Learn how to appropriately request medical imaging.
- Gain introductory-level experience in interpreting medical images.
- Understand the basics of artificial intelligence and its evolving role in the practice of Radiology.

### VIRTUAL SURGICAL PATHOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Pathology

**Course Director:** Dr. Marissa White

**Telephone Number:** Dr. Marissa White, 410-614-3964, [mwhite44@jhmi.edu](mailto:mwhite44@jhmi.edu)

**Faculty:** Dr. Marissa White, Dr. Marc Halushka, Dr. Liz Thompson

**Availability/Duration:** All year; ½ quarter or negotiable as arranged with course director; Visiting Medical Students accepted upon approval of course director

**Prerequisite(s):** N/A

**Drop Period:** 1 month

**Description:** Online surgical pathology student rotation for medical students who have completed the pre-clinical curriculum. This case-based rotation is designed to simulate a surgical pathology resident experience and will include remote previewing and sign-out of scanned cases multiple times per week with surgical pathology faculty and/or senior residents. Assigned reading will guide independent or group case previewing. Rotators will also be expected to attend surgical pathology meetings hosted on Zoom including pathology grand rounds, daily QA conferences, live sign-outs, and resident lectures. Rotators will be evaluated at the end of the rotation in the form of a brief 10-minute presentation on a pathology topic and a short assessment. At the end of the course students will:

- Summarize the role of a general surgical pathologist as a member of the multidisciplinary care team
- List the defining histologic features of several common pathologic entities
- Demonstrate how to determine the pathologic stage for an oncologic resection
- Describe how to approach assessing biopsy specimens

### ONLINE CLINICAL DERMATOLOGY

**Course Type:** Clinical Clerkship

**Department/Division:** Dermatology

**Course Director:** Dr. Inbal Sander, lbrauns2@jhmi.edu

**Course Coordinator:** Shanika Bennett, sbenne17@jhmi.edu

**Faculty:** Dr. Inbal Sander and TBD

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This is a two-week online dermatology rotation. The course will be structured as below.

-There is an online series of lectures for medical students curated by the American Academy of Dermatology (AAD) that students will watch at their own pace. Students must login and create a user ID. The rotation schedule below lists a recommended sequence.

-There will be medical student specific zoom lectures with Dermatology faculty/residents. They will be interactive clinical based teaching sessions and clinicopathologic correlation sessions. Use of either a smart phone or laptop with microphone capabilities is required to participate in Zoom sessions. The ability to use a camera (so we can see each other) is optional but recommended. -There will be opportunity for observation of departmental and interdepartmental/multidisciplinary clinical meetings and education sessions via zoom.

**Course Objectives:** -Review and practice using dermatologic terminology for describing morphology of skin lesions

-Increase comfort in the diagnose common dermatologic conditions

-Understand the basic treatment strategies for common dermatologic conditions

### COVID-19 TRANSLATIONAL SCIENCE ONLINE ELECTIVE

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Stephen Gould

**Faculty:** Dr. Stephen Gould, sgould@jhmi.edu

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Students will develop well-researched, concise, up-to-date presentations on the various drugs being considered for trial and treatment of COVID-19 patients. Presentations will be developed for informational purposes within and beyond the JHU community.

**Course Objectives:** -Engage students in research on candidate therapeutics and other key topics related to the COVID-19 pandemic.

-Generate concise (~12-15 minutes), well-researched presentations on therapeutics and other key issues related to the COVID-19 pandemic.

-Create variations of each presentation targeted to three audiences: (a) doctors & scientists, (b) nurses, administrators, and other JHU staff, and (c) the general public.

-Work with JHU public relations staff to create versions of these presentations that are suitable for online distribution

Reinforce skills that are consistent with clinical professionalism & life-long learning.

## HIGH VALUE CARE: A DEEPER DIVE

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Amit Pahwa, pahwa@jhu.edu

**Faculty:** Dr. Amit Pahwa and Dr. Andrew Parsons, ASP5C@hscmail.mcc.virginia.edu

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** Transition to the Wards

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This two-week course will build on TIME High Value Healthcare from 1<sup>st</sup> year (although it is not a prerequisite) by delving into health systems and the clinical aspect of high value care. Students will participate in an integrative, comprehensive model of high-value care applicable to future clinical practice. Combining online modules, clinical cases, textbook instruction, and journal club with a team-based innovation project, this course spans the breadth of high-value care: a 30,000-foot view of value-based healthcare policy, the role of health systems science, and the bedside clinician's practice of high-value decision-making. Students will be assigned to groups with students from University of Virginia School of Medicine to conduct Zoom journal clubs as well as a Shark Tank.

**Course Objectives:** -Describe why health systems science is an important component of health professional training, critical for successful functioning in the healthcare system

-Describe how to connect quality and safety into the healthcare cost equation

-Describe the difference between cost, charges, reimbursement, and cost to the patient

-Acknowledge the importance of balancing the benefits and harms of testing

-Demonstrate the ability to decrease a patient's financial burden from pharmaceuticals

-Propose a solution to decrease the overuse of a non-beneficial health care service

## PROFESSIONAL IDENTITY (TRANS)FORMATION: AN ART MUSEUM-BASED ELECTIVE

**Course Type:** Other

**Department/Division:** Psychiatry and Behavioral Sciences and Medicine

**Course Director:** Dr. Margaret Chisolm, mchisol1@jhmi.edu

**Faculty:** Heather Kagan MD and Bonnie Marr MD, with guest facilitation by Kaitlin Stouffer MSc, Mark Stephens MD, Paul Haidet MD, as well as museum educators Philip Yenawine, Elizabeth Benskin, and Suzy Wolffe

**Availability/Duration:** This course is available to any 3rd or 4th year JHUSOM student. Enrollment is limited to 15 students, and the course will be offered if at least 5 students enroll and if in-person teaching is permitted by JHU and the Baltimore Museum of Art, as anticipated. Course is offered second half of block VI (Feb 22- March 12, 2021).

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This highly interactive 3-week arts and humanities course will take place primarily at the Baltimore Museum of Art and other local museums, although we will engage in a few arts-based experiences in clinical settings and online. This course is about professional identity (trans)formation, and builds on what you have learned in Years 1-4 of the College Advisory Program TIME Small Group Teaching Sessions about your sense of self and professional identity, and complements what you may have experienced in the 1-week elective, "Online Art Museum Exploring Professional Identity through Art." Priority enrollment will be given to Year 4 students as what you learn here is designed to prepare you to thrive personally and professionally during your residency training and throughout your career. The course uses the Baltimore Museum of Art and other regional museums, as well as a local innovators' space (Fast Forward U) and other non-clinical settings for a combination of small group problem-solving and creating activities. Class sessions will include activities such as open-ended discussions of visual art, music, and poetry; sketching; mask-making; storytelling; and reflective writing. Each week of the course



will center on a core theme: 1) family/community, 2) work/education, and 3) self-care. No art knowledge or experience of any kind is required.

Please note: Prior to enrolling voluntarily in this elective, students will be advised that course participation includes taking part in an IRB-approved research study. Each student will be expected to submit four 750-word+ written reflections over the duration of the course (one baseline, two formative, and one summative reflection), both to assess whether course objectives were met and to answer the study's research questions.

**Course Objectives:** -Facilitate deepened student reflection on what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients)

-Facilitate student reflection on one's sense of self in relation to one's family, community, work, and education experiences

-Facilitate student reflection on how family, community, education, and work experiences offer opportunities for improving one's life satisfaction and happiness, physical and mental health, character, and virtue, meaning and purpose, and close social relationships

### THE ONLINE ART MUSEUM: EXPLORING PROFESSIONAL IDENTITY THROUGH ART

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Margaret Chisolm, [mchisol1@jhmi.edu](mailto:mchisol1@jhmi.edu)

**Faculty:** Dr. Margaret Chisolm

**Availability/Duration:** 1 week elective- 2/22/2021-2/26/2021

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course will use visual arts-based teaching methods to facilitate reflection on professional identity. The most used and best studied of these arts-based methods, Visual Thinking Strategies, was developed by former Museum of Modern Art education director, Philip Yenawine, who has graciously agreed to be one of the small group facilitators for the course. The course builds on what you have learned in the College Advisory Program TIME Small Group Teaching Sessions about your sense of self and professional identity. What you learn here will prepare you to thrive personally and professionally during your training and throughout your career. You will engage in interactive online sessions and discussions centered on activities using online collections of art. Other activities will also include music, poetry, sketching, and reflective writing. Topic will include what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients), and self-care. No art knowledge or experience of any kind is required.

**Course Objectives:** - Facilitate student reflection on what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients)

-Facilitate student reflection on the role of the arts and humanities in developing clinically relevant skills (e.g., observation, communication, clinical reasoning, empathy, appreciation of multiple perspectives, and tolerance for ambiguity)

-Facilitate student reflection on how the arts and humanities can support self-care and wellbeing.

### EXPLORING PROFESSIONAL IDENTITY THROUGH ART: AN ONLINE ART MUSEUM-BASED ELECTIVE

**Course Type:** Other

**Department/Division:** Psychiatry and Behavioral Sciences and Medicine

**Course Director:** Dr. Margaret Chisolm, [mchisol1@jhmi.edu](mailto:mchisol1@jhmi.edu)

**Faculty:** Dr. Margaret Chisolm, Dr. Heather Kagan, and Dr. Bonnie Marr with guest facilitation by Katie Stouffer and museum educator Philip Yenawine

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**Availability/Duration:** This course is available to any 2nd, 3rd, or 4th year JHUSOM student. Enrollment is limited to 15 students, and the course will be offered if at least 5 students enroll. Course will be offered 2/22/21-2/26/21 and 5/3/21-5/7/21.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

#### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** This course will use the arts and humanities to facilitate reflection on professional identity. The most used and best studied of these arts-based methods, Visual Thinking Strategies, was developed by former Museum of Modern Art education director, Philip Yenawine, who has graciously agreed to be one of the small group facilitators for the course. The course builds on what you have learned in the College Advisory Program TIME Small Group Teaching Sessions about your sense of self and professional identity. What you learn here will prepare you to thrive personally and professionally during your training and throughout your career. You will engage in interactive online sessions and discussions centered on activities using online collections of art. Other activities will also include music, poetry, sketching, and reflective writing. Topic will include what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients), and self-care. No art knowledge or experience of any kind is required.

Please note: Prior to enrolling voluntarily in this elective, students will be advised that course participation includes taking part in an IRB-approved research study (IRB00210522; Principal Investigator Margaret Chisolm MD). Each student will be expected to submit two 750-word+ written reflections over the duration of the course (one baseline and one summative reflection) and a pre- and post-course survey to assess whether course objectives were met and to answer the study's research questions.

**Course Objectives:** - Facilitate student reflection on what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients)

- Facilitate student reflection on the role of the arts and humanities in developing clinically relevant skills (e.g., observation, communication, clinical reasoning, empathy, appreciation of multiple perspectives, tolerance for ambiguity)

- Facilitate student reflection on how the arts and humanities can support self-care and wellbeing

#### VIRTUAL PATIENT ROUNDS IN NEUROLOGY

**Course Type:** Other

**Department/Division:** Neurology

**Course Director:** Dr. Rachel Salas, [rsalas3@jhmi.edu](mailto:rsalas3@jhmi.edu), Dr. Doris Leung, [leungd@kennedykrieger.org](mailto:leungd@kennedykrieger.org)

**Course Coordinator:** Bernadette Clark, [mclark44@jhmi.edu](mailto:mclark44@jhmi.edu)

**Faculty:** Dr. Rachel Salas, Dr. Doris Leung

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

#### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** This 2-week elective course explores key aspects in the care of patients with neurologic diseases through a case-based learning approach. Chart review and live presentation of real patients seen on the neurology inpatient service or outpatient clinics will be used to practice and improve clinical thinking and learn relevant concepts on conducting a neurological history and physical exam. In addition, students will learn skills on localizing lesions in the nervous system, forming a list of differential diagnosis and recommend treatment plans for common neurologic conditions. Case selection will be curated by the neurology clerkship directors to ensure a diverse representation of neurologic disorders. The "virtual rounds" will be moderated by faculty members and a series of small group sessions will be facilitated Osler Apprentices in Neurology, who will serve as peer teachers. Attendance to Neurology Grand Rounds and participation in lectures will complement this learning experience. Students will also meet one-on-one with course directors in preparation for their presentations. When appropriate, faculty and trainees from the Department of Neurology will be invited to provide subspecialty expertise. The course will be conducted entirely via virtual meetings and does not require in-person student or faculty contact. This elective can

be offered at multiple learner levels (including pre-clerkship, post-clerkship, or sub-intern). This course will prepare students for both inpatient and outpatient case management and provide experience in remote teaching for medical trainees.

- Course Objectives:**
- Review the key signs, symptoms, and examination findings in neurological disorders
  - Practice and refine case presentation and teaching skills
  - Learn principles of localization, developing a differential diagnosis, and management of neurological diseases
  - Examine implementation strategies for neuroradiological, electrophysiological, and other diagnostic modalities in neurologic disease
  - Engage the medical literature in providing evidence-based management of neurological cases

### EFFECTIVE SEARCHING FOR HIGH-QUALITY LITERATURE FOR THE PHYSICIAN SCIENTIST

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Julie Nanavati, MLS, MA, [janava1@jhmi.edu](mailto:janava1@jhmi.edu), Anne Seymour, MS, [aseymou5@jhmi.edu](mailto:aseymou5@jhmi.edu), Rachael Lebo, MLS, AHIP, [rlebo1@jhmi.edu](mailto:rlebo1@jhmi.edu)

**Availability/Duration:** 1 week elective; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course introduces online sources for finding high-quality, full-text research articles and focuses on advanced techniques to efficiently search within these sources. It also discusses evaluating the quality of websites and research articles that are found along the way. Finally, students learn about managing references using online tools such as RefWorks. There is a lab component for this course in which students explore a research topic of their choosing and develop an advanced search strategy to find high-quality literature related to their topic. Peers in the course will provide feedback for improving the search strategy in order to make it more effective.

*Note for those who have completed TTW:* TTW introduced you to tools and strategies to quickly answer clinical questions through evidence-based summaries and high-quality literature. This course builds on these skills with a focus on developing more in-depth search strategies required for research such as literature reviews or systematic reviews.

- Course Objectives:**
- Identify online sources for finding high-quality literature
  - Develop a researchable question using the PICO model
  - Apply advanced search techniques to efficiently locate relevant articles from bibliographic databases
  - Evaluate websites and research studies to ensure that they are reliable and of high-quality
  - Use RefWorks to store and manage references

### INTERNATIONAL COLLABORATION DURING A GLOBAL PANDEMIC

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Charles Wiener, [cwiener@jhmi.edu](mailto:cwiener@jhmi.edu), Dr. Jonathan Zenilman, [jzenilma@jhmi.edu](mailto:jzenilma@jhmi.edu)

**Faculty:** Dr. Charles Wiener, Dr. Jonathan Zenilman

**Availability/Duration:** 2-week elective- 3/30/2020-5/22/2020

**Prerequisite(s):** N/A

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course is an opportunity to learn about preparation, management, and patient care protocols in health facilities and health systems around the world as well as global knowledge exchange management during a global pandemic outbreak, using the COVID-19 pandemic as a real time example. As part of this course, students

will actively contribute to the global sharing of best practices and information in a rapidly changing environment. The course is primarily research based and will involve the development of knowledge transfer content and materials that can be shared with Johns Hopkins Medicine International partners around the globe.

**Course Objectives:** -Students will learn how to synthesize complex and rapidly changing clinical and hospital operations information into digestible formats accessible to hospital and health facility administrators as well as fellow clinicians

-Students will learn about information sharing channels, both formal and informal, during a global pandemic outbreak. They will learn to identify and vet reliable sources and understand how the information is operationalized into varying country and culturally relevant contexts

-Students will learn and review best practices for healthcare facility and staff management and operations during a global pandemic, including the review of hospital policies and protocols for healthcare epidemiology and infection control

### **CRITICAL APPRAISAL OF THE MEDICAL LITERATURE: EMERGING COVID-19 DATA**

**Course Type:** Other

**Department/Division:** Medicine

**Course Director:** Dr. Robert Stern, [rstern13@jhmi.edu](mailto:rstern13@jhmi.edu)

**Faculty:** Dr. Robert Stern

**Availability/Duration:** 2-week elective (20 hours per week); Next Course Offering to be determined. Medical students will receive a total of 40 hours (1 week) elective credit for this course.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course will expand on the critical appraisal and clinical epidemiology skills taught during the first year. It will consist of 90-minute small group seminars for learning and reviewing important skills, enabling students to become more savvy consumers of published medical literature. During the final week, students will present projects demonstrating mastery of the material presented in the class. I will attempt to focus on academic studies concerning COVID-19, as they are published.

**Course Objectives:** -Understand some of the major principles involving in quantifying uncertainty in clinical medicine

-Assess the validity of diagnostic and therapeutic trial methods.

-Understand the results of diagnostic and therapeutic studies.

-Be able to apply the results of diagnostic and therapeutic trials to individual patients

### **VIRTUAL ADVANCED ADULT HOSPITAL MEDICINE ELECTIVE**

**Course Type:** Other

**Department/Division:** Medicine

**Course Director:** Dr. Amit Pahwa, [pahwa@jhu.edu](mailto:pahwa@jhu.edu), Dr. Danelle Cayea, [dcayea1@jhmi.edu](mailto:dcayea1@jhmi.edu), Dr. Shannon Walker, [swalk42@jhmi.edu](mailto:swalk42@jhmi.edu)

**Course Coordinator:** Jennifer Weaver, [jsauer4@jhmi.edu](mailto:jsauer4@jhmi.edu)

**Faculty:** Dr. Amit Pahwa, Dr. Danelle Cayea, Dr. Shannon Walker

**Availability/Duration:** 2-week elective- offered during Qtr. 4 19-20 only

**Prerequisite(s):** Medicine Core Clerkship

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Students will participate in the care of hospitalized adult patients at Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center virtually. Students will assist the medical team with clinical reasoning through chart review, patient interview, and formulation of patient problems. Students will also assist with important transitions of care tasks such as medication reconciliation, discharge education, and communicating with

outpatient providers. Students will address patients' social determinants of health through targeted education and motivational interviewing. This course builds directly on core skills and learning objectives of the Medicine Core Clerkship and will prepare students for an Advanced Clerkship in Internal Medicine (subinternship). Students will round with teams daily via Zoom and use remaining time for other patient related tasks as described. Didactics will be offered via Zoom. Independent reading will be assigned.

**Course Objectives:** -Students will demonstrate ability to synthesize patient information, develop a differential diagnosis, determine the appropriate plan  
-Students will demonstrate knowledge of important components of transitions of care and verbal and written communication skills necessary to address these components  
-Students will demonstrate the ability to evaluate a patients' social determinants of health and apply motivational interviewing techniques when justified.  
-Students will perform medication reconciliation and assess adherence with each patient assigned to them.  
-Students will demonstrate teamwork and ability to coordinate care with the in-person medical team

### FOUNDATIONS IN MEDICAL EDUCATION: TEACHING SKILLS

**Course Type:** Clinical Clerkship

**Department/Division:** Medicine

**Course Director:** Dr. Stephen Sozio, [ssozio@jhmi.edu](mailto:ssozio@jhmi.edu), Dr. Joseph Cofrancesco, [joeco@jhmi.edu](mailto:joeco@jhmi.edu), and Dr. Rachel Levine, [rlevine@jhmi.edu](mailto:rlevine@jhmi.edu)

**Faculty:** Dr. Stephen Sozio, Dr. Joseph Cofrancesco, and Dr. Rachel Levine

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Teaching is a core skill for physicians and scientists. Competent teaching at every level of training is necessary to Advance the field of medicine and ensure high quality, compassionate health care. However, medical students and physicians rarely receive formal training in teaching. This 2-week online elective covers foundational learning principles and teaching skills that will help prepare medical students to teach at all stages of their training and future practice. This course uses a combination of synchronous and asynchronous methods. Students will engage in virtual, live discussion, reflective practice exercises, a virtual text discussion and will be responsible for preparing a 5-minute session on a teaching topic using active teaching strategies learned in the course.

**Goal:** Medical students will develop an evidence-based understanding of learning principles and practice using instructional strategies for facilitating learning.

**Course Objectives:** -List 5-6 key learning principles for adult learners  
-Describe appropriate instructional strategies for teaching in a variety of settings  
-Demonstrate core teaching skills including delivering effective and focused feedback  
-Design and facilitate a 5-minute small group teaching session that aligns specific learning objectives with meaningful teaching activities.  
-Describe 6 core domains of education work in academic medicine

### ONLINE ELECTIVE IN OPHTHALMOLOGY

**Course Type:** Other

**Department/Division:** Ophthalmology

**Course Director:** Dr. Henry Jampel, [hjampel@jhmi.edu](mailto:hjampel@jhmi.edu)

**Faculty:** Dr. Scot Bower, [kbower5@jhmi.edu](mailto:kbower5@jhmi.edu), Dr. Nicholas Mahoney, [nick.mahoney@jhmi.edu](mailto:nick.mahoney@jhmi.edu), Dr. Edward Kuwera, [ekuwera1@jhmi.edu](mailto:ekuwera1@jhmi.edu), Dr. Amanda Henderson, [ahende24@jhmi.edu](mailto:ahende24@jhmi.edu), Dr. Courtney Kraus, [ckraus6@jhmi.edu](mailto:ckraus6@jhmi.edu), Dr. Ian Pitha, [ipitha1@jhmi.edu](mailto:ipitha1@jhmi.edu)

**Availability/Duration:** 1 week elective; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

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## ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** This one-week online course will include a combination of lectures by Wilmer Faculty, small group case discussions, online material from the American Academy of Ophthalmology, lectures from top educators from across the country, and visual attendance at weekly grand rounds and rounds with the department chair.

### ETHICAL AND POLICY CHALLENGES IN THE ERA OF COVID-19: IMPLICATIONS FOR CLINICAL PRACTICE, RESEARCH AND PUBLIC HEALTH

**Course Type:** Other

**Department/Division:** Berman Institute of Bioethics

**Course Director:** Dr. Gail Geller, [ggeller@jhmi.edu](mailto:ggeller@jhmi.edu)

**Faculty:** Dr. Zack Berger, [zberger1@jhmi.edu](mailto:zberger1@jhmi.edu), Dr. Megan Collins, [mcolli36@jhmi.edu](mailto:mcolli36@jhmi.edu), Dr. Michael Erdek, [merdek@jhmi.edu](mailto:merdek@jhmi.edu), Dr. Anne Barnhill, [abarnhi1@jhu.edu](mailto:abarnhi1@jhu.edu), Dr. Ruth Faden, [rfaden@jhu.edu](mailto:rfaden@jhu.edu), Dr. Marielle Gross, [mgross23@jhmi.edu](mailto:mgross23@jhmi.edu), Dr. Alan Regenber, MBE, [alanr@jhu.edu](mailto:alanr@jhu.edu)

**Availability/Duration:** Next Course Offering to be determined, 20 hours per week, students will receive 3 weeks of elective credit for this experience.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

## ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** This research elective is being offered by the Berman Institute of Bioethics (BI). It is designed for medical students who would otherwise be doing their clinical rotations (i.e., those in year 3 or the 2<sup>nd</sup> half of year 2). Much like the Scholarly Concentrations course or the Social Medicine elective, students will conduct independent research under the guidance and mentorship of individual BI faculty. Students will have the opportunity to select from among a list of projects/topics that faculty or fellows are already working on or interested in working. Examples include:

- Rationing, and/or preparation for the possibility of rationing due to (potential) shortages of life-saving medical resources
- Balancing the trade-offs between study quality vs. time pressures in academic publication: the case of the small publication on the use of hydroxychloroquine & azithromycin
- When should social distancing end? How should we look at the costs/risks/benefits through a public health ethics lens?
- Prison policy, prison health, & COVID-19
- Healthcare needs of vulnerable groups, e.g., undocumented patients
- School closures and structural injustice
- Ethical issues related to telemedicine. Is there an inherent structural injustice that will put patients from disadvantaged backgrounds (e.g., non-English speaking, undocumented, limited phone / Wi-Fi access) at risk?
- Researching the health, social, economic, and other vulnerabilities of workers in the healthcare and public health sector, and the emergency services sector, and researching potential responses to those vulnerabilities.
- Ethical issues related to the role of genomics in the management of Covid-19 including a review of the scientific literature and a content analysis of the news and social media reports
- Ethical issues in deploying retired healthcare workers
- Several topics related to women's health:
  - Breastfeeding and infant care in setting of maternal PUI/+ status, and social distancing generally
  - Defining essential/nonessential care, especially related to reproductive surgical procedures (cancer, sterilization, abortion, infertility treatments etc.)
  - Home vs. hospital birth
  - Impact of disruption of WIC and other social services on undeserved women/children
  - Special issues in psychiatric care/substance use disorder/vulnerable populations related to social distancing etc.

Students will conduct literature and other background research, review core content with faculty, and collaborate to identify, create, and disseminate suitable research products. The products of this work can take various forms including scholarly papers, public outreach, and engagement materials: e.g., blog posts, including Q&A format;

brief videos, ideally using zoom or other simple tools, brief audio pieces, planned twitter threads, etc.; and online course syllabi.

**Course Objectives:** The objectives of this course map to two of the AAMC Competencies (Practice-Based Learning and Improvement and Interprofessional Collaboration) and two of the School of Medicine objectives (Social Context of Medicine and Lifelong Learning). In addition, horizontal strands relevant to the Culture of Medicine and Health-Systems Science core themes will be highlighted. Specific course objectives include:

Social Context of Medicine:

- Describe the current status, challenges, and controversy regarding allocation of scarce resources (such as hospital beds, ventilators) that can lead to inequities and health disparities in the care of patients with Covid-19
- Describe the ethical justifications for various public health interventions to reduce the spread of Covid-19
- Describe the potential risk of harm to healthcare providers from exposure to stress, risk, and moral distress in the midst of a crisis, and strategies that can and should be deployed to ensure that these risks are managed, to the extent possible.

Lifelong Learning:

- Apply rigorous principles and a multidisciplinary body of scientific knowledge to create a scholarly objective plan to address it.
- Present one's own scholarship and ideas in an organized and clear manner to educate or inform colleagues and the medical community
- Demonstrate a critical self-appraisal in the knowledge and practice of scholarly inquiry, as well as receive and give constructive appraisal of scholarship to/from colleagues and other healthcare professionals

### **STRUCTURED COMMUNICATION WITH PATIENT FAMILIES DURING THE COVID-19 PANDEMIC**

**Course Type:** Other

**Department/Division:** Medicine

**Course Director:** Dr. Alison E. Turnbull, [turnbull@jhmi.edu](mailto:turnbull@jhmi.edu)

**Faculty:** Dr. Sarina Sahetya, Dr. Ian Oppenheim, Dr. Bhavna Seth, Dr. Jacqueline O'Toole, and Dr. Sandra Zaeh

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** Transition to the Wards

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Due to the COVID-19 pandemic, Johns Hopkins Hospitals have instituted system-wide restrictions on all visitors, for all patients. While imperative to protecting public health, this policy is anticipated to heighten psychological distress among in-patients and their families.

The two-week course will build upon, and allow students to strengthen and practice communication skills, gain insight into the experiences of families of hospitalized patients, and directly contribute to the care of patients during a time of national emergency. This is an opportunity to exercise clinical judgement and analysis related to critical care medicine remotely.

Combining one-on-one coaching, simulation, readings, online lectures, and phone-based interactions with the families of current patients, this course will help prepare you to support patient families during both routine encounters and times of crisis.

### **TRAUMA: SEQUELAE AND THERAPEUTIC APPROACHES**

**Course Type:** Other

**Department/Division:** Psychiatry

**Course Director:** Dr. Sylvia Atdjian, [satdija1@jh.edu](mailto:satdija1@jh.edu)

**Faculty:** Dr. Sylvia Atdjian and Dr. Carol Vidal

**Availability/Duration:** 1 week elective; 4/19/21-4/23/21 and 5/24/21-5/28/21

**Prerequisite(s):** N/A

**Drop Period:** 1 month



**Description:** This course will explore the phenomenology, neurobiological substrates, and sequelae of trauma. Students will learn of the relation of childhood trauma to the leading causes of morbidity and mortality in adults; about assessment and intervention in domestic violence and community violence; and about the spectrum of trauma-related disorders. Students will also learn about trauma informed approaches to “first do no harm” and about trauma-specific therapeutic approaches.

**Course Objectives:** -Describe the varied symptomatic, syndromic, and behavioral adaptations to trauma and factors that lead to resilience

-Learn the fundamentals of assessment, triage, and intervention in domestic and community violence

-Practice trauma-informed approaches in any clinical setting

### ELECTROCARDIOGRAPHY INTERPRETATION

**Course Type:** Tutorial

**Department/Division:** Medicine

**Course Director:** Dr. Brent G. Petty, [bgp@jhmi.edu](mailto:bgp@jhmi.edu)

**Faculty:** Dr. Brent G. Petty and Dr. Ronald Berger

**Availability/Duration:** 1 week elective; next course offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course is about interpreting EKG’s and builds on what students have learned in Years 2 and 3. What you learn here will prepare you for any clinical care that relies on EKGs in some way, including inpatient, outpatient, and consultant care. The course uses a combination of lecture, readings, small group sessions, literature review, and practice tracings.

**Course Objectives:** -List the five elements of EKG interpretation

-Describe the EKG evolution of an ST-elevation MI

-State the common EKG feature of second- and third-degree AV block

-Describe the distinction between right and left bundle branch block

-List the 3 crucial questions for differentiating arrhythmias.

-Read and interpret EKGs in a variety of patient presentations

### PERSON AND PANDEMIC: EXPLORING MEDICAL HUMANISM THROUGH THE ARTS

**Course Type:** Other

**Department/Division:** Medicine

**Course Director:** Dr. Colleen Christmas, [cchristm@jhmi.edu](mailto:cchristm@jhmi.edu)

**Faculty:** Dr. Colleen Christmas, Dr. Meg Chisolm, Dr. Kamna Balhara, and Dr. Mariah Robinson

**Availability/Duration:** 1 week elective; next course offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**



**Description:** This course will build upon the professional identity formation activities taught through the Colleges Advising Program TIME sessions to deepen students' exploration of the meaning of health, self, and professional identity. The instructors will utilize materials drawn from the humanities (music, poetry, literature, podcasts, movies, and visual works of art) with a particular focus on how infection, contagion, social distancing, death, and hope and belonging relate to the work of a physician. While highly relevant to students' lived experience of the ongoing pandemic, the themes we will reflect upon together are also highly applicable to the day-to-day practice of medicine. We will utilize a range of artistic and creative works to not only help students make meaning of their experiences throughout their professional career but, in so doing, guide them in developing resiliency in their careers. Each day will consist of assigned artistic works to explore asynchronously combined with 2 hours of synchronous online reflections and discussion. The final day of the course will consist of students each presenting either a work of art they have selected or an original work with a discussion of the themes and values these works demonstrate. No prior artistic or creative experience is necessary.

#### **READING ABOUT PLAGUES: A LOOK-BACK AT OUTBREAKS, EPIDEMICS, AND PANDEMICS**

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Peter Rabins, [pvrabins@jhmi.edu](mailto:pvrabins@jhmi.edu)

**Faculty:** Dr. Peter Rabins

**Availability/Duration:** 2-week elective; next course offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course will use classical and contemporary writings about outbreaks, epidemics, and pandemics during the past 2000 years to understand the experience of those living through these "plagues" of infectious disease, to understand the approaches of health professionals to these epidemics, and to put the current COVID-19 epidemic in perspective. Understanding how the attitudes and experiences of the lay public and professionals have been shaped by the social and scientific context of the time in which events have occurred will prepare students for facing current and future infectious disease outbreaks, epidemics, and pandemics.

**Course Objectives:** -Use historical and contemporaneous descriptions to describe the reactions of individuals and cultures undergoing infectious disease outbreaks, epidemics, and pandemics

Use historical and contemporaneous descriptions to describe the impact that epidemics of infectious diseases have had on medical professionals in the past and present

-Use epidemiologic theory, principles, and models to formulate approaches to the current and future outbreaks, epidemics, and pandemics

-Describe the impact of stigma on disease transmission, prevention, and control and identify strategies to address stigma

#### **MEDICAL SPANISH ELECTIVE**

**Course Type:** Other

**Department/Division:** Internal Medicine and Pediatrics

**Course Director:** Dr. Angela Orozco, [aozozco1@jhmi.edu](mailto:aozozco1@jhmi.edu)

**Faculty:** Dr. Angela Orozco and Dr. Colleen Christmas, [cchristm@jhmi.edu](mailto:cchristm@jhmi.edu)

**Availability/Duration:** 2-week elective; next course offering to be determined.

**Prerequisite(s):** Two previous Spanish courses or equivalent

**Drop Period:** 1 month

**ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This two-week elective course is designed to help medical students with previous Spanish exposure improve upon comprehension, pronunciation, grammar, and medical vocabulary. The course will be taken remotely via an online medical Spanish training platform complemented with interactive Zoom sessions. Small group role-play will be incorporated to practice patient case scenarios as well as large group discussions to explore themes related to the course, such as the variation in cultural beliefs and practices among Spanish-speaking populations.

**Course Objectives:** -Improve upon basic Spanish pronunciation, grammar, vocabulary, and comprehension  
-Understand basic medical Spanish vocabulary regarding common health concerns  
-Develop a better understanding of the variation in socio-cultural beliefs and practices among Spanish-speaking populations  
-Improve rapport-building skills with Spanish-speaking patients  
-Understand the importance of language-concordant healthcare, whether through a certified bilingual provider of interpreter, as standard of care

**EATING DISORDERS: AN INTRODUCTION TO CARE AND TREATMENT**

**Course Type:** Other

**Department/Division:** Psychiatry and Behavioral Sciences

**Course Director:** Dr. Jennifer Goetz, [jgoetz@jhmi.edu](mailto:jgoetz@jhmi.edu)

**Faculty:** Dr. Jennifer Goetz

**Availability/Duration:** 1 week elective; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

**ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course will introduce students to the epidemiology, clinical presentation, clinical work-up, diagnosis, and treatment approach to patients with various eating disorders including anorexia and bulimia nervosa and binge eating disorders. The course will integrate both psychiatric and medical knowledge and complement clinical and didactic experiences across both fields.

The course will include a combination of both didactic presentations, case-based assessment, and individual study time. There will be several readings to introduce you to the biological, psychological, social, epidemiological, and medical aspects of eating disorders. There will be a case-based assignment to work through which will be used as an assessment tool for grading (pass/fail) in the course. The case will be worked through together as a class (via teleconference) once it has been completed individually by each student. Participation in this part of the course will be a part of the grading process. There will also be a short quiz at the end of the course which will require at least a 70% to pass.

**Course Objectives:** -Describe the signs and symptoms of anorexia nervosa, bulimia nervosa and binge eating disorder  
-Identify common medical complications of anorexia nervosa, bulimia nervosa and binge eating disorder as well as recommended monitoring and treatment  
-Identify psychiatric comorbidities associated with anorexia and bulimia nervosa and binge eating disorder  
-Facilitate understanding of the refeeding syndrome and identify strategies to decrease its occurrence in the treatment of anorexia nervosa and malnourished states associated with other eating disorders  
-Identify appropriate therapeutic interventions for each of the eating disorders  
-Formulate a treatment plan for patients presenting with anorexia or bulimia nervosa in an outpatient general medical practice

## VIRTUAL PEDIATRICS

**Course Type:** Other

**Department/Division:** Pediatrics

**Course Director:** Dr. Chris Golden, [cgolden@jhmi.edu](mailto:cgolden@jhmi.edu), and Dr. Amit Pahwa, [pahwa@jhu.edu](mailto:pahwa@jhu.edu)

**Faculty:** Dr. Eric Balighian, Dr. Joann Bodurtha, Dr. Ned Bartlett, Dr. Stacey Cooper, Dr. David Cooke, Dr. Bob Dudas, Dr. Joan Dunlop, Dr. Justin Jeffers, Dr. Alexander Hoon Jr., Dr. Arik Marcell, Dr. Eric Rubin, Dr. Brittany Schwarz, Dr. Jennifer Son, and Dr. Reid Thompson

**Availability/Duration:** 2-week elective; next course offering to be determined.

**Prerequisite(s):** Transition to the Wards

**Drop Period:** 1 month

### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** During this elective, students will learn about the care of pediatric patients through on-line coursework, didactics (in pediatric medicine and pediatric radiology), clinical reasoning exercises, virtual interviews, and oral presentations. Students will gain a better understanding of routine pediatric development, common medical problems across all ages, and strategies for evaluating children and working with families.

**Course Objectives:** -Demonstrate ability to conduct patient interviews based on the age of the patient  
-Prepare and present age-appropriate, oral presentations on pediatric patients  
-Describe developmental pediatrics across the age continuum  
-Evaluate a chief concern in a patient based on the age  
-Choose and justify the necessary components of a history, physical exam, labs, and imaging to formulate an appropriate differential diagnosis

## BUILDING EMPATHY: A CROSS-SPECIALTY ELECTIVE

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Elizabeth Ryznar, [eryznar1@jh.edu](mailto:eryznar1@jh.edu)

**Faculty:** Dr. Elizabeth Ryznar

**Availability/Duration:** 1 week elective; 1 week elective; 06/28/21-07/02/21, 07/12/21-07/16/21, and 10/25/21-10/29/21. Course meets 3-5pm daily (and 8:30-9am on Monday). However, the offering will be cancelled if there are fewer than three (3) students enrolled per session.

**Prerequisite(s):** No formal prerequisite required, experience on the clinical clerkships is preferred.

**Drop Period:** 1 month

### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** Empathy has been shown to improve patient outcomes and physician satisfaction, and it is considered an essential trait of being an excellent physician. However, it is rarely explicitly taught as a concept and teachable skill. This new one-week elective will focus on developing students' empathy in medicine, emphasizing perspective-taking and mindful listening. The elective will utilize a variety of sources (like medical journal articles, narrative essays, and videos) to prepare students for perspective-taking exercises, which will be in the form of reflective written response and live zoom role-plays. The course builds on concepts covered in TIME and TTW, and it will cover a diverse range of clinical experiences. Examples of scenarios or diagnoses that may be covered include: medication non-adherence in primary care setting, receiving a cancer diagnosis, delusional parasitosis, functional neurological disorder, borderline personality disorder, and addiction. Students will be asked to discuss their own clinical experiences as well, and there will be a final paper based on a book of the student's own choosing. In this way, the elective allows for personalization of content to reflect each individual student's interests, while at the same time teaching fundamental principles and skills that are relevant to all medical students.

**Course Objectives:** -Define empathy and its modulating factors  
-Appreciate the beneficial effects of empathy on health outcomes

- Practice perspective-taking and mindfulness, which enhance one's own ability to empathize with patients
- Recognize factors that limit own's own ability to empathize with patients
- Reflect on past encounters with patients that may have challenged your empathic stance

### TELE CRITICAL CARE ELECTIVE ROTATION DURING THE COVID-19 PANDEMIC

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Lee Goeddel, [lgoedde1@jhu.edu](mailto:lgoedde1@jhu.edu)

**Faculty:** Dr. Lee Goeddel, Dr. Scott Stephens, Dr. Bo Kim, Dr. Jed Wolpaw, and Dr. Michael Grant

**Availability/Duration:** 2-week elective, next course offering to be determined. This is a part time course; students will receive 1 week of elective credit for this experience.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

#### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** This course is about learning the basics of critical care via telemedicine and video conferencing integrated ICU rounds. It builds on what you learned in the first two years of pathophysiology and in other clinical clerkships. This also provides an opportunity to learn about critical care specifically during the COVID-19 pandemic. What you learn here will prepare you for bedside critical care in the future and the recognition of critical illness in other patient populations outside of the ICU. The course is primarily driven by clinical experience.

**Course Objectives:** -Learning systems based and problem-based organization of critical care patient data gathering and reporting

-Recognition and Management hypoxic respiratory failure

-Recognition and Management of renal dysfunction in viral induced respiratory failure

-Recognition of clinical manifestations of COVID-19 induced Critical Illness

-Participate in team based tele critical care by identifying daily patient goals by system and serving the team by ensuring checklist of all major issues has been addressed

### UNSTRUCTURED DATA MINING TO ADDRESS NOVEL INFECTIOUS DISEASES

**Course Type:** Other

**Department/Division:** Health Sciences Informatics

**Course Director:** Dr. Ashwini Davison, [ashdavison@jhmi.edu](mailto:ashdavison@jhmi.edu), Dr Stuart Ray, [sray@jhmi.edu](mailto:sray@jhmi.edu), Dr. Paul Nagy, [pnagy2@jhmi.edu](mailto:pnagy2@jhmi.edu)

**Faculty:** Dr. Ashwini Davison, Dr. Stuart Ray, Dr. Paul Nagy, and Dr. Brian Garibaldi

**Availability/Duration:** 2-, 3-, or 4-week elective based on agreement with course director. Course can begin on/after 04/27/2020.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

#### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** This research elective is intended for medical students with an interest in the applications of natural language processing (NLP) techniques in addressing novel infectious disease outbreaks. During the era of big data in healthcare, there has been no greater catalyst for the importance of health informatics than the COVID-19 global pandemic. Students who are eager to derive insights from unstructured clinical data that can be used to better inform clinical decision making, contact tracing, containment and mitigation efforts will benefit from this opportunity. Faculty with expertise in pulmonology, infectious disease, radiological imaging, and clinical informatics will introduce students to the newly established COVID-19 Clinical Registry. Students will have an opportunity to perform chart abstraction and unstructured data annotation. They will work alongside clinical researchers, data analysts, and text mining experts to gain experience in the real-world application of creating supervised training sets for machine learning algorithms.

- Course Objectives:** -Describe at least 3 different techniques to standardizing data collection from chart extraction from unstructured clinical data
- Learn how to use the electronic data capture system Redcap and the natural clinical corpus tool Pine.
  - Perform chart abstraction and annotation of free text data from electronic health records.
  - Develop curated datasets for natural language processing

### FOUNDATIONS OF CLINICAL REASONING

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Susrutha Kotwal, [skotwal1@jhmi.edu](mailto:skotwal1@jhmi.edu)

**Faculty:** Dr. Roy Ziegelstein, Dr. Julianna Jung, Dr. Jake Valentine, Dr. Sharon Bord, Dr. Amteshwar Singh, Dr. Ishaan Gupta, Dr. Ivonne Pena, Dr. Milad Memari, and Dr. Sonal Gandhi

**Availability/Duration:** 1 week elective; next course offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Clinical reasoning involves establishing a diagnosis and developing a therapeutic plan that fits the unique circumstances and needs of the patient (McBee et al., 2018).

The goal of the curriculum is to formally introduce medical students at JHUSOM to current concepts in clinical reasoning, diagnostic error, and to provide an opportunity to practice clinical-problem solving in a safe, learner-centered environment. Medical students currently get exposed to the concept of diagnostic reasoning during their clinical rotations, but this rotation will provide them with the ability to further explore and experiment with these concepts. Students will also discuss both appropriate ordering and interpretation of diagnostic testing. They will be provided with a framework for honing their own diagnostic reasoning skills which they will in turn be able to translate to patient care.

This course will be a 1 week online elective available for medical students. We will use a combination of online material (video lectures, readings) and online zoom clinical problem-solving sessions with faculty facilitators.

**Course Objectives:** -Define essential concepts in clinical reasoning

- Describe causes of diagnostic error
- Identify categories of cognitive bias
- Apply Bayesian reasoning to solve clinical cases
- Discuss the role of diagnostic uncertainty in clinical decision making

### INTRODUCTION TO TELEHEALTH IN ADULT AMBULATORY MEDICINE

**Course Type:** Other

**Department/Division:** Medicine

**Course Director:** Dr. Colleen Christmas, [cchristm@jhmi.edu](mailto:cchristm@jhmi.edu)

**Contact:** Iris Knox, [iknox1@jhmi.edu](mailto:iknox1@jhmi.edu)

**Faculty:** Dr. Colleen Christmas, Dr. Sharon Dlhosh, Dr. Judith Greengold, Dr. Brian Hasselfeld, Dr. Maura McGuire, and Dr. Sean Tackett

**Availability/Duration:** 1.5-week elective – next course offering to be determined, 2-week elective – next course offering to be determined.

**Prerequisite(s):** Successful completion of two Core Clerkships, including Medicine

**Drop Period:** 1 month

#### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This elective is designed to provide students with an introductory experience in telehealth in an ambulatory practice setting caring for adult patients. Students will take on an active role providing primary care to adult patients; work closely with a preceptor in Internal Medicine, Med-Peds, or Family practice. Students will also learn about technical, societal, and legal issues related to delivery of telehealth.

## VIRTUAL GERIATRIC MENTAL HEALTHCARE IN THE COMMUNITY

**Course Type:** Other

**Department/Division:** Psychiatry, Division of Geriatric Psychiatry and Neuropsychiatry

**Course Director:** Dr. Deirdre Johnston, [djohnst4@jhmi.edu](mailto:djohnst4@jhmi.edu)

**Faculty:** Dr. Deirdre Johnston and Dr. Jin Joo

**Availability/Duration:** 2-week elective; next course offering to be determined.

**Prerequisite(s):** Completion of Year 1

**Drop Period:** 1 month

### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** This course aims to familiarize students with mental health needs of elderly persons living in the community, two models of community-based geriatric mental healthcare, and the use of available communication technologies to support these patients' care during the COVID19 pandemic. It will give students an opportunity to observe interactions with patients served by geriatric mental healthcare outreach teams now using audio and realtime audiovisual communication to replace in-person visits. In addition, students will participate in weekly multi-site interdisciplinary telementoring sessions of teams providing community-based care and support to persons with dementia and their caregivers.

**Course Objectives:**

- Describe common mental health conditions among community-dwelling elderly
- Discuss common barriers to continuity of care in this population
- Illustrate the use of telecollaborative case-based mentoring of community-based dementia care teams
- Develop community-based strategies to support a person with dementia living in the community

## ADVANCED HOSPITALIZED PEDIATRICS ELECTIVE

**Course Type:** Other

**Department/Division:** Pediatrics

**Course Director:** Dr. Christopher Golden, [cgolden@jhmi.edu](mailto:cgolden@jhmi.edu), Dr. Amit Pahwa, [pahwa@jhu.edu](mailto:pahwa@jhu.edu), and Dr. Rebekah Reisig, [rebekah@jhmi.edu](mailto:rebekah@jhmi.edu)

**Faculty:** Dr. Christopher Golden, Dr. Amit Pahwa, and Dr. Rebekah Reisig

**Availability/Duration:** 2-week elective; next course offering to be determined.

**Prerequisite(s):** Core Clerkship in Pediatrics

**Drop Period:** 1 month

### ENROLLMENT LIMITED TO JHUSOM STUDENTS.

**Description:** Students will participate in the care of hospitalized pediatric patients at Johns Hopkins Children's Center. Students will assist the team with clinical reasoning through chart review, patient interview, and formulation of patient problems. Students will also assist with important transitions of care tasks such as medication reconciliation, discharge education, and communicating with outpatient providers. This course builds directly on core skills and learning objectives of the Pediatric Core Clerkship and will prepare students for the Subinternship in Hospitalized Pediatrics. Students will round with teams daily via Zoom and use remaining time for other patient related tasks as described. Didactics will be offered via Zoom.

**Course Objectives:**

- Students will demonstrate ability to synthesize patient information, develop a differential diagnosis, and determine the appropriate plan
- Students will demonstrate knowledge of important components of transitions of care and verbal and written communication skills necessary to address these components

- Students will demonstrate ability to evaluate a patients' social determinants of health and apply motivational interviewing techniques when justified
- Students will perform medication reconciliation and assess adherence with each patient assigned to them
- Students will demonstrate teamwork and ability to coordinate care with the in-person medical team

### ONLINE INTRODUCTION TO RADIATION ONCOLOGY

**Course Type:** Other

**Department/Division:** Radiation Oncology

**Course Director:** Dr. Amol Narang, [anarang2@jhmi.edu](mailto:anarang2@jhmi.edu) and Dr. Brandi Page, [bpage5@jhmi.edu](mailto:bpage5@jhmi.edu)

**Contact Information:** Joyce Schanne, [jschann1@jhmi.edu](mailto:jschann1@jhmi.edu)

**Faculty:** Multiple faculty in Radiation Oncology

**Availability/Duration:** 2-week elective- next course offering to be determined. This is a part time course; students will receive 1 week of elective credit for this experience.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** Online Introduction to Radiation Oncology will introduce students to the fundamentals of Radiation Oncology. Radiation Oncology represents one of the three main disciplines within cancer care, along with Medical Oncology and Surgery Oncology. In this course, students will first learn the basic principles of how therapeutic radiation is produced and the mechanism through which radiation damages cancer cells. Students will subsequently learn about the complex workflow that is required to accurately deliver radiation to tumors. Thereafter, disease site-specific lectures will be provided in which students will be introduced to how radiation is used for cancers across the body, including central nervous system, head, and neck, thoracic, breast, abdominal, genitourinary, gynecologic, and pediatric malignancies. Furthermore, students will have the opportunity to observe and participate in patient encounters through tele-visits through which students will gain insight into the complexities of oncologic decision-making and patient counseling. Additionally, students will be introduced to the process of contouring and treatment planning to understand how radiation treatment plans are designed. Students will also have the option to give a short presentation at the end of the rotation on the topic of their choice. As radiation therapy presents a critical treatment modality for the vast majority of cancers, this course is highly recommended for any student considering a career in any oncologic discipline, but it will also be applicable for students going into any field.

**Course Objectives:** -Learn the basic radiation physics and biology principles of radiation therapy

-Learn how radiation is incorporated into the treatment plans across a variety of tumor types

-Observe and participate in patient encounters through tele-visits to gain insight into oncologic decision-making and patient counseling

### VIRTUAL PATIENT INTERACTIVITY: PATIENT CARE- BASED EDUCATION IN UROGYNECOLOGY

**Course Type:** Other

**Department/Division:** Gynecology and Obstetrics/ Female Pelvic Medicine and Reconstructive Surgery

**Course Director:** Dr. Chi Chiung Grace Chen, [cchen127@jhmi.edu](mailto:cchen127@jhmi.edu) and Dr. Danielle Patterson, [dpatte33@jhmi.edu](mailto:dpatte33@jhmi.edu)

**Course Coordinator:** Carol Wilkinson, [cwilkin1@jhmi.edu](mailto:cwilkin1@jhmi.edu)

**Faculty:** Dr. Chi Chiung Grace Chen, Dr. Danielle Patteron, and Urogynecology fellows

**Availability/Duration:** 3-week elective; next course offering to be determined.

**Prerequisite(s):** Transition to the Wards

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This course was developed to provide a virtually interactive introduction to the subspecialty of female pelvic medicine and reconstructive surgery/ urogynecology. In this course, students will learn about the most

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common conditions seen in the urogynecology clinic. While this course will build on skills students learned during the Transitions to the Wards (TTW) course and other core clerkships including obstetrics and gynecology, previous rotation on any of the clinical clerkships, including obstetrics and gynecology, is not a prerequisite to taking this elective. The course combines the following elements:

- Required readings mostly from the American College of Obstetrics and Gynecology (ACOG) practice bulletins
- Online interactive new patient case reviews with instructions on written notes for virtual debriefing with faculty
- Electronic medical review of select past patients on EPIC and case presentation on these patients virtually to faculty
- PowerPoint presentation on urogynecologic topic of interest
- Additional in-depth readings and reviewing of surgical videos with the opportunity to virtually discuss with faculty (optional)
- Research in urogynecology topic of interest (optional)

### **MEDICAL HUMANITIES AND SOCIAL MEDICINE IN THE CONTEXT OF COVID-19**

**Course Type:** Other

**Department/Division:** Interdepartmental

**Course Director:** Dr. Carolyn Sufrin, csufrin1@jhmi.edu

**Faculty:** Dr. Joseph Carrese, Dr. Gail Geller, and Dr. Jeremy Greene

**Availability/Duration:** Part-time elective, students will receive 1 week of elective credit; Next Course Offering to be determined.

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This two-week, part-time elective explores the ways that social structures influence the practice, research, and politics of healthcare through the lens of the COVID-19 pandemic. The course is designed for medical students seeking deeper study into the relationship between medicine and its social contexts. The course will provide a structural framework in the field of medical humanities and social medicine. Students will learn how they can use these frameworks to make various aspects of clinical settings and encounters visible in different ways than the standard therapeutic goals of the clinic. Students will engage with interdisciplinary scholarly work on past pandemics and apply these concepts to the present in order to critically discuss institutional and societal issues in medicine.

Participants in the course will meet daily with course coordinators and facilitators to discuss the social implications of COVID-19 in medicine and reflect on its lessons to their developing clinical practice. Discussions will be guided by pre-assigned readings and in-session activities. By the end of the course, students can expect to have been introduced to various methods for examining the relationship between medicine and society, and to have created one's own proposal of a potential project in the subject of medical humanities and social medicine.

**Course Objectives:** -Summarize the field of medical humanities and social medicine

-Describe the role and clinical application of interdisciplinary work in medicine, particularly as it applies to medical humanities and social medicine

-Participate in discussion on themes of health inequalities, social justice, and social determinants of health in everyday practice

-Apply and present medical humanities and social medicine frameworks to a scholarly research proposal

### **PHYSICAL MEDICINE AND REHABILITATION VIRTUAL ELECTIVE**

**Course Type:** Other

**Department/Division:** Physical Medicine and Rehabilitation

**Course Director:** Dr. Tracy Friedlander, tfried1@jhmi.edu

**Faculty:** Dr. Tracy Friedlander, Dr. Sam Meyer, Dr. April Pruski, Dr. Mary Keszler, and Dr. Marlis Gonzalez-Fernandez

**Availability/Duration:** 2-week elective; next course offering to be determined.

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**Prerequisite(s):** N/A

**Drop Period:** 1 month

**Description:** This elective will offer a broad exposure to the scope of physical medicine and rehabilitation. In addition to learning about medical management of patients with disability, student will get exposure the Johns Hopkins residency program, faculty, and clinical and research opportunities in the department of PM&R. Students will have the opportunity to give presentation and share their passion for PM&R.

**Course Objectives:** -Recognize the scope of practice of Physical Medicine and Rehabilitation physicians and the interdisciplinary team

-Identify common medical conditions affecting people with disabilities and the role of Psychiatrists in improving the quality of life and function for people with disabilities

-Participate in discussions with peers and faculty about the role of PM&R in care of people with disabilities

-Devise a presentation to demonstrate comfort discussing medical and social issues that affect persons with disability

-Write a reflection about the impact of disability on medical care and personal understanding of PM&R

### EQUITABLE HEALTHCARE

**Course Type:** Other

**Department/Division:** Dermatology, Emergency Medicine, Gynecology & Obstetrics, Internal Medicine, Neurology, Ophthalmology, Otolaryngology-Head & Neck Surgery, Orthopaedic Surgery, Pediatrics, Plastic Surgery, Psychiatry, and Surgery and Surgical Sciences

**Course Director:** Varies between departments

**Availability/Duration:** 2-week elective; Next Course Offering to be determined.

**Prerequisite(s):** Varies between departments

**Drop Period:** N/A

### **ENROLLMENT LIMITED TO VISITING MEDICAL STUDENTS.**

**Description:** This virtual 2-week elective course (80 hours total) explores key aspects in the care of diverse patient populations. The curriculum consists of a combination of virtual synchronous and asynchronous sessions. Students will engage in a universal curriculum as well as a specialty-specific curriculum based on their acceptance by director approval. A universal curriculum hosted in the afternoons will cover topics such as health disparities, global health, LGBTQIA+ health, telemedicine, palliative care, and community resources in Baltimore. The morning specialty-specific curriculum will explore equitable healthcare within specific departments through patient interviews, case presentations, and team discussion, allowing students to refine their skills while networking with residents and faculty.

### PROFESSIONAL IDENTITY (TRANS)FORMATION: AN ART MUSEUM-BASED ELECTIVE

**Course Type:** Other

**Department/Division:** Psychiatry and Behavioral Sciences and Medicine

**Course Director:** Dr. Margaret Chisolm, mchisol1@jhmi.edu

**Faculty:** Heather Kagan MD and Bonnie Marr MD, with guest facilitation by Kaitlin Stouffer MSc, Mark Stephens MD, Paul Haidet MD, as well as museum educators Philip Yenawine, Elizabeth Benskin, and Suzy Wolffe

**Availability/Duration:** This course is available to any 3rd or 4th year JHUSOM student. Enrollment is limited to 15 students, and the course will be offered if at least 5 students enroll and if in-person teaching is permitted by JHU and the Baltimore Museum of Art, as anticipated. Course is offered second half of Block 6 (Feb 22- March 12, 2021).

**Prerequisite(s):** N/A

**Drop Period:** 1 month

### **ENROLLMENT LIMITED TO JHUSOM STUDENTS.**

**Description:** This highly interactive 3-week arts and humanities course will take place primarily at the Baltimore Museum of Art and other local museums, although we will engage in a few arts-based experiences in clinical settings and online. This course is about professional identity (trans)formation, and builds on what you have

learned in Years 1-4 of the College Advisory Program TIME Small Group Teaching Sessions about your sense of self and professional identity, and complements what you may have experienced in the 1-week elective, "Online Art Museum Exploring Professional Identity through Art." Priority enrollment will be given to Year 4 students as what you learn here is designed to prepare you to thrive personally and professionally during your residency training and throughout your career. The course uses the Baltimore Museum of Art and other regional museums, as well as a local innovators' space (Fast Forward U) and other non-clinical settings for a combination of small group problem-solving and creating activities. Class sessions will include activities such as open-ended discussions of visual art, music, and poetry; sketching; mask-making; storytelling; and reflective writing. Each week of the course will center on a core theme: 1) family/community, 2) work/education, and 3) self-care. No art knowledge or experience of any kind is required.

Please note: Prior to enrolling voluntarily in this elective, students will be advised that course participation includes taking part in an IRB-approved research study. Each student will be expected to submit four 750-word+ written reflections over the duration of the course (one baseline, two formative, and one summative reflection), both to assess whether course objectives were met and to answer the study's research questions.

**Course Objectives:** -Facilitate deepened student reflection on what it means to be human, to be a physician, and to lead a good life (for oneself and one's patients).

-Facilitate student reflection on one's sense of self in relation to one's family, community, work, and education experiences.

-Facilitate student reflection on how family, community, education, and work experiences offer opportunities for improving one's life satisfaction and happiness, physical and mental health, character, and virtue, meaning and purpose, and close social relationships.

-Facilitate student reflection on the role of the arts and humanities in mastering skills, appreciating multiple perspectives, gaining personal insight, and supporting social advocacy.

-Facilitate student reflection on how the arts and humanities can support self-care and wellbeing.