

THOMAS JEFFERSON UNIVERSITY

MD/PhD PROGRAM HANDBOOK

2021 - 2022

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I. Mission

The MD/PhD Program at Thomas Jefferson University is a dual degree program that prepares students for careers in academic medicine.

Our program aims to provide our students with the skills to provide outstanding patient care, lead discovery in biomedical research, advocate for basic and translational research, assume leadership roles in biomedical research and the delivery of health care, and serve as role models for the next generation of physician scientists.

Our goal is to produce motivated and enthusiastic physician investigators who will elect a life-long career in biomedical research, translating fundamental discoveries into improved health care delivery, and serving as role models for the next generation of investigators.

II. Structure of the Program

TJU MD/PhD Administration

Name	Position in Program	Academic Position	Contact Information
Scott A. Waldman, MD, PhD	Co-Director	Professor & Chair, Pharmacology & Experimental Therapeutics	Scott.Waldman@jefferson.edu 368J JAH 215-955-6086
Manuel Covarrubias, MD, PhD	Co-Director	Professor, Neurosciences	Manuel.Covarrubias@jefferson.edu 231 BLSB 215-503-4341
Gerald B. Grunwald, PhD	Chair, Steering Committee	Dean, Jefferson College of Life Sciences	Gerald.Grunwald@jefferson.edu M63 JAH 215-503-8982
Danielle Park	Program Coordinator	Jefferson College of Life Sciences	Danielle.Park@jefferson.edu M46 JAH 215-503-0164

Our administrative structure allows greater control and involvement in setting standards and requirements for the both MD and PhD degrees.

Administrative oversight for the Program is provided by the MD/PhD Steering Committee, chaired by Dr. Gerald Grunwald, Dean of the Jefferson College of Life Sciences and Professor of Pathology, Anatomy & Cell Biology, and is composed of faculty, including the Co-Directors, involved in the scientific and/or clinical training of MD/PhD students. Members of the committee include: Alisa LoSasso, MD, Associate Dean for Admissions in the SKMC and Associate Professor, Department of Pediatrics; Wayne Lau, MD, Assistant Dean Office of Student Affairs and Professor, Department of Emergency Medicine; Ross Summer, MD, Division of Pulmonary and Critical Care Medicine; and Nancy Philp, PhD, Associate Dean for PhD Students, JCLS and Professor, Department of Pathology, Anatomy & Cell Biology. Administrative members include Bonnie Emilius, Director of Admissions for SKMC; Marc Stearns, Director of Admissions for the Jefferson College of Life Sciences, and Danielle Park, MD/PhD Program Coordinator. There are two student representatives to this committee, elected by the JPSA.

The Program Office, comprising the co-Directors and the Program Coordinator, carries out day-to-day administrative duties. The Program Office closely coordinates all administrative functions, program meetings, and program activities.

The Program Coordinator maintains student records and provides administrative support to the Program co-Directors. The Program Coordinator also assists the Jefferson Physician Scientist Association with organizing their planned activities.

III. Financial Support of MD/PhD Students

Students in the MD/PhD Program receive fellowship support for each year in the Program. This support provides for full college tuition as well as a stipend for living expenses. The fellowship support is renewable for each year in the Program, provided the student maintains the high level of academic performance required by the Program.

During the medical school years, stipend support is provided through SKMC. Upon transition to graduate study, support will be through Jefferson College of Life Sciences for the first five months of the first year. Thereafter, and in all remaining PhD years students receive their stipend support from their PhD mentors. The MD/PhD Program has a policy that no mentor can have more than 2 MD/PhD students at one time, and no more than 1 from a single class. Exceptions to this policy may be granted under unusual circumstances.

Students are required, in consultation with their research advisors, to identify appropriate sources of extramural support and to apply for Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral MD/PhD or Other Dual-Doctoral Degree Fellowships (F30). However, funding within the program does not depend on receiving such support. It is important to note that there are specific time limitation and eligibility requirements for the F30.

Stipends are disbursed bi-weekly or monthly depending upon the funding source. As described above, funding sources will vary during time in the Program; students should be prepared to complete forms and/or receive different numbers of checks as funding source changes. Checks can be retrieved from the Jefferson College of Life Sciences Finance Office located in room M63 Jefferson Alumni Hall. Any questions regarding stipend should be directed to the Finance Office at 215-503-0150.

The following items are included in the MD/PhD Fellowship:

Stipend: \$32,100 (2021 - 2022 Academic Year)

Tuition and Fees: As appropriate for the school (SKMC or Jefferson College of Life Sciences) of current enrollment.

Health and Dental Insurance: Not as part of the fellowship during SKMC years, health coverage during PhD years is for student only. The student pays for health insurance during SKMC years. During PhD years, the student can pay an additional amount for dental coverage and/or dependent health coverage.

IV. MD/PhD Advising

MD/PhD advising is not meant to duplicate or interfere with the primary guidance provided by the SKMC Office of Student Affairs, PhD thesis mentor, student's research committee, or PhD Program

responsible for each student. Instead, MD/PhD advising centralizes these activities, to ensure that each student makes appropriate progress and satisfies the expectations of the MD/PhD Program.

Students will meet regularly with the MD/PhD co-Directors to review progress, academic and research achievements, program and professional plans, and changes and concerns.

During SKMC 1 and 2 students are advised by the MD/PhD co-Directors, in regular one on one meetings and group meetings. Meetings will focus on academic performance, integration into MD/PhD program specific curricular elements, personal well-being, selection of rotation mentors and laboratories, progress toward successful completion of USMLE Step 1, transition into the research phase of the program, and final selection of a thesis mentor and PhD Program.

During the PhD years, regular meetings with the MD/PhD co-Directors will continue, but primary guidance will be through the research committee. One of the Program co-Directors should be identified as an 'ex-officio' member of your research committee and should always be notified of committee meetings, as are the regular members of your committee. This, of course, is not necessary if one of the Program co-Directors is your thesis mentor or is serving as a member of your research committee.

V. Activities

A number of MD/PhD Program specific activities supplement the training provided by SKMC and Jefferson College of Life Sciences. These activities are instrumental in establishing a core identity, promoting the unique development of physician scientists and allowing them to identify with a cohort group with similar goals and interests. (See Appendix H)

- Translational Research Journal Club meets monthly to provide opportunities for students in the MD/PhD program to read, interpret, synthesize, and present literature in translational science to peers and faculty. The journal topics specifically focus on translational research appearing in the highest impact scientific journals.
- Progress in Translational Research Seminar meets monthly to allow students to present the results of their ongoing thesis research. Research presentations highlight the translational applications of the research that will solve a clinical problem, impact patient care, or prevent disease in individual patients or populations.
- Case Studies in Molecular Medicine meets monthly to provide concrete case studies in which novel molecular concepts are applied to the development of new diagnostic and therapeutic modalities for patient management. This program challenges trainees to think critically about the realistic and practical applications of laboratory-based discoveries and provides a context for the processes, steps and timelines required for translation from bench to bedside.
- Physician Scientist Mentorship Series provides an opportunity for MD/PhD students to learn from active, successful and productive physician scientists about training opportunities, career pathways, and the integration and balance of laboratory and clinical activities and personal/professional life. Beyond these elements, this series also offers network opportunities and exposure to the science of eminent regional and national investigators. These talks are presented semi-annually in an informal, intimate and collegial dinner setting.
- Enrichment Course in Clinical Skills ensures the training and preparedness of MD/PhD students entering the clinical clerkship years of medical school and facilitates the transition from graduate school back into medical school. 3rd year MD/PhD students in their 1st year of PhD training are to

enroll in the Enrichment Course in Clinical Skills (GC 725) for the Fall Semester. The course is optional after the fall of the first PhD year.

- MD/PhD Scholars Retreat annually provides an opportunity to showcase the scientific achievements of the students, disseminate important programmatic information in a peer-to-peer fashion, provide mentoring opportunities and further build community. Students from all stages of training are given the opportunity to present to and learn from other students. A keynote speech by an active physician scientist whose primary charge is to provide career insights. The evening includes dinner and social activities. Retreat program and activities are planned and organized by the Jefferson Physician Scientist Association (JPSA) in conjunction with the co-Directors.
- Annual Orientation. MD/PhD program students have a separate orientation for an afternoon and evening, organized around a welcome barbecue. The afternoon is spent meeting their fellow students from all phases of the MD/PhD program. Experienced (upper class) students present information regarding specific elements of the program, including requirements, operations, and responsibilities. New matriculants learn about the preclinical training phase, the integration of MD/PhD program components, and the strategies and logistics of organizing rotations. There is time built into the orientation specifically for small group interactions to discuss survival skills in the earliest phases of training. After dinner, social activities are planned for attendees. Orientation is organized by JPSA under the direction of the co-Directors.
- The American Physician Scientist Association (APSA) is a national organization dedicated to addressing the needs of future physician scientists with respect to their training and career development. Founded in 2003, APSA held its first Annual Meeting in 2005 and has grown tremendously in the ensuing years. APSA strives to be the student physician-scientists' leading voice for improving educational opportunities, advancing patient-oriented research, and advocating for the future of translational medicine; as such it is a student led organization, by trainees, for trainees. Jefferson has an institutional membership so all students in the MD/PhD Program are APSA members.

VI. Jefferson Physician Scientist Association

The Jefferson Physician Scientist Association (JPSA), founded in Fall 2010 with the purpose of advancing the future of translational medicine, represents the position of MD/PhD student in academic and extracurricular matters. Membership includes all students enrolled in the MD/PhD Program who are primarily recruited at the annual MD/PhD orientation and welcome in early fall of each academic year. Officers are elected annually.

- President (2021): Josh Barton
- Secretary (2021): David Jaffe
- Treasurer (2021): Kevan Ip
- VPs for Academic Affairs (2021): Debotri Chatterjee, Miao Cao
- VPs for Educational Enrichment (2021): Usman Baqai, Rachel Cain
- VPs for Community and Cultural Affairs (2021): Haani Jafri, Yanki Yarman
- VPs for Recruitment (2021): Signe Caksa, Tyler Alexander
- APSA Institutional Representative: Selin Isguven

Academic Affairs: Sit on the MD/PhD Steering Committee and represent students at all stages of the program; serve as the leading student voice for recruiting, admissions and MD/PhD program direction and development. Organize two annual mentorship dinners with an invited speaker.

Educational Enrichment: Organize educational and career-development seminars for the MD/PhD students. These include annual opportunities for students to share advice (“how-to apply for an F-30”, “how to choose a lab rotation”, and “how to return to med school” seminars), as well bimonthly clinical skills sessions with current residents.

Community and Cultural Affairs: Coordinate efforts to interact with groups and individuals outside the JPSA community; creating and maintaining an alumni network; serves as president of MD/PhD Social Committee; spearhead all social activities throughout the year.

Recruitment: Represent students on admissions committee (non-voting); develop and organize interview days; 2nd look visits, and be the interface between applicants and current students.

VII. Student Requirements

While ALL students are encouraged to participate in JPSA and recruiting activities while they are in the Program, the following are minimal requirements for graduation.

First Year

1. Research rotation: This is a key decision for first year students and must be done in consultation with MD/PhD co-Directors. Two 8-week research rotations are required. The first rotation should be completed prior to the start of Orientation for JeffMD Phase 1, Year 1 and the second rotation should be completed in the summer prior to the start of Orientation for JeffMD Phase 1, Year 2 as part of the JeffMD Scholarly Inquiry requirement (see appendix C).
2. Complete research rotation report
3. Attend MD/PhD Orientation
4. Attend Welcome Barbecue
5. Attend weekly meetings of Current Topics in Translational Biomedical Research each semester/session.
6. Attend Annual Retreat
7. Attend Physician Scientist Dinners
8. Attend periodic meetings with MD/PhD co-Directors as required.
9. Successfully complete all coursework requirements.

Second Year

1. Complete second research rotation in the summer prior to the start of Orientation for JeffMD Phase 1, Year 2 as part of the JeffMD Scholarly Inquiry requirement (see appendix C).
2. Continue attendance at weekly meetings of Current Topics in Translational Biomedical Research each semester.
3. Attend Welcome Barbecue
4. Attend Annual Retreat
5. Attend Physician Scientist Dinners
6. Attend periodic meetings with MD/PhD co-Directors as required.
7. MD/PhD Program administratively requests leave of absence from SKMC in order to join JCLS at end of JeffMD Phase 1, Year 2.
8. Successfully complete USMLE Step 1 before the end of the USMLE Step 1 Review Period and the beginning of JeffMD Phase 2, usually mid-April.
9. Successfully complete all coursework requirements.
10. Select a mentor and PhD Program after meeting with the MD/PhD co-Directors. As you make your decision, please note that the MD/PhD Program has a policy that no mentor can have more than 2 MD/PhD students at one time, and no more than 1 from a single class (see previous, p. 4). Since most thesis mentors participate in more than one PhD Program, decisions about which Program to select are based on discussions with the mentor, PhD Program Directors and MD/PhD co-Directors.

Third Year through Completion of PhD

1. Continue attendance at weekly meetings of Current Topics in Translational Biomedical Research each semester/session; register for GC 710 (F), 712 (Sp), 1 credit each semester.
2. Attend Welcome Barbecue
3. Attend Annual Retreat
4. Attend Physician Scientist Dinners

5. Register and participate as appropriate in GC 725 Enrichment Course in Clinical Skill Fall of 1st year in PhD. Optional for each semester after fall of 1st year PhD. (1 credit each semester).
6. Form research committee, including one ex-officio MD/PhD representative
7. Submit application for [Ruth L. Kirschstein Individual Predoctoral National Research Service Award Fellowship](#) (F30 for MD/PhD, preferred, or F31 for PhD or equivalent Fellowship).
8. Attend Ethics Case Conferences once a month and make one presentation during third year of PhD studies (fifth year in MD/PhD Program).
9. Optional: GC 630 - Fundamentals of Clinical Trials
10. Optional Rotation on the Cancer Clinical Research Review Committee
11. Optional Rotation at Annals of Internal Medicine
12. Successfully complete all PhD requirements as set forth by the selected PhD Program including
 - a. required coursework
 - b. regular research committee meetings
 - c. comprehensive examination
13. Have at least 1 first author paper accepted for publication

Nearing the End of PhD

1. The Program Coordinator will poll 4th year PhD students regarding return to SKMC JeffMD Phase 2. In order to return to JeffMD Phase 2, returning students must complete the thesis defense and all associated requirements six weeks prior to return and participate in the mandatory structured clinical re-immersion program provided by SKMC. See Appendix for details.
2. Notify Program Coordinator of the thesis defense date
3. Successfully complete defense of thesis including all PhD Program and Jefferson College of Life Sciences requirements by March 1 in order to return to SKMC 3 in mid-April.
4. Complete the mandatory structured clinical re-immersion program provided by SKMC prior to returning to SKMC 3.

Program Years 7 and 8: The Clinical Years

1. Present one Clinical Case Study in Molecular Medicine each year. Continue weekly attendance at Current Topics in Translational Biomedical Research as clinical schedule allows.
2. Attend Welcome Barbecue
3. Attend Annual Retreat. If unable to attend due to a professional conflict, notify the Administrative Director in advance.
4. Successfully complete SKMC requirements

VIII. Curriculum

A critical aspect of our MD/PhD Program is the integration of physician-scientist training across all years. Descriptions of SKMC curriculum can be found in the SKMC Handbook and course catalog available at <http://www.jefferson.edu/university/skmc/student-resources.html>

A total of 70 credits are awarded for the first two years of regular medical school coursework, accounting for a substantial number of the credits required for the PhD thesis. Additional didactic credits and research credits are awarded for MD/PhD specific coursework. Thus, MD/PhD students should be able to fulfill most remaining coursework early, providing significant time for bench research. Some courses are required of MD/PhD students in all PhD Programs and are listed below; other requirements are Program specific. As much of remaining coursework as possible should be completed during JCLS 1.

MD/PhD Specific Courses

- GC 710, 712-- **Current Topics in Translational Biomedical Research I, II** (1 cr. each, Fall, Spring) This course explores aspects of translational research and molecular medicine through the venues of Translational Research Journal Club, Progress in Translational Research Seminar, Ethics Case Conference, and Case Studies in Molecular Medicine. It is required in each year of PhD studies.
- GC 725 - **Enrichment Course in Clinical Skills for Physician Scientists** (1 cr. each, Fall, Spring) The course is composed of a variety of clinical options in which trainees participate over the 4 years of the research phase to foster and enrich the students' clinical skills. Trainees can provide monthly service to JeffHope, a resident-run clinic that provides healthcare to the underserved urban populations in Philadelphia. Also, they can participate in physical diagnosis rounds and morning report. Physical diagnosis rounds involve patients admitted to the medical services of Thomas Jefferson University Hospital. On these rounds, also attended by a small group of medical residents, trainees are exposed to a diverse group of patients where auscultatory, visual, and tactile skills are practiced. Following rounds, morning report occurs, where case presentations are used to develop differential diagnosis skills. Further, trainees can work with one master clinician (from a selected list of physician mentors) each month, across specialties, for one day, seeing patients, reviewing histories and physicals, interpreting laboratory studies, and synthesizing data to formulate diagnoses and management plans. These rotations are required, attendance is mandatory and recorded. It is required in each year of PhD studies.
- Optional GC 630 -- **Fundamentals of Clinical Trials** (3 cr.) This course introduces the fundamentals of design and analysis of clinical trials. Some of the design issues discussed include specifying and operationalizing the scientific question of interest, the role of a control group randomization, blinding, and sample size determination. The course focuses on statistical aspects of the analysis of clinical trials, including various statistical estimation and testing procedures, the intent to treat principle, interim analysis, and statistical and scientific inference. Students learn to critically review published reports of clinical trials through participation in small group discussions and individual written critiques. This is a required course usually taken during the third year of PhD studies.
- **Optional Rotation on the Cancer Clinical Research Review Committee (CCRRC)** This committee of the Kimmel Cancer Center evaluates the scientific validity of patient-oriented studies in oncology at TJU. Rotation on this biweekly committee is an opportunity to obtain hands-on experience reviewing the scientific merit of clinical protocols. Trainees are supervised by Dr. SA Waldman, the Chairperson of the CCRRC, who guides analyses, addresses questions, and provides feedback. Trainees rotate on the CCRRC for 6 one hour meetings. Contact [Dr. Scott Waldman](#) for more information.
- **Optional Rotation: Critical Review of the Scientific Literature** The Annals of Internal Medicine is the flagship publication of the Philadelphia-based American College of Physicians-American Society of Internal Medicine (ACP-ASIM). It is considered the premiere worldwide internal medicine journal. Editor **Christine Laine, MD, MPH** has offered members of the MD/PhD Program unprecedented access to the editorial process through a 4-week rotation. Enrollees can participate in the weekly editorial and statistical meetings of the journal. Maximal benefit of the rotation is obtained when participants read a majority of the articles being discussed. *Therefore, participants should schedule this optional rotation during a period when they have the time to devote to preparation for each session.* Contact [Dr. Walter Kraft](#) for more information.

IX. PhD Programs

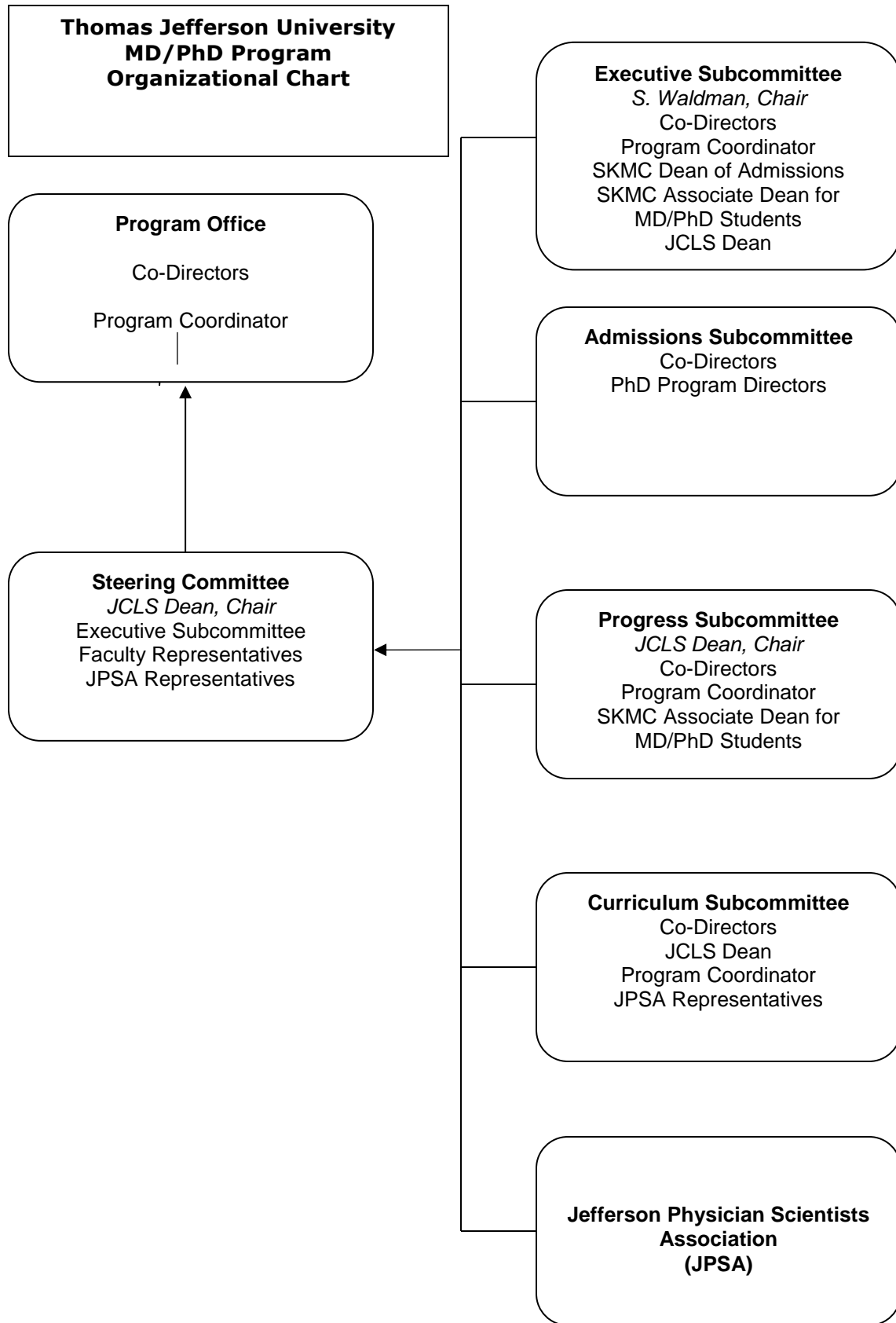
The doctoral programs within the Jefferson College of Life Sciences offer cutting edge interdisciplinary education and research training under the mentorship of nationally and internationally recognized faculty. The Director of the selected Program along with the MD/PhD co-Directors oversees the student's PhD training. It is expected that students will perform their PhD training with a mentor in a laboratory in one of the 6 PhD programs at Jefferson. In addition to selecting a mentor for PhD thesis research, each student will need to choose a PhD Program. This decision should be made in consultation with the thesis mentor, the MD/PhD co-Directors, and the Director of the PhD Program of interest. Many mentors participate in more than one PhD Program; thus multiple PhD Program Directors may need to be consulted before reaching a final decision. Visit the [Jefferson College of Life Sciences](#) website for more information.

Name of Program	Program Director	Contact Information
Biochemistry & Molecular Pharmacology (BMP)	Edward Winter, PhD	228 BLSB 215-503-4139 Edward.Winter@jefferson.edu
Cell Biology & Regenerative Medicine (CBRM)	Nancy Philp, PhD	263 JAH 215-503-7854 Nancy.Philp@jefferson.edu
	Makarand Risbud, PhD Co-Directors	501 College 215-503-3458 Makarand.Risbud@jefferson.edu
Genetics, Genomics & Cancer Biology (GGCB)	Lucia Languino, PhD	506 BLSB 215-503-3442 Lucia.Languino@jefferson.edu
Immunology & Microbial Pathogenesis (IMP)	Fabienne Paumet, PhD	750 BLSB 215-503-8567 Fabienne.Paumet@jefferson.edu
	Christopher Snyder, PhD Co-directors	526 BLSB 215-503-2543 Christopher.Snyder@jefferson.edu
Neuroscience (NS)	Kyunghee Koh, PhD	Suite 410 JHN 215-955-5905 Kyunghee.Koh@jefferson.edu
	Angelo Lepore, PhD Co-Directors	245 BLSB 215-503-5864 Angelo.Lepore@jefferson.edu
Integrative Physiology (INPS)	Lawrence Goldfinger, PhD	Suite 394 JAH 215-955-5324 Lawrence.Goldfinger@jefferson.edu

X. PhD Program Requirements for MD/PhD Students

The PhD degree requires the completion of 180 credits: 54 topical course credits including 18 outside the chosen program with the remainder being research credits. Because of credit transfer from SKMC and graduate credits earned during SKMC years 1 and 2 MD/PhD students usually easily fulfill minimal credit requirements. Contact your Program Director (listed above) for specific Program Requirements for MD/PhD students. Admission to PhD

candidacy requires successful completion of a Comprehensive Examination. The Thesis Defense requires a written thesis and both a public and private defense of the thesis.



APPENDIX B: MD/PhD PROGRAM SPECIFIC REQUIREMENTS BY YEAR

<p>YEAR 1 JeffMD Phase 1</p>	<ul style="list-style-type: none"> • Summer Research Rotations - Must be completed in the summer prior to Orientation for JeffMD Phase 1 Year 1 and the summer prior to JeffMD Phase 1 Year 2. Two 8 week research rotations are required. • MD/PhD Orientation and Welcome Barbecue • Attend Current Topics in Translational Biomedical Research, Wednesdays, 5pm as scheduled <ul style="list-style-type: none"> ○ Student Research Seminar ○ Case Study in Molecular Medicine ○ Translational Research Journal Club • MD/PhD Retreat – usually October, Saturday all day • Physician Scientist Dinners
<p>YEAR 2 JeffMD Phase 1</p>	<ul style="list-style-type: none"> • Complete second 8 week research rotation prior to Orientation for JeffMD Phase 1, Year 2. • MD/PhD Orientation and Welcome Barbecue • Attend Current Topics in Translational Biomedical Research until beginning of USMLE Step 1 Review Period, usually mid-February <ul style="list-style-type: none"> ○ Student Research Seminar Wednesday, 5 pm ○ Case Study in Molecular Medicine –Wednesday, 5pm ○ Translational Research Journal Club –Wednesday, 5 pm • MD/PhD Retreat – usually October, Saturday all day • Physician Scientist Dinners • Successfully complete USMLE Step 1 before the end of the USMLE Step 1 Review Period and beginning of JeffMD Phase 2, usually mid-April. • Identify Thesis Research Mentor and PhD Program
<p>YEARS 3 – 6 JCLS Graduate school 1 - 4</p>	<ul style="list-style-type: none"> • Continue attendance at weekly meetings of Current Topics in Translational Biomedical Research each semester/session; register for GC 710 (Fall) and 712 (Spring), 1 credit each semester. • Attend Welcome Barbecue • Attend Annual Retreat • Attend Physician Scientist Dinners • Register and participate as appropriate in GC 725 Enrichment Course in Clinical Skill Fall 1st year. Optional each semester after (1 credit each semester registered). • Form research committee, including one ex-officio MD/PhD co-Director • Submit application for Ruth L. Kirschstein Individual Predoctoral National Research Service Award Fellowship (F30 for MD/PhD, preferred, or F31 for PhD or equivalent). • Attend Ethics Case Conferences once a month during third year of PhD studies (fifth year in MD/PhD Program) • Optional GC 630 - Fundamentals of Clinical Trials • Optional Rotation on the Cancer Clinical Research Review Committee • Optional Rotation at Annals of Internal Medicine • Successfully complete all PhD requirements as set forth by the selected PhD Program including <ul style="list-style-type: none"> ○ required coursework ○ regular research committee meetings ○ comprehensive examination • Have at least 1 first author paper accepted for publication
<p>YEARS 7 – 8 JeffMD Phase 2 and 3</p>	<ul style="list-style-type: none"> • Present one Clinical Case Study in Molecular Medicine each year • Continue weekly attendance at Current Topics in Translational Biomedical Research as clinical schedule allows. • Attend Welcome Barbecue • Attend Annual Retreat. If unable to attend due to a professional conflict, notify the Administrative Director in advance. • Successfully complete SKMC requirements

APPENDIX C: SCHOLARLY INQUIRY FOR MD/PhD STUDENTS

The Sidney Kimmel Medical College and the College of Life Sciences jointly sponsor a program for the training of medical scientists that requires approximately eight years of study and leads to both the MD and PhD degrees. During the initial two years, the students complete Phase 1 of the SKMC JeffMD curriculum, and spend the summer months in laboratory rotations to explore potential sites for their future thesis research. The following years are devoted mainly to completing graduate-level coursework, conducting an original research project in the laboratory of a faculty advisor, and writing a thesis for the PhD degree. The students then complete the courses and clerkships of Phases 2 and 3 of the SKMC JeffMD curriculum.

MD/PhD students in the basic sciences typically choose the SI/CTR track, since that track naturally aligns with their fields (in principle, any SI track may be selected, but such choice may entail additional work, since the PhD-related basic science research may not fulfill other tracks' requirements). Dr. Walter Kraft is the designated faculty supervisor of the MD/PhD students in the SI/CTR track. MD/PhD students may use research activities and deliverables from their PhD program to satisfy certain Scholarly Inquiry requirements, as outlined below.

Phase 1 – MS1 (Blocks 1-4)

- **SI common curriculum.** MD/PhD students are expected to complete the same requirements that apply to the MD students, i.e., clearances and trainings, common curriculum lectures/events, and the common curriculum exam.
- **SI track selection.** MD/PhD students are expected to select a SI track by the same date as the MD students.
- **SI track activities.** MD/PhD students are expected to attend lectures/workshops and complete any assignments in their selected track, just like the MD students in the track.
- **SI project & advisor.** MD/PhD students are expected to specify a research topic and advisor by the same date as the MD students in the track, and then write and present a project proposal. MD/PhD students may use their upcoming summer rotation to fulfill these requirements, i.e., their specified project may be their planned summer rotation, their advisor the rotation's PI, and their proposal based on the summer rotation plans.

Phase 1 – MS2 (Blocks 5-8)

- **SI track activities.** MD/PhD students are expected to attend lectures/workshops and complete any assignments in their selected track, just like the MD students in the track. **SI oral progress report. MD/PhD students must prepare and deliver an oral progress report of their work, just like the MD students. The oral presentation may be based on their summer rotation work.**
- **SI abstract.** MD/PhD students may use the required summary form after their summer rotation to fulfill the SI abstract requirement (submitted via Examsoft).
- **SI poster presentation.** MD/PhD students may use a poster presentation at the MD/PhD retreat to satisfy the SI poster requirement. Successful completion of this poster presentation must be attested by a SI-designated faculty member.

Phase 2 – MS3

- The MD/PhD students are expected to attend sessions and check-ins, complete assignments, and develop a research portfolio, just like the MD students in their track. However, the MD/PhD students are expected to use their PhD work to satisfy project-related requirements and as part of their portfolio.

- The **first deliverable** entails writing a project's specific aims in NIH grant application format. MD/PhD students may use the specific aims of their thesis work (or those of a specific paper deriving from it) to satisfy this SI assignment.
- The **second deliverable** expands on the first deliverable and entails an oral presentation of a project's specific aims, methods, and anticipated results. MD/PhD students may use an oral presentation at the MD/PhD retreat or in the "Case Studies in Molecular Medicine" seminar series or some other pre-approved venue to satisfy this SI assignment (successful completion must be attested by a SI-designated faculty member).

Phase 3 – MS4

- The MD/PhD students are expected to attend track sessions, complete assignments, and finalize a research portfolio, just like the MD students in their track. The MD/PhD students may use their PhD work to satisfy requirements and as part of their portfolio. For example, activities that can count towards the fulfillment of requirements include presenting at a conference, writing a manuscript, conducting original research extending the thesis work, preparing a grant submission, etc.

JeffMD: SI Clinical & Translational Research Track – MD/PhD Phase-2 Oral Presentation: Case Studies in Molecular Medicine

Criteria	Outstanding (3 Points)	Satisfactory (2 Points)	Unsatisfactory (0 Points)
Background and Rationale (20%). Epidemiology and natural history of underlying disease.	Describes importance and significance of the topic. Connects the subject and background to the case review purpose in an organized, specific, and concise manner.	Description of importance and significance is vague. Organization is occasionally unclear. Attempts to connect to the literature.	Lacks organization or specific details. Tenuous or no connection to literature. Lacks understanding of underlying clinical condition.
Question being addressed (25%). Description of importance and current understanding of the mechanistic basis for pathophysiology. Listing of specific gaps in the field to be addressed.	State of the art is clearly described. Goals and objectives are well articulated and supported. Work is clear, concise, and relevant, utilizing field appropriate terminology.	Goals and objectives are present and largely supported by logical rationale, but are disorganized, incomplete, or lacking specifics. Gaps are partially explored.	Unclear or contains irrelevant information. Description of goals and objectives is absent, or present but lacking rationale. Gaps are absent, or inaccurately outlined.
Methods (15%). Description of methods/techniques that have been or can be translated into clinical application. Sources and level of evidence for current understanding outlined.	Description of methods is complete, organized, specific, and concise. The quality of evidence and sources of information are clear.	Methods are described, but description is disorganized or incomplete, or lacking specifics. The quality of evidence and sources of information are stated but unclear.	Methods are not presented or are presented inaccurately. The quality of evidence and sources of information are not mentioned.
Results and Conclusions (25%). Discussion of results and implications regarding current and future therapeutics for the disease.	States main results in an organized, specific, and concise manner. Discusses all major implications regarding the results' translation.	Partially states results, and/or discussion is disorganized or lacks specifics. States some implications regarding the results' translation.	States no results or implications regarding their translation.
Slides and Delivery (15%). Visual appeal of slides (formatting, organization, pictures/tables/graphs) . Clarity & coherence of oral presentation, and engagement with audience. Disclosures & acknowledgments.	Contains effective visual aids. Information is presented in a logical sequence. Text is readable, clear, and of appropriate length. Speaker uses a clear audible voice and maintains consistent eye contact with audience. Coherent, clear, and concise answers to questions regarding presented work. Presentation is within time limits, very engaging, and includes effective transitions. Has a clear title reflecting the presented work Lists all authors, and indicates advisor. Disclosures/acknowledgments present.	Contains at least one visual aid. Information is presented in a fairly logical sequence. Text is mostly (but not always) readable, clear, and of appropriate length. Speaker uses clear audible voice and maintains some eye contact. Answers address questions posed, but may be somewhat disorganized or unclear. Presentation is within time limits and somewhat engaging; transitions are not always smooth. Incomplete listing of title/authors/advisor. Disclosures/acknowledgments present.	No visual aids. No clear organization. Text is often unreadable, unclear, or too long. Speaker is difficult to understand and/or speech is interrupted by marked reliance upon notes. Answers do not address questions posed, or lack logic and coherence. Presentation is too long or too short, or is difficult to follow. Absent title, authors, and advisor. No disclosures/acknowledgments .

**APPENDIX D: RESEARCH ROTATION REPORT FORM
Synopsis of Research Performed During Summer Lab Rotation**

Name of Student: _____

Period of Rotation: _____

Name of Preceptor: _____

1=Excellent 2=Acceptable 3=Below Expectations

1.
 - a) Effort during rotation period _____
 - b) Ability to organize available time _____
 - c) Ability to conceptually grasp the aims of the rotation _____
 - d) Ability to learn methods _____
 - e) Experimental precision and accuracy _____
 - f) Ability to interpret results _____
 - g) Ability to amicably work alongside others in laboratory _____
 - h) Success in achieving and completing goals set for rotation _____

2. Overall prediction of this student's potential to do independent research.

3. Please list in order of importance your opinion of this student's greatest strengths and weaknesses.

4. Final Grade (Satisfactory / Unsatisfactory): _____

Signature: _____

Insert confirmation of Thesis Advisor and PhD Program Director here in PDF

APPENDIX G: CURRENT TOPICS IN TRANSLATIONAL BIOMEDICAL RESEARCH

GC 710, 712- Current Topics in Translational Biomedical Research I, II - 1 credit each

Course Coordinators: Dr. Waldman, Dr. Covarrubias

The course meets three or four weeks per month during each session: Fall and Spring on Wednesdays at 5 pm.

Course Components and Schedule:

Progress in Translational Research Seminar

Allows students to present the results of their ongoing thesis research. Research presentations highlight the translational applications of the research that will solve a clinical problem, impact patient care, or prevent disease in individual patients or populations.

Case Studies in Molecular Medicine

Provides concrete case studies in which novel molecular concepts are applied to the development of new diagnostic and therapeutic modalities for patient management. This program challenges trainees to think critically about the realistic and practical applications of laboratory-based discoveries and provides a context for the processes, steps and timelines required for translation from bench to bedside.

Ethics Case Conference – 4th Tuesday; 12-1 PM - Required while in JCLS 3 (year 5 of MD/PhD Program)

MD/PhD trainees participate in a monthly conference that focuses on ethical issues in research and medicine. The format for these conferences is small group discussion and case-based. Faculty and trainees select pre-reviewed case studies from the literature that form the focus for directed discussion at the conference. The specific focus of these conferences is experimental research ethics. Faculty mentors provide guidance in the development of the presentation and provide trainees with constructive criticism.

Translational Research Journal Club

Provides opportunities for students in the MD/PhD program to read, interpret, synthesize, and present literature in translational science to peers and faculty. The journal topics specifically focus on translational research appearing in the highest impact scientific journals.

Evaluation: Students are evaluated for attendance, participation and presentation skills. Grading is Satisfactory / Unsatisfactory.

APPENDIX I: POLICY FOR MD/PhD STUDENT TRANSITIONS

The Jefferson MD/PhD program includes two major transition points between Sidney Kimmel Medical College and the Jefferson College of Life Sciences. The first occurs when students complete year JeffMD Phase 1, including completion of Step 1, and take leave of absence from SKMC to pursue their four years of graduate study and associated research. The second occurs when students complete their thesis research and return to SKMC for JeffMD Phase 2.

SKMC to JCLS

- The end of Block 8, Phase 1 signals the beginning of the USMLE Step 1 Review Period and end of JeffMD Phase 1
 - Students are not required to attend Current Topics in Translational Research during this period, but are welcome to do so.
- Academics
 - Students must successfully complete USMLE Step 1 prior to start of JeffMD Phase 2 Transition to Clerkships Intersession.
 - Students will join JCLS on the day that JeffMD Phase 2 Transition to Clerkships Intersession begins
 - Will register for GC 920, Research, using paper registration through MD/PhD office
 - Will resume participation in MD/PhD Curriculum
 - Students will declare mentor and PhD Program no later than the beginning of the Fall Semester, unless requiring an additional rotation

JCLS to SKMC

- All MD/PhD students returning to the clinical curriculum must enter JeffMD Phase 2 in April of their returning year.
- As a result, MD/PhD students returning to medical school in April must complete their thesis defenses no later than six weeks prior to the start of Phase 2 Orientation. This deadline will allow MD/PhD students sufficient time to complete and finalize all thesis revisions prior to their return to SKMC full-time. There are no exceptions to this requirement. If MD/PhD students are not able to complete their PhD work under this new deadline, they will be required to delay returning for an additional calendar year.
- The **structured re-immersion program** will take place prior to the start of Phase 2.
- During the final year of medical school (JeffMD Phase 3), students will have increased elective time. MD/PhD students may use some of this time to complete additional lab work, including follow-up experiments, paper revisions, or new paper submissions.

Return to SKMC 3

To: MD/PhD Program

Name: _____

PhD Program: _____

_____ I plan to return to SKMC for JeffMD Phase 2 in April. I understand that in order to do so I must:

- Complete my thesis defense and all associated requirements, including thesis revisions, no later than six weeks prior to the start of Phase II of the academic year in which I wish to return (March 1st for an April 11th return date)
- Participate in the mandatory structured clinical re-immersion program provided by SKMC prior to Phase 2

_____ I request an additional year to complete my PhD studies. Please explain reason(s) for extension here.

Signature of Student

Date

Signature of Research Advisor

Date

Printed Name of Research Advisor

APPENDIX J: ANNALS OF INTERNAL MEDICINE ROTATION

Annals of Internal Medicine Rotation (Optional) K30 Training Program in Human Investigation

Introduction:

The Annals of Internal Medicine is the flagship publication of the Philadelphia-based American College of Physicians. It is considered the premiere worldwide internal medicine journal. . Editor in Chief **Christine Laine, MD, MPH**, a faculty member at Jefferson, has offered members of the MD/PhD program unprecedented access to the editorial process through a 4-week rotation. Enrollees can participate in the weekly editorial and statistical meetings of the journal. Maximal benefit of the rotation is obtained when participants read a majority of the articles being discussed. *Therefore, participants should schedule the rotation during a period when they*

have the time to devote to preparation for each session. Time periods with heavy clinical or administrative activities do not provide the time to maximize the benefit of each meeting.

Rotation Coordinators:

Thomas Jefferson University
Walter Kraft, MD
1170 Main, 132 S. 10th St, Philadelphia, PA
215 955 9077 walter.kraft@jefferson.edu

Annals of Internal Medicine
Christine Laine, MD, MPH
215 351.2527 claine@mail.acponline.org

Administrative Assistants:
Suzanne Flint
SFlint@mail.acponline.org

Robert Blackwell
rblackwell@acponline.org

Managing Editor
Mary Beth Schaeffer
mschaeffer@acponline.org

Rotation Goals:

Participants will:

- Observe and participate in the editorial process of a major medical journal
- Understand the accepted statistical standards for high quality clinical research
- Incorporate the critical assessment of research observed in the editorial process to their personal research projects

Duration:

4 weeks

Meeting Times:

Editorial Meetings: Every Thursday, 4-6 PM
Statistical Meetings: 3-4 PM, prior to each editorial meeting.

Location:

ACP
5th floor, 190 N. Independence Mall West, Philadelphia (at the corner of 6th and Race St, which is a 10 minute walk from the Jefferson Medical College Campus)

Prerequisites:

Participants should have completed GC 660, Statistical Methods of Data Analysis (or equivalent). Completion of track courses in Epidemiology (GC 655) or Clinical Trial design (GC 630) is helpful, but not required.

Reference Texts:

The following resources will be available for loan from the Division of Clinical Pharmacology:

Lang TA, Secic M. *How to Report Statistics in Medicine*. Philadelphia, American College of Physicians; 2nd ed.

Guyatt G, Rennie D, Ed. "Users Guide to the medical literature", Chicago, AMA Press

Rotation Guidelines:

Editorial Process at the Annals

Articles submitted for publication in the Annals are first screened by one of three deputy editors. Articles felt to be candidates for publication are sent to outside reviewers for comments. Articles with the reviewer comments are distributed to the associate editors one week before meetings. The associate editors each have a specific area of expertise. An associate editor is asked by the deputy editors to serve as a primary reviewer for each manuscript presented to the group.

After discussion during the editorial meetings, the Editor meets with the deputy editors to decide the fate of each of the articles.

Following editorial review, some articles are also evaluated for statistical validity at a statistical meeting held Thursdays at 3 PM.

Scope of Participation

Participants are expected to read most of the articles prior to each meeting. Individuals with germane expertise can participate in the discussions of a manuscript. In addition, participants should use the reference texts to review topics discussed at the editorial meetings. Participants should provide a short written evaluation of the rotation during the feedback session with the course coordinator.

Annals format

Participants should read a few of the last issues of the Annals to get an idea of focus of the journal and familiarity with the following types of articles:

- Systematic reviews
- Policy positions
- Original articles
- Brief communications
- Updates
- Academia and Clinic

Scott Library has a subscription to the Annals. The Division of Clinical Pharmacology has back issues of the Annals available for use, as well as access to PDF files from the excellent web site www.annals.org.

Obtaining Manuscripts

Manuscripts are delivered by courier the week of the editorial meeting.

Securing Access to the ACP Building

All visitors to the ACP should bring a form of identification and will need to obtain a building pass. Prior to the orientation session with Dr. Laine, participants should confirm that the front desk has their name as an expected guest.

Schedule

Week		Suggested Activities
1	Orientation at ACP	<ul style="list-style-type: none"> • 2:30 PM- Meet with Dr. Laine; obtain temporary pass • 3:00 PM- Attend statistical meeting • 4-6 PM- Attend Editorial meeting • 6-6:30 PM- Attend meeting with Editor and deputy editors
2	Editorial Meeting	<ul style="list-style-type: none"> • 4-6 PM- Attend Editorial meeting • 6-6:30 PM- Attend meeting with Editor and deputy editors
3	Editorial Meeting	<ul style="list-style-type: none"> • Write editorial review of a manuscript prior to meeting • 4-6 PM- Attend Editorial meeting • 6-6:30 PM- Attend meeting with Editor and deputy editors
4	Final meeting and feedback	<ul style="list-style-type: none"> • Write editorial review of a manuscript prior to meeting • 4-6 PM- Attend Editorial meeting • 6-6:30 PM- Attend meeting with Editor and deputy editors and final feedback • Provide feedback to Walter Kraft