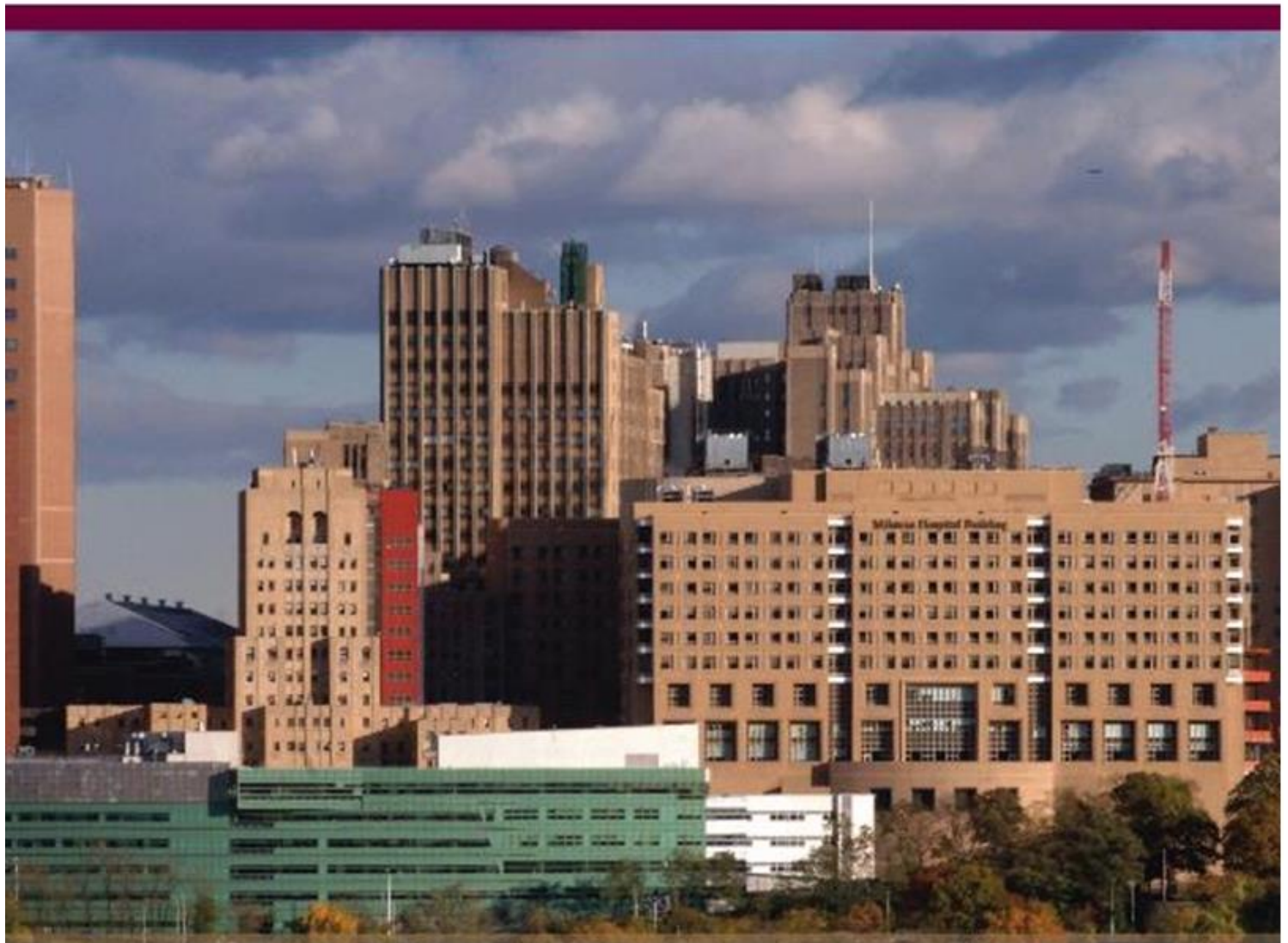COLUMBIA UNIVERSITY

College of Physicians
and Surgeons

Scholarly Projects Program

2019 - 2020

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COLUMBIA UNIVERSITY
College of Physicians and Surgeons

Scholarly Projects Program
630 West 168th Street, 3-401
New York, NY 10032
212.305.2666 Tel
212.305.1343 Fax

ps.columbia.edu

February 1, 2019

Dear Students and Faculty:

We are delighted to welcome you to the seventh year of the Scholarly Projects Program (SPP) at the College of Physicians and Surgeons! The SPP offers you the opportunity to delve in-depth into an area of medicine that interests you and to share your findings with your colleagues in our academic community.

In the SPP, you will craft an individualized medical school experience for yourself, with the ability to take advantage of the broad range of faculty whose research endeavors, clinical practices and educational programs enrich our campus. The P&S faculty has a long tradition of mentoring medical students and is looking forward to working with you. In addition, our close affiliation with the Mailman School of Public Health, the College of Dental Medicine, and the School of Nursing on the CUMC Campus, as well as Columbia University at large on the Morningside Campus, offers unparalleled resources to facilitate and guide your progress.

It is our hope that you will find that your experience in the SPP forms an important part of what will flourish into an exciting and rewarding medical career.

Sincerely,

Lee Goldman, M.D.

Dean of the Faculties of Health Sciences and Medicine

Executive Vice President for Health and Biomedical Sciences

Ronald Drusin, M.D.

Vice Dean for Education

William Bulman, M.D.

Associate Professor of Medicine

Director of the Scholarly Projects Program

Columbia University Medical Center

Aim and Rationale

The Scholarly Projects Program (SPP) links medical students with faculty mentors to explore an area of medical practice or research with the aim of creating new knowledge. We encourage students to select a project that allows for immersion with the hope that this experience will consolidate the learning developed through Fundamentals and the Major Clinical Year into an individual professional passion.

All students (except in the PhD-to-MD track) are required to complete a scholarly project, though those who complete a year of research or a second academic degree during medical school may elect to apply their dual-degree experience in fulfillment of the Scholarly Project requirement.

Learning Objectives

The SPP aims to develop students' abilities in the following School-Wide Learning Objectives: (i) generate hypotheses, exhibit curiosity and develop a pattern of life-long learning and (ii) participate in the process through which new knowledge is generated, and assess the importance of novel ideas. Specifically, in completing the SPP, students will have the opportunity to ask innovative questions, deepen their experience of medicine and contribute to the academic environment.

Preparation

The major steps of preparation for the Scholarly Project include track selection, mentor selection and development of the project proposal. In selecting a track, we encourage students to reflect on their individual experiences, interests and passions and seek consultation from potential mentors and SPP Faculty as early in their medical training as they wish.

Other preparatory work required prior to beginning the Scholarly Project depends on the topic. For example, students proposing original human subjects research must familiarize themselves with the policies and procedures of the Institutional Review Board.

All students in the SPP may meet with Dr. Bulman in advance to discuss their scholarly project goals and the tracks in which they are interested.

Subject Matter

The topic of the Scholarly Project is up to the student and should find common ground between the student's interests, abilities and career desires and those of the mentor.

In structuring a Scholarly Project, students select from six available tracks of study, each directed by a senior faculty member. The Track Directors assist students in identifying mentors, structuring project proposals and anticipating regulatory reviews including those by the Institutional Review Board. Track Directors are also responsible for approving students' projects, reviewing their progress on a regular basis and evaluating students' Capstones.

Curriculum

Students in the SPP dedicate four or more months of full-time effort on their project during Differentiation & Integration (D&I). SPP work, including the students' investigation and involvement in any track-specific didactics, may be started as early as the beginning of D&I and must be completed by the end of March prior to graduation. The requirement may be fulfilled contiguously or in divided periods.

At the conclusion of the Scholarly Project, each student is required to prepare and submit a written summary of their work, the ***Capstone***, and a poster. Submitted work is reviewed by the mentor and Track Director according to common standards.

Funding

Each student completing a scholarly project is eligible for up to $500 to defray expenses related to travel, presentation or other costs associated with the project. Students may apply for additional funding through the Sara and Arnold P. Friedman Awards program. Columbia Faculty mentors receive a stipend for their contribution upon completing the final evaluation. A foreign mentor must complete an 8BEN form using an email address so the mentor can verify their information.

Scholarly Projects "Plus"

Students who wish to engage in projects longer than four months must develop an individualized learning plan (ILP) with Dr. Bulman. Please request a meeting by opening a ticket at **psofficeofed.uservoice.com**.

☐ CHECKLIST

Late in the Major Clinical Year

This is the time to consider what specialties you may choose to investigate at greater depth in the elective portion of the curriculum. When you are ready, review the P&S Match Profile of the specialties of interest to you to gauge how important research is in the overall application. Some specialties, particularly surgical subspecialties, expect you to have spent some of your time in medical school pursuing clinical research in that discipline. Most others, though, have a remarkable degree of flexibility and view your choice of scholarly project as an expression of your academic and/or personal priorities.

- Dr. Bulman is happy to meet with you to think through your ideas – please open a ticket at **psofficeofed.uservoice.com** to start the scheduling process.

During Boards Studying or Early in D&I

This is the time to hone in on your project, including starting to think about the track in which you would like to work and potential mentors who may help you.

- Take some time to review project that P&S students have completed in the past at **psscholarlyopportunities.wikispaces.columbia.edu**.

First Month of Scholarly Project (Timing Varies)

The first month of the Scholarly Project is meant to give you protected time to seek out and finalize a project.

- You must register on OASIS at least 15 days before the first day of the month in which you plan to begin your project.
- You must submit your project proposal via CourseWorks (there is a template posted) by the midpoint of your first month.
- **Under no circumstances may you begin to collect data from human subjects until you have met both of the following requirements**: (i) your project has been approved by the Institutional Review Board and (ii) your Track Director has reviewed and approved your project proposal.
- You must begin Month 1 of your Scholarly Project by September at the latest

Months 2-4 of Scholarly Project (Timing Varies)

All students must have an approved scholarly project proposal in place to be permitted to register for additional months.

- You must register on OASIS at least 15 days before the first day of each month in which you plan to work on your project.
- After the completion of your second month of Scholarly Project, you will be asked to complete an evaluation via OASIS to let us know if you are on track.
- You must submit your Capstone project by the last day of your final scholarly project month. Your mentor should review your capstone before you submit it on Courseworks.

Scholarly Project Plus (Timing Varies)

Students wishing to extend Scholarly Projects beyond four months must meet with Dr. Bulman to develop an Individualized Learning Plan (ILP). Please request a meeting by opening a ticket at **psofficeofed.uservoice.com**.

WILLIAM BULMAN, M.D.

Dr. Bulman is an Associate Professor of Medicine at CUMC in the Division of Pulmonary, Allergy, and Critical Care, Assistant Track Director for Clinical Research and the Director of the Scholarly Projects Program.

PH8E|wab10@cumc.columbia.edu|212.305.1544

RITA CHARON, M.D. PH.D.

Dr. Charon is a Professor of Medicine at CUMC, the Director of the Program in Narrative Medicine and Track Director for Narrative and Social Medicine.

PH 9E-105 | rac5@cumc.columbia.edu | 212.305.4942

DEEPTHIMAN GOWDA, M.D. M.P.H. M.S.

Dr. Gowda is an Associate Professor of Medicine at CUMC and Track Director for Medical Education.

HH 201 | dg381@cumc.columbia.edu | 212.305.2451

UTPAL PAJVANI, M.D., PH.D.

Dr. Utpal Pajvani is an Associate Professor of Medicine in the Division of Endocrinology at Columbia University and Track Director for Basic Science.

RB 101-I | up2104@columbia.cumc.edu | 212.851.4886

NEIL SCHLUGER, M.D.

Dr. Schluger is a Professor of Medicine, Epidemiology and Environmental Health Sciences, the Chief of the Division of Pulmonary, Allergy and Critical Care Medicine and Track Director for Population Health.

*PH 8-101 | ns311@columbia.cumc..edu | 212.305.9817*

HENRY SPOTNITZ, M.D.

Dr. Spotnitz is the George H. Humphreys II Professor of Surgery and Vice Chair for Research in the Department of Surgery and Track Director for Clinical Research.

VC 1010 | hms2@cumc.columbia.edu | 212.305.6191

KARINA WINN

Karina Winn is the Scholarly Projects Program Coordinator.

VEC 1103 | kw2730@columbia.edu | 212.305.2666
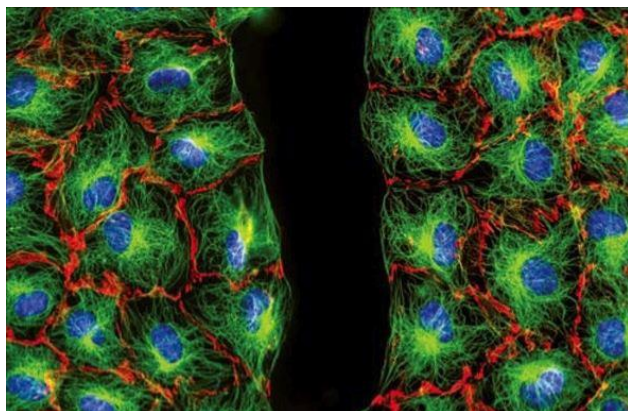
Wound healing (courtesy of Professor Gregg Gundersen)

OVERVIEW

Over a hundred federally (NIH and NSF) funded basic sciences laboratories at Columbia University are probing fundamental questions in biology, chemistry, and physics. Advances in basic science have inspired advances in medicine for centuries. Sometimes the medical benefit of discoveries is unanticipated. Few thought, for instance, that the 1857 discovery of the microbial basis of fermentation would lead to the germ theory of disease. Sometimes benefits are more immediately evident. Particle physicists in the 1950's quickly appreciated the potential of particle beams and pioneered new cancer therapies. Physicians have been an integral part of the distinguished history of basic science discovery. Dr. Michael Brown and Dr. Joseph Goldstein, Nobel laureates, physicians and discoverers of the LDL receptor, recently observed: "Ambitious young physicians juxtaposed to cutting-edge basic scientists can themselves make fundamental discoveries."

Prior contact with a laboratory will help you make the best use of your Scholarly Project time to develop interesting hypotheses, experimental approaches, and results. We encourage you to attend research seminars on campus - early and often. We also offer formal seminar opportunities (e.g. *Seminars in Research at P&S Series* and the *Medical Scholars Seminar Series)* to expose you to exciting research and to hone your scholarly questions and communication skills.

TRACK DIRECTOR

Dr. Utpal Pajvani, M.D., PH.D. Associate Professor of Medicine in the Division of Endocrinology at Columbia University, is a physician-scientist with clinical and research focus in Type 2 Diabetes and related metabolic diseases. He graduated from the Massachusetts Institute of Technology with a degree in Biology in 1996, then earned M.S. (2001), M.D. (2005) and Ph.D. (Department of Cell Biology, 2005) degrees from the Albert Einstein College of Medicine. Dr. Pajvani completed his internship and residency training and is board certified in Internal Medicine (2007) and fellowship in Endocrinology, Diabetes & Metabolism (2011), both at the Columbia University Medical Center.

Dr. Pajvani has been on the faculty of Columbia University since 2011. He is a teaching attending on the inpatient and outpatient Endocrinology and General Medicine services of the New York Presbyterian Hospital, and sees patients at the Naomi Berrie Diabetes Center at Columbia University. Dr. Pajvani's research focuses on the role of developmental pathways in the regulation of Type 2 Diabetes and Non-Alcoholic Fatty Liver Disease, and the use of existing therapeutic agents in other scientific areas in novel applications to ameliorate obesity-induced complications including cancer. He has received intramural and NIH support for his research and has mentored medical and graduate students as well as postdoctoral and clinical fellows. He will help you identify mentors and develop your research interests.

RECENT PROJECTS (2015-2016)

Disease stabilization with pembrolizumab for metastatic acral melanoma in the setting of autoimmune bullous pemphigoid

White Matter Tractography in Borderline Personality Disorder

The Role of Bile Acids on Colonization with Carbapenam-Resistant *Enterobacteriaceae* (CRE) After Liver Transplantation

Immune signatures and clinical course in schizophrenia
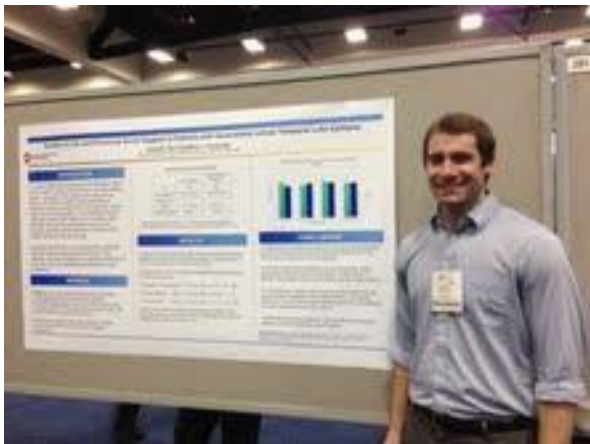
OVERVIEW

As P&S students, you may be fortunate to spend a substantial part of your professional lives in clinical research of one form or another. As potential collaborators, you are a research director's dream - creative, dedicated, brilliant, productive, and optimistic. The key to a scholarly project in clinical research is matching your interests and talents with those of a stimulating mentor. A fully formulated, original research plan is optional but not required. Most student research concepts will ultimately be modified to match the resources and funding of the mentor's research group. A leading medical center like CUMC is bursting with research opportunities on every clinical service.

TRACK DIRECTOR

Dr. Henry Spotnitz, M.D. Track Director for Clinical Research, is George H. Humphreys II Professor of Surgery, chairman of the Columbia University Medical Center Subcommittee on Conflict of Interest in Research and a member of the Columbia University Senate's Information Technology Committee.

ASSISTANT TRACK DIRECTOR

Dr. Bulman is an Associate Professor of Medicine at Columbia University Medical Center in the Division of Pulmonary, Allergy and Critical Care. He is a graduate of the University of Pennsylvania School of Medicine, and he completed internships in both surgery and medicine before residency training in Internal Medicine at Columbia. He served as Chief Resident in Medicine and later completed fellowship training in Pulmonary and Critical Care Medicine. He is the co-director of the Pulmonary Medicine section of The Body in Health and Disease.

RECENT PROJECTS (2016-2017)

Management of Surge Utilization in ECMO Transport
Characterizing Gait of Patients with Acoustic Neuroma Using Footwear-Based Gait Analysis with Action-Related Feedback
Evaluation of Blood Loss and Transfusion Rate During Primary Open Craniosynostosis Repair
Does Leptin Predict Outcome in Anorexia Nervosa?
Control of Brain Metastases in Melanoma Patients with Gamma Knife Radiosurgery and Immune Checkpoint Inhibition
Visual Field Improvement in Patients with Thyroid Eye Disease and Compressive Optic Neuropathy Treated with Radiotherapy: A Longitudinal Analysis
Genomic Alterations in Metastatic Colorectal Cancer: an Integrated Clinical and Bioinformatic Analysis
Outcomes of Breech Presentation with or without External Cephalic Version in a Large Academic United States Medical Center
The Role of Interventional Radiology in the Management of Pediatric Patients Following Living Donor Liver Transplant (LDLT): A Ten-Year Single-Institution Experience

☐ GLOBAL AND POPULATION HEALTH TRACK

OVERVIEW

The Global Health and Population Health Tracks engage students with interests that go beyond the boundaries of clinical medicine and individual patient care. Students in this track explore the range of forces—medical, social, cultural, political, economic, and legal—that have an impact of the health of populations in the United States and around the world.

One definition of public health is "the science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals." Another states that public health is "the approach to medicine that is concerned with the health of the community as a whole." Scholarly projects in population and community health will focus on issues of importance that affect health of large communities such as obesity, diabetes, asthma, tobacco use, hypertension, heart disease, tuberculosis, HIV infection, and others. At the population level, interventions to address these problems may involve medical care, but may also involve legal, social, cultural, political and economic approaches to effect changes that will improve health at the population level. Projects in this area may be designed to understand, develop and/or evaluate population-based approaches to health and well-being. Global health projects aim to understand and reduce health challenges in international settings and to cultivate deep cross-cultural understanding. These projects provide students with opportunities to learn about and experience global health directly and consider health beyond the clinical perspective.

Scholarly projects may be done in an international or domestic setting and use clinical or population-based research, professional or patient education, policy work or advocacy, humanistic or bioethical analyses, or other scholarly approaches to address infectious diseases; chronic and cardiovascular diseases; children's or women's health; mental health; population health, demography, and aging; global health delivery and health systems; technology innovation; crisis and conflict; ethical issues; or another topic of interest. Projects should preferably build upon or add to ongoing longitudinal projects (i.e., research, health interventions, educational activities) that aim to strengthen existing capacity and infrastructure on a long-term basis. Incoming students interested in doing a global health scholarly project are strongly encouraged to enroll in the Dr. Edgar Housepian Global Introduction to Global Health Lecture Series (Fall semester), the Research Methods in Global Health course (Spring semester), and to apply for a first-summer Global Health Research Internship. Advance planning of 6 months or more is recommended, as projects require local and Columbia IRB approval.

Incoming students interested in doing a global health scholarly project are strongly encouraged to enroll in the Dr. Edgar Housepian Global Introduction to Global Health Lecture Series (Fall semester), the Research Methods in Global Health course (Spring semester), and to apply for a first-summer Global Health Research Internship.

Advance planning of 6 months or more is recommended, as projects require local and Columbia IRB approval.

Dr. Neil W. Schluger,M.D., the Global and Population Health Track Director, is Professor of Medicine, Epidemiology and Environmental Health Sciences and Chief of the Division of

Pulmonary, Allergy and Critical Care Medicine at Columbia University. He also serves as Senior Advisor for Science at Vital Strategies, an NGO devoted to global public health issues.

Throughout his career, Dr. Schluger has focused on global aspects of lung health, including tuberculosis, the effect of air quality on health, the need to build a physician workforce in low and middle-income countries, and raising awareness of the global drivers of lung disease. He is a principal investigator in the Tuberculosis Trials Consortium, an international collaboration sponsored by the U.S. Centers for Disease Control and Prevention (CDC). He is the author of the Acute Respiratory Infections Atlas, which focused attention on the leading killer of young children in the world. He is also co-editor and a co-author of the 6th edition of The Tobacco Atlas, the definitive work describing the extent and consequences of the global epidemic of tobacco use. Dr. Schluger is a founder and director of the East Africa Training Initiative, a project to train pulmonary physicians in Ethiopia.

Other faculty and mentors in this track are drawn from the faculty of the College of Physicians and Surgeons and the Mailman School of Public Health.

RECENT PROJECTS (2015-2016)

Africa and Middle East
South Africa: Nutritional Rehabilitation and Anti-retroviral Therapy Initiation in Severely Malnourished HIV-Infected Children in Durban, South Africa
Zimbabwe: A Student-Driven Collaboration for Global Health Medical Education: Case Report of Piloting a Student-Run Free Clinic in Zimbabwe
Kenya: Assessing Men's Utilization of Health Clinics in Rural Kenya

South and Central America and Caribbean
Peru: Engagement in Care among HIV-Infected men who have sex with men and transgender women in Lima, Peru
El Salvador: Assessment of El Salvador National Hospitals
Dominican Republic: Evaluating prevalence and risk factors for Sexually Transmitted Infections (STIs) in HIV positive individuals in La Romana and Santo Domingo

Asia
Vietnam: Assessing the Health and Social Needs of Citizens Applying for Government Benefits for Victims of Agent Orange Exposure in the Phu Tho Province of Vietnam
Sri Lanka: Mental Health: A Homegrown Strategy for Healing and Reconciliation in Sri Lanka

Local
Factors that Facilitate Colorectal Cancer Screening in Washington Heights Dominican Women
The Silent STI: Prevalence of Chlamydia in Upstate New York Teens
Pilot Study with Choosing Healthy & Active Lifestyles for Kids (CHALK)

☐ MEDICAL EDUCATION

OVERVIEW

Physicians are teachers. We teach patients and their families about health and disease. We teach students and colleagues about the practice of medicine. The skills involved in teaching and learning are integral to the practice of medicine.

Medical curricula are always in flux. The body of medical knowledge and set of skills is ever-changing; the technology available to deliver education and assessment is ever-advancing. Fabulous opportunities exist to create exciting and efficacious curricular content, perform necessary assessment of existing education, and expand our understanding of the medical education process. P&S has outstanding faculty interested in medical education and interested in working with students on medical education projects.

There are many types of scholarship in medical education, and many types of projects that may be conducted as part of this track:

- The implementation and/or evaluation of new curricula or new technology.
- The evaluation of existing teaching activities towards improving their quality.
- Medical education literature review in an area of interest.

Experiences in the medical education track will according to the individual project, but may include a combination of:

- Mentorship with the medical education faculty
- Participation in P&S medical education committees
- Teaching in existing courses and programs
- Developing, implementing and evaluating new courses
- Exploring innovative uses of education technology
- Submitting scholarly work to MedEd Portal

Students will have access to a wide range of resources, including faculty throughout Columbia University, the Center for Education, Evaluation and Research (CERE), and the Columbia Center for Teaching and Learning (CTL).

TRACK DIRECTOR

Dr. Deepthiman Gowda, M.D., M.P.H., M.S., is an Associate Professor of Medicine at CUIMC. He graduated from the University of North Carolina School of Medicine, trained in Internal Medicine at Columbia and holds master's degrees in public health from Harvard and in narrative medicine from Columbia. Dr. Gowda is a national leader in clinical skills education and his areas of scholarship are in teaching and learning the history and physical and in the use of narrative medicine. He is the national co-chairperson for the Step 2 CS test development committee.

Dr. Gowda is a general internist and directs the Foundations of Clinical Medicine Tutorials course, chairs the Fundamentals Curriculum Subcommittee and serves as the Director of Clinical Practice for the Program in Narrative Medicine.

RECENT PROJECTS (2016-2017)

Developing Patient Education Resources in Orthopedics: An Interactive Module on Rotator Cuff Repairs

A Vision for Enhancing Feedback in Medical Education: Creating a four-year curriculum

Facilitating Orientation Discussions between Residents and Medical Students on Inpatient Rotations of the Major Clinical Year

The Development of a Human Rights and Medicine Lecture Series for Columbia Health Graduate Students

Finding New Ways to Teach Delirium at CUMC

Evaluating Alternative Methods of Medical Education

A mixed-method validation of the psychological sense of school membership scale in a medical student population

Final Literacy Education for Medical Students

James Abbott McNeill Whistler: Sea and Rain (1865)

OVERVIEW

The Narrative and Social Medicine Track welcomes students who want to investigate the personal, cultural, and meaning-making dimensions of health and health care. How do individual patients experience pain and suffering? What do clinicians face as they deliver care? What does it mean to be well? Students in this track grapple with questions that arise beyond the biotechnical explanations of disease, from fundamental questions about embodiment and mortality to justice questions about poverty and health. Think of this track as a place to wonder about the nature of our work: why we do what we do as physicians, what values guide our profession, how our training shapes us, and how to shape our futures in medicine. Think of it also as a chance to learn about patients' needs and desires as they face illness and its sequelae.

Narrative Medicine includes studies in the medical humanities—literary studies, history, philosophy, ethics, and religious studies as they pertain to aspects of health and health care. At Columbia, we include the visual and performative arts as well. Social Medicine refers to studies of health policy, economics, political aspects of health, quality improvement, and medical anthropology and sociology. We will sponsor projects of humanities and ethics scholarship, studies of patients' or clinician's personal experiences of illness or health care, projects in social justice in health/health care, creative representations that pertain to health, and policy/politics surrounding health care. Projects in this track adopt creative means of expression, intellectual and research methods from humanities disciplines, and social science qualitative research approaches. Mentors and supervisors are drawn from many units of the university including the health sciences, the school of the arts, arts and sciences, the school of journalism, and the law school.

TRACK DIRECTOR

Dr. Rita Charon, M.D., PH.D., is a general internist and literary scholar at Columbia, Professor of Medicine at CUMC, and Executive Director of the Program in Narrative Medicine. Dr. Charon graduated from Harvard Medical School in 1978 and trained in internal medicine at the Residency Program in Social Medicine at Montefiore Hospital in New York. She completed the Ph.D. in the Department of English of Columbia in 1999, writing on the late works of Henry James and on literary analyses of medical texts.

RECENT PROJECTS (2017-2018)

Is health care a right or a privilege? A student with experience in social activism in health care interrogates the idea of healthcare as a human right through a series of immersive participant-observation projects. Fundamental areas of inquiry will include what autonomy, agency, representation, and marginalization mean in healthcare access. The study will take place in an urban community of predominantly Mexican immigrants in Philadelphia, a rural community of agricultural workers in upstate New York, and a fact-finding mission to Cuba to learn of the current state of state-supported health care.

A student with a fine arts background exploring the emotional experiences of medical students and the accompanying effects on personal well-being. Working with a P&S graduate who is a staff cartoonist at *The New Yorker,* the student will create a graphic-novel representation of aspects of the medical student experience that thematically arise from interviews with classmates, including ways in which humor leavens and deepens their transformation into physicians.

A project combining medical history with creative fiction through an examination of the philosophical and neurological investigations of Thomas Willis. Professor of natural philosophy at Oxford and practicing physician in the 17th century, Willis coined the term "neurology," lent his name to the Circle of Willis, and proposed the brain (not the soul) as the seat of the self. This project focuses on Willis's clinical treatment of Anne Conway, a philosopher with a serious neurological ailment, whose philosophical thoughts intersected with Willis's. The project, mentored by a philosophically attuned neurologist, will approach its topic through an effort to fictionally represent the medical interviews between Willis and Conway.

A project mentored by an Emergency Medicine physician seeks to explore the experiences of persons who survive backcountry avalanches in the US. Although rare, deaths by avalanche in the US and Europe (around 150 per year) may be avoidable by rigorous preparedness. The student seeks to interview 7 survivor/rescuer dyads in the US toward exploring the prevalence of PTSD or other dimensions of the traumatic near-death experience. The goals include improving the treatment for those involved in these dramatic rescues and, perhaps, to clarify more generally the sequelae of naturally-caused disasters.

HISTORY OF MENTORING

As Odysseus left Ithaca to fight in Troy, he entrusted the care of his son Telemachus to his old friend Mentor. To Telemachus, Mentor was a trusted friend and teacher who provided perspective and wise counsel gleaned from experience.

The mentoring relationship has proved an invaluable part of personal and professional development. Joseph Haydn mentored Ludwig van Beethoven and Beethoven, in turn, mentored Franz Liszt. Many such relationships exist in medicine.

ACADEMIC MENTORS

The College of Physicians & Surgeons has had a long tradition of enriching the medical school's curriculum with longitudinal relationships with faculty. Here, mentors function as role models, teachers, advocates, advisors and guides. The scope of the mentoring relationship is unique to each mentor-mentee pair but should be discussed early and often.

ROLE OF THE MENTOR

In the context of the Scholarly Projects Program, mentors provide supervision and guidance to medical students in planning, executing and recording their scholarly work. The role of the mentor evolves with the project and with the student:

Introduction and exploration: In the first phase of mentorship, the potential mentor meets with the student to identify opportunities for collaboration and to determine whether the pair's interests, resources and interpersonal styles are compatible. If so, the pair will complete a **Mentorship Agreement**. If not, the faculty member will refer the student back to the Track Director and, if they wish, to colleagues who may be a better fit for the student.

Planning: In the second phase of mentorship, the selected mentor guides the student in preparing a **Project Proposal** that balances ambition with practicality. Scholarly projects should be innovative but may leverage existing resources (i.e., projects and initiatives already underway) to optimize the likelihood that in four months the student will achieve the project goals.

Execution: In the third phase of mentorship, the mentor oversees the student's work along the proposed trajectory. The student and mentor are expected to meet weekly to discuss the project and to submit a monthly **Progress Report** to the program. As unexpected problems or opportunities arise, the student and mentor will continually revise the plan for the remainder of the project.

Completion: In the final phase of mentorship, the mentor will guide the student in preparing the Capstone Requirement according to Track-specific standards. The mentor will also submit a **Final Evaluation** of the student's work, at which time the mentor will be compensated for their contribution. Please note there is a separate process of payment for mentors as part of a Global Health track project. Please contact psspp@columbia.edu for this information.

RESOURCES ON MENTORING

Sambunjak D, Straus SE, Marusić A. Mentoring in Academic Medicine. JAMA. 2006;296(9)1103-1115. Zerzan JT, Hess R, Schur E, Phillips RS, Rigotti N. Making the most of mentors: a guide for mentees. Acad Med. 200;84(1): 140-4

◆ MENTOR AGREEMENT

OVERVIEW

We ask mentees to review it with their mentors before starting their work together. The agreement is between the medical student (mentee) and the Scholarly Project mentor. We hope that it provides sufficient specificity so that mentee and mentor have discussed the frame of their relationship in the context of their project and have common expectations of one another. We also hope that it provides sufficient flexibility as we recognize that each mentee-mentor pair is unique and will have their own working style.

Students whose primary mentor is not a Columbia faculty member should complete this agreement with their administrative mentor in consultation with their Track Director.

MENTEE'S RESPONSIBILITIES

- Schedule regular meetings with mentor at a mutually determined time and location and for a mutually determined duration - we suggest meeting weekly

- Update mentor on progress regularly, including timely notification of unexpected delays or complications

- Prepare drafts of monthly Progress Reports and the Capstone Requirement for the mentor's review with adequate lead time to permit revision as necessary

- Work on the project consistently throughout the time allotted for the Scholarly Project and inform the mentor, Track Director and Scholarly Projects Coordinator of any interruptions or absences

- Attend Scholarly Projects didactics (as offered) regularly

MENTOR'S RESPONSIBILITIES

- Meet regularly with the student and monitor progress toward the proposed objectives

- Provide regular constructive feedback to the student on progress and performance

- Reach out to Track Director with any problems that are not amenable to resolution between student and mentor

◆ PROJECT PROPOSAL

General Guidance

The proposal should be brief (2-3 pages), with sufficient detail to provide your Track Director insight into your plans, using diagrams, graphs and lists if helpful. **Under no circumstance may you begin your Scholarly Project before your Track Director has notified you that your project proposal has been approved.**

Template

Student	Last, First	UNI	Expected year of graduation
Mentor	Last, First	UNI	Department
Affirmation	[ ] By checking here, I (the mentee) indicate that I have discussed the mentor agreement with my mentor and we have agreed to work together.		
Track	Indicate your track.		
Title	Title your project in 20 words or fewer.		
Aims	Describe what you want to accomplish with your project. Be specific. For research projects, you should state your research question and/or hypothesis.		
Background	Briefly explain why you have chosen the project you have and how the project fits into a larger area of inquiry/development of value to yourself, P&S, and/or society. For research-oriented projects, you should explain why your question is important and how the knowledge you obtain builds on prior studies.		
Significance	Describe how you expect the anticipated outcomes of your project will contribute to the area of inquiry/development referenced above.		
Methods	Outline and describe the sequence of activities you will do to complete your project, including the preparation of your Capstone product, which you will describe below. For research-oriented projects, you should describe such items as study design, obtaining IRB approval, selection of subjects, data collection and analysis.		
Capstone	Describe what you will produce to synthesize and share project outcomes. This should be a 15-20-page paper, unless, with approval of your mentor and track director, you decide on an alternative format better suited to the nature of your project.		
Timetable	Describe the general timetable for project activities (i.e., months you have dedicated to work on the project) and the timeline of key milestones.		
	2016 ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec 2017 ☐ Jan ☐ Feb ☐ Mar		
Roles and Responsibilities	Describe the expected contributions essential to project completion of individuals involved in your project, including yourself, your mentor, and, if applicable, other students and/or members of the mentor's team. For research-oriented projects, your description should include information about if and how your project dovetails with other projects.		
Ethical Approval	Please state if your project requires IRB review and/or approval and, if so, at what stage is your submission (approved, submitted, in development). *Note: If your project involves the use of humans and/or animals, you will not be able to start until IRB and/or IACUC approval is obtained.*		
References	Please do not exceed 10 references.		
Budget	Please include an estimate of any anticipated expenses associated with your project.		
Supervisory Approvals	Your proposal needs to be reviewed and approved by your mentor prior to submission. Please indicate when you obtained this approval from your mentor.		

◆ FUNDING REQUEST

General Guidance

All students are eligible for a reimbursement of up to $500 for expenses related to your project. Typical expenses include supplies, travel costs, conference registration and consultation fees. If you anticipate your expenses exceeding this amount or if you have an unusual expense, please contact Dr. Bulman to discuss your needs.

Process

To make the reimbursement process as smooth as possible, please follow the following steps:

- Make sure you have posted your finalized project proposal to CourseWorks.
- Download the ***Funding Request Form*** from CourseWorks and return to psspp@columbia.edu.
- Download and print the ***Tax Exemption Form*** from CourseWorks for your use when purchasing items. Please note that you will NOT be reimbursed for sales tax on your purchases.
- Email ALL original receipts for items purchased to the Scholarly Projects Program Coordinator at psspp@columbia.edu. Remember to keep all receipts, as you will not be reimbursed without these. Reimbursements typically take up to 14 business days.

Template

Student	Last, First	UNI	Expected year of graduation	Citizenship
Mentor	Last, First	UNI	Department	
Track	Indicate your track.			
Title	Indicate your project title.			

Category	*Description (Itemize and briefly describe how this item pertains to your project)*	*Total*
Consultant		
Equipment		
Supplies		
Travel		
Total Funds Requested		$

Review (please do not write below this line – for internal use only)	*Date*

◆ SARA AND ARNOLD P. FRIEDMAN AWARDS

Overview

In 2012, Dr. Carol Ludwig (P&S Class of 1974) generously committed funds to establish the Sara and Arnold P. Friedman Awards. These awards support student expenses for selected projects requiring funding beyond the P&S limit of $500. Awards are granted based on the merit of the proposed project.

Suitable Expenses

Suitable expenses for the Friedman Awards include travel costs (airfare, lodging), costs associated with working in another site (external IRB and facility fees, health expenses, etc.), supplies related to conducting your work and costs associated with attending academic meetings relating to your work (with preference for conferences at which you are presenting your findings). In reviewing your proposed budgets, the Awards committee may award support for some, but not all items.

Application Process

The Awards committee meets three times each academic year (March, July and November) to review applications and grant awards. To apply for the Sara and Arnold P. Friedman Awards, please send a cover letter, your project proposal, your budget (on the attached form) and a brief letter of support from your mentor to psspp@columbia.edu. Please note global health projects require additional application materials available from the Scholarly Projects office. Application deadlines are at noon on *March 1*, *July 1* and *November 1*. Late applications are not accepted.

Template

Student	Last, First	UNI	Expected year of graduation	Citizenship
Mentor	Last, First	UNI	Department	
Track	Indicate your track.			
Title	Indicate your project title.			

Category	Description (Itemize and briefly describe how this item pertains to your project)	Total
Consultant		
Equipment		
Supplies		
Travel		
Total Funds Requested		$

Review (please do not write below this line – for internal use only)	Date

◆ THE CAPSTONE

Overview

The purpose of the Capstone is two-fold: (i) to reflect the rigorous intellectual engagement with the scholarly project work, and (ii) to document the progress made towards the goals of the scholarly project.

At the completion of the scholarly project work, students are required to submit the *Capstone*, a 15-20 page paper that elaborates the purpose of the scholarly project work and details the process and results of the project. In some cases, papers will be accompanied by additional resources that were developed as part of the scholarly project work (e.g. a learning resource, a creative work, etc.), but is similarly not required. Students will also be required to create a *Digitized Poster* for publication on the Scholarly Projects Program web site.

The Capstone will serve as the basis for determining satisfactory performance of the scholarly project work; the electronic poster will serve the growing community of students and faculty engaged in student scholarly work by detailing the successes and challenges met along the way.

The project mentor and Track Director will evaluate the Capstone and the Digitized Poster. Final grade will be Pass/Fail.

Guidance for Hypothesis-Driven Projects

Capstones for hypothesis-driven projects should take the form of a scientific paper. Because the time is short, results may be limited.

Nonetheless, four months is plenty of time to learn a lot about your topic. Your Capstones should be written clearly and demonstrate your satisfaction of Glassick's criteria: clear goals, adequate preparation, appropriate methods, significant results, effective presentation and reflective critique. The following are elements of a traditional scientific paper:

Abstract. Summarize in one page what you have accomplished, including Background, Methods, Results, and Discussion sections.

Introduction. What is the problem? Why is it important? What is known from previous work? Where has progress been slow? The relevant literature should be reviewed, with proper citation.

Methods. Methods should have enough information to explain how a technique works, but great detail need not be included except as references. If a new technique has been developed, detail is warranted. If appropriate, please describe your statistical approach to study design (i.e., power calculations, etc.).

Results. Results describe the outcomes of your investigation. Typically, this would include 1-3 illustrations and 1-2 tables summarizing relevant data. You should prepare your own graphs and tables, so that you will learn the mechanics of doing this and also of the statistics involved. Please explain your results carefully.

Discussion. The discussion should build on the introduction, but with results now included. Feel free to discuss your ideas for new research opportunities as long as they are critical assessments.

Guidance for Intellectual & Creative Projects

Intellectual work may take many forms, but will also be evaluated by Glassick's criteria, with particular emphasis on the coherence of ideas, evidence of due research in the scholarly literature, originality of production and quality and clarity of the writing.

Submitting your Capstone

Your Capstone and poster submission is due to Courseworks at the end of your final Scholarly Project month, after which your mentor and Track Director will review and complete an evaluation in OASIS.

Resources

Endnote, PubMed, and William Zinsser's On Writing Well.

◆ FINAL EVALUATION

Overview

The Capstone is the scholarly product describing the student's work over the four months of her/his scholarly project. Mentors review the Capstone to comment on the student's fulfillment of Glassick's Criteria of scholarship. Track directors assign the final grade.

Template

Student	Last, First	UNI	Expected year of graduation	Date
Mentor(s)	Last, First	UNI	Department/School	
Track	Basic Science			
Title	Project title			

Capstone		Low - High
• Goals	Did the student set clear, intelligible goals from the outset?	1 • 2 • 3 • 4 • 5
• Preparation	Did the student show an understanding of existing scholarship in the field? Did the student bring necessary skills to this work of scholarship? Did the student bring together the resources necessary to move the project forward?	1 • 2 • 3 • 4 • 5
• Methods	Did the student use methods appropriate to his/her goals?	1 • 2 • 3 • 4 • 5
• Results	Did the student achieve his/her goals? Did the student's work contribute to his/her field of scholarship? Did the student's work open additional areas for further exploration?	1 • 2 • 3 • 4 • 5
• Presentation	Did the student use a suitable style and effective organization to present his/her work? Did the student use appropriate forums for communicating work to its intended audiences? Did the student present his/her message with clarity and integrity?	1 • 2 • 3 • 4 • 5
• Reflection	Did the scholar critically evaluate his/her own work? Did the scholar bring an appropriate breadth of evidence to his/her critique? Did the student use evaluation to improve the quality of future work?	1 • 2 • 3 • 4 • 5
Overall		1 • 2 • 3 • 4 • 5

Professionalism		Low - High
Maintaining Effective Communication		1 • 2 • 3 • 4 • 5
Setting Clear Expectations		1 • 2 • 3 • 4 • 5
Assessing Understanding		1 • 2 • 3 • 4 • 5
Fostering Independence		1 • 2 • 3 • 4 • 5

Track Director Comments	
Final Grade	Pass / Fail

◆ IRB POLICY ON STUDENTS AS RESEARCHERS

SCOPE

This Policy applies to all human subjects research conducted by students at Columbia University ("Columbia") and clarifies which research projects or activities require review by the Columbia Institutional Review Board (IRB) for the protection of human subjects in research.

EFFECTIVE DATE

March 16, 2012

BACKGROUND

All federally-supported or conducted activities constituting human subjects research must be reviewed by an IRB prior to initiation of the research in accordance with regulations of the Department of Heath and Human Services (45 CFR 46) and the Food and Drug Administration (21 CFR 56) (collectively, the "Regulations") unless such research activities are exempt from review pursuant to 45 CFR 46.101(b) and 21 CFR 56.103(b) ("Exempt Research"). It is Columbia's policy that such requirements apply to all human subjects research, whether or not federally-supported, including research by students, and that research that may constitute Exempt Research must also be submitted to the IRB for a determination that such research should in fact be considered exempt.

Human subjects research is defined as follows: "Research": a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. "Human subject" is a living individual about whom an investigator (whether professional or student) conducting research obtains (1) data through intervention or interaction with the individual, or (2) identifiable private information.

The process of learning about and practicing research methodology (i.e., pedagogical research) may require student investigative activities that involve humans but do not,

under the Regulations, require IRB review because such activities do not fall within the federal definition of Research (as defined above). Recognizing that some pedagogical research activities may present more than minimal risk of harm to participants and considering the relative inexperience of students in applying research methods, Columbia requires submission of some student projects that do not meet the federal definition of Research, in order to protect the subjects in such activities. For the sake of clarity, Section IV.A. of this Policy articulates the criteria of projects that do not have to be submitted for review. All student projects that involve humans and do not meet such criteria must be submitted for IRB review.

POLICY

Except as provided in (A) below, all research activities involving human subjects and conducted by Columbia students must be approved by the IRB prior to the initiation of the research activity. This Policy applies to human subjects research activities that are broader than those defined in the Regulations and includes classroom activities that may not be considered Research, but may involve greater than minimal risk to subjects.

In the case of student course-related research projects, it may be difficult at times to distinguish between those that require IRB review, and those that are designed simply to learn and/or practice research methodology. The IRB has established the following guidelines for determining when IRB review is necessary for projects that are related to an academic course or program.

A. Low Risk Introductory Research Methodology Exercises (No IRB submission required)

Student projects that are designed solely to provide students with an opportunity to learn or practice research methods do not require IRB review if they meet all of the following criteria:

(1) take place in a classroom, department, dormitory, or other campus setting, or in a public setting with generally unlimited access

to the public, such as a shopping center, park, or street;

(2) involve only the learning of research techniques and are not designed to potentially advance the literature;

(3) involve **no** more than minimal risk to subjects (Minimal risk is defined as the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests); and

(4) utilize anonymous collection of data (i.e., with no names, social security numbers, or other direct identifiers; and without codes that can be linked to a list of names; and including no indirect identifiers or information that when combined would allow identification of the subject).

Research conducted over the internet will not be permitted under this category.

B. Research Projects, Directed or Independent (IRB submission required)

Any research conducted by students that involves human subjects but does not constitute a research methodology exercise or practicum, as characterized in Section IV.A. above, must be reviewed by the IRB. This includes, but is not limited to, all undergraduate and graduate research projects whether or not conducted to fulfill course or degree requirements, undergraduate senior, undergraduate honors, or masters' theses, and doctoral dissertations.

Research projects are either "Exempt Projects" or "Non-exempt Projects".

(1) Exempt Projects

Student projects that constitute Exempt Research must be submitted to the IRB for determination that they are eligible for exemption. A complete listing of the federal exemption categories is attached as Appendix A and is also available online at:

http://ohrp.osophs.dhhs.gov/humansubjects/guidance/45cfr46.htm#46.101

When all students in a class are using similar methods of recruitment and data collection, in the same or similar projects that are no

more than minimal risk to subjects, the instructor may submit a proposal to the IRB for determination that all such projects are exempt, rather than requesting such determination on a project by project basis.

(2) Non-exempt Projects

All non-exempt student research projects must be submitted individually for IRB review.

Non-exempt projects that are minimal risk will require either review by an experienced member of the IRB ("Expedited Review") or review by a convened IRB (full Board review).

To be eligible for an Expedited Review, the research must involve: a) no greater than minimal risk to subjects; and b) procedures that fall into one or more of the categories of research identified as eligible for Expedited Review by the Regulations.

A complete listing of the federal expedited review categories is attached as Appendix B and is also available online at:

http://www.hhs.gov/ohrp/humansubjects/guidance/expedited98.htm

Projects that are neither Exempt Research nor eligible for Expedited Review must be evaluated at a convened meeting of the IRB. In such cases, the protocol must be submitted sufficiently in advance of an IRB meeting to be added to the agenda and distributed for in-depth review prior to the meeting. For assistance in planning submissions, IRB meeting dates are posted on the Columbia IRB websites (click on "About the HRPP/IRB"; links to home pages are provided at the end of this document).

C. Responsibility of Faculty Advisors for all Student Research Projects

Columbia's policy requires that, unless an appropriate waiver is obtained, the individual who is named as Principal Investigator ("PI") on a research project must have a particular academic or research ranking in accordance with Columbia policy. No student researcher may serve as the PI on a protocol that is submitted for IRB review; however, he/she should be named as a co-investigator.

Faculty advisors as well as student researchers must complete required training

before conducting research with human subjects (or serving as a PI on student research projects). The training is available online; course details and specific instructions may be found on the Columbia IRB websites at:

http://cumc.columbia.edu/dept/irb/education/index.html#Required%20Training

It is the responsibility of the faculty advisor to determine when a student project that is conducted to fulfill a course requirement does not meet the definition of a research methodology exercise or practicum and must be reviewed by the IRB. Advisors should be familiar with relevant regulations and policies so that they may guide students in selecting the topic of their research project, and assist in preparing review materials for the IRB. In addition, the advisor and student have a shared responsibility to ensure that all research activities, whether research methodology exercises or practice, exempt projects, or protocols that have received IRB approval (whether expedited or full Board), are conducted according to the approved protocol and the ethical standards of the relevant discipline.

D. Responsibility of Students for all Student Research Projects

It is the responsibility of the student researcher to conduct the study in accordance with the IRB-approved protocol. Any change to the research must be submitted for prospective IRB approval prior to implementation. If a change is necessary to minimize or avoid harm to currently enrolled subjects, and there is no time to obtain IRB approval, such a change should be implemented immediately by the researcher. Even in this latter situation, a modification must be submitted as soon as possible to the IRB.

Students must also ensure that the research study maintains a current IRB approval. The PI of the study must submit the protocol for re-approval by the IRB at least 60 days prior to the expiration of IRB approval, if such research will continue beyond the expiration date. Once IRB approval expires, all research activities must cease until re-approval has been granted by the IRB.

Students must keep their advisors informed of the progress of the research and any harm(s) that may occur to human subjects as certain harms or increased risks to subjects must be reported to the IRB in accordance with the Reporting of Unanticipated Problems policy. When the study has been completed, or if the student will complete his/her relationship with Columbia and Columbia will no longer be involved in the research, the student must ensure that a "Termination" has been submitted to the IRB in RASCAL.

Columbia IRB Websites

CU-MS IRB:

http://www.columbia.edu/cu/irb/

CUMC IRB:

http://www.cumc.columbia.edu/dept/irb/