

Guidelines for the CWRU MSTP and CTSTP



**Medical Scientist
Training Program
Est. 1956
“Ex Scientia Rememdiu”**

MSTP Student Guidelines

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Welcome

Welcome to MD-PhD training in the CWRU MSTP/CTSTP. Our MSTP and CTSTP are outstanding programs. We can be quite proud of the accomplishments of our students, the efforts of our faculty, and the collaboration of our institutions, which together have enabled these strong programs. We hope this document will serve as a useful guide to our program. If more information is needed, please contact mstp@case.edu.

Sincerely,

Derek Abbott, Director
Cliff Harding, Co-Director
Agata Exner, Associate Director
Diane Dowd, Administrative Director
Crista Moeller, Program Coordinator
Jane Vogelsberger, Program Assistant

Overview

The MSTP includes three major phases of training that integrate research and clinical training:

1. During the first two years, students complete the first two years of the [medical school curriculum](#) (M1 and M2, including early clinical experiences), do two – three research rotations, take graduate courses, and choose their PhD graduate program and thesis lab. In the first summer, students start medical school classes and complete the Intro to MSTP course. The first research rotation is done in the fall semester of M1. An additional one or two research rotations are done during the summer between M1 and M2. Research rotations may also be done during the spring semester of M1 and the fall semester of M2. Students take graduate courses in the semesters that they are not doing research rotations.
2. During the PhD thesis phase, students complete all requirements of their PhD thesis program. They also participate in the MSTP Clinical Tutorial, which is longitudinally integrated into their research time.
3. The final phase is the last two years of the medical school curriculum (M3 and M4). The focus here is clinical training, but research electives can be taken for part of M4.

Although each of these three phases has a different focus, there is opportunity for students to pursue both research and clinical training in each phase. An important feature of the CWRU MSTP is the integration of scientific and clinical training (e.g. graduate courses in the MD phase and MSTP Clinical Tutorial during the PhD phase).

Schedule of Courses

Each semester at the time of registration, all first and second year MSTP students must consult with Director Dr. Derek Abbott or Associate Director Dr. Agata Exner on course selection and/or rotations. Approval for the academic plan must be obtained each semester. Courses outside of those relevant to the MSTP (e.g. dance or music classes) may be taken only if they will not interfere with fulfillment of MSTP requirements, and the MSTP cannot provide tuition support for such classes.

During fall and spring semesters of year 1 and the fall semester of year 2, MSTP students are graded for graduate courses that represent components of the MD curriculum (IBIS 401, 402, 403, 411, 412 and 413). These grades are for graduate school purposes and do not affect standing in the medical school. This system provides the benefit of graded course credits that can be used toward the PhD degree. During these semesters, additional credits are added for other graduate courses and

research rotations as selected by the student and approved by the Director or Associate Director. Students MUST take a graduate course (3 or 4 credits) or MSTP 400 (3 credits) in each of these semesters.

A summary of a typical course sequence is provided in the following table.

Table 1. Graduate School Course Components of the Case MSTP: A Typical Course Schedule			
Semester	Course	Graduate School Credit Hours	Graded (G) or Pass/Fail (P/F)
Year 1 Summer	MSTP 401 Intro to MSTP	0	P/F
Year 1 Fall (M1)	IBIS 401	4	G
Year 1 Fall	IBIS 411	2	G
Year 1 Fall- CHOOSE ONE	Grad course	3-4	G
	MSTP 400	3	P/F
Year 1 Fall	Total	9	
Year 1 Spring	IBIS 402	4	G
Year 1 Spring	IBIS 412	2	G
Year 1 Spring- CHOOSE ONE	Grad course <i>OR</i>	3-4	G
	MSTP 400	3	P/F
Year 1 Spring	Total	9-10	
Summer	MSTP 400	0	P/F
Summer	Total	0	
Year 2 Fall (M2)	IBIS 403	4	G
Year 2 Fall	IBIS 413	2	G
Year 2 Fall- CHOOSE ONE	Grad course <i>OR</i>	3-4	G
	MSTP 400	3 (Start in PhD lab if possible)	P/F
Year 2 Fall	Total	9-10	
Year 2 Spring overview: Start graduate course in mid-January Finish MD classes by end of February. Spend 6-8 weeks to study and take USMLE Board part I. The maximum allowable period for completing this exam is 8 weeks after completion of the last M2 exam. Start full-time in laboratory research around May 1. (Exact date varies by year.) Complete graduate course, early May.			
Year 2 Spring	Grad course	3-4 (as indicated by graduate program)	G
Year 2 Spring	**** 601	5-6 (as indicated by graduate program)	P/F
Year 2 Spring	Total	9	

Summer	Total	0	
Year 3 Fall (G1)	Grad course(s)	(as indicated by graduate program)	G
Year 3 Fall	**** 601	(as indicated by graduate program)	P/F
Year 3 Fall	IBMS 450 Biostatistics	1	
Year 3 Fall	Total	9	
Year 3 Spring	Grad course(s)	(as indicated by graduate program)	G
Year 3 Spring	**** 601	(as indicated by graduate program)	P/F
Year 3 Spring	IBMS 500 On Being a Professional Scientist	1	P/F
Year 3 Spring	Total	9	
Complete qualifying examinations and thesis proposal by summer following year 3 (BME requirements different, see graduate program guidelines)			
Summer	Total	0	
Year 4 Fall (G2)	Grad course(s)	(as indicated by graduate program)	G
Year 4 Fall	**** 701	(as indicated by graduate program)	P/F
Year 4 Fall (take at least 1 year in a patient- based specialty)	MSTP Clinical Tutorial/CPCP	0 (2 weeks credit for 4 th year MD clinical elective if entire year is completed; can also be used concurrently for CPCP credit in Med curriculum)	Not graded for Clinical Tutorial; Meets/DNM for CPCP credit
Year 4 Fall	Total	9	
Year 4 Spring	Grad course(s)	(as indicated by graduate program)	G
Year 4 Spring	**** 701	(as indicated by graduate program)	P/F
Year 4 Spring (take at least 1 year in a patient- based specialty)	MSTP Clinical Tutorial/ CPCP	0 (2 weeks credit for 4 th year MD clinical elective if entire year is completed; can also be used concurrently for CPCP credit in Med curriculum)	Not graded for Clinical Tutorial; Meets/DNM for CPCP credit
Year 4 Spring	Total	9	

Year 5 Fall (G3)	Grad course(s)	(as indicated by graduate program)	G
Year 5 Fall	**** 701	(as indicated by graduate program)	P/F
Year 5 Fall (at least 1 year in a patient- based specialty)	MSTP Clinical Tutorial	0 (2 weeks credit for 4 th year MD clinical elective if entire year is completed)	Not graded
Year 5 Fall	Meet with Society Dean	Starting in PhD year 3, if students are within a year of re-entry to medical school, students should meet with their Society Dean and an MSTP Director/Co-Director to plan PhD to M3/M4 transition	
Year 5 Fall	Total	9	
Year 5 Spring	Grad course(s)	(as indicated by graduate program)	G
Year 5 Spring	**** 701	(as indicated by graduate program)	P/F
Year 5 Spring (take at least 1 year in a patient-based specialty)	MSTP Clinical Tutorial	0 (2 weeks credit for 4 th year MD clinical elective if entire year is completed)	Not graded
Year 5 Spring	IBMS 501 RCR + 4	0 credits. The Spring semester before beginning M3, MSTP students are required to take additional training in Responsible Conduct of Research designed to meet NIH requirements	P/F
Year 5 Spring	Total	9	
Additional PhD phase year if necessary- schedule as for Year 5			
All PhD requirements, including publication requirement and thesis dissertation defense, must be completed before starting M3.			
Year 6 (M3) Begin early July or early October	3rd year medical curriculum (registered as MD student, no graduate school credit)		MD program clerkship evaluations
Year 7 (M4) End in early May	4th year medical curriculum (registered as MD student, no graduate school credit)		MD program clerkship evaluations

Notes:

- Schedules may vary with different students and different graduate programs.
- MSTP students are registered as graduate students in all phases except the last two years (M3-M4).
- MSTP 400 is the course number for Research Rotations. **MSTP students are required to rotate in a minimum of 3 different laboratories by the end of fall semester of year 2.**
- In addition to coursework for the MD program, students must take a rotation or graduate course each semester through the fall semester of year 2.
- IBIS 401-403 are the core biomedical course components of the first two years of the MD curriculum, and IBIS 411-413 provide the clinical training in years 1 and 2.
- Later years in PhD phase resemble year 4. Coursework is usually finished so that all time may be spent on 701 Dissertation Research.
- Students must satisfy all qualifying examination and thesis proposal requirements of the graduate program to advance to candidacy for the PhD degree before registering for 701 Dissertation Research. A total of 18 credits of 701 is required. When possible, students should register for less than 9 credits per semester to avoid taking more than 18 total credits of 701.
- The thesis defense must be scheduled well in advance with the School of Graduate Studies to meet requirements. After completion of the PhD phase, students enter M3 and are no longer registered as graduate students.
- Before starting M3:
 - Students must complete all PhD requirements, including the publication requirement and thesis dissertation defense. The School of Medicine Registrar will not schedule MSTP students for clinical rotations until Drs. Abbott, Harding, or Exner have confirmed that the PhD requirements are completed. See the [Return to M3 To-Do List](#).
 - Students must complete Clinical Tutorial and CPCP requirements.
 - Students must schedule a meeting with their Society Dean, graduate mentor, and MSTP advisor in the fall semester of the year prior to entry, to discuss process for entry into M3.
- Students may start the core curriculum for M3 in early July, September, or October, in accordance with the clinical rotation calendar. Starting by early September preserves flexible time for residency interviews in M4 to a degree similar to that experienced by straight MD students; starting in early October will make time for residency interviewing tighter. Further flexibility in the start date for clinical training may be obtained by scheduling a clinical elective prior to the first core clerkship; this may allow a start in clinical training some weeks before the dates mentioned above.
- Maximum and minimum periods of clinical training: _The July start date allows completion of the full maximum amount of clerkships, including the required minimum of clinical clerkships plus additional electives that may be spent in either clinical electives or research. The October start date reduces elective time but allows all requirements to be met. This is possible because MSTP students receive 4 months credit toward M4 research electives from their PhD work. Students starting M3 in July-October of year "X" graduate in May of year "X+2". MSTP students are not permitted to start M3 in March.
- Continuing Instruction in Responsible Conduct of Research (RCR + 4): The NIH expects all trainees funded by T32, F30 or other training grant mechanisms (i.e. ALL MSTP students) to receive ongoing training in responsible conduct of research BEYOND IBMS 500. THIS IS AN

NIH REQUIREMENT FOR A STUDENT TO RECEIVE MSTP SUPPORT. The Spring semester before returning to Medical School all MSTP students are required to take IBMS 501, Responsible Conduct of Research for Advanced Trainees. This retrain experience is a requirement by the NIH and the SOM.

Program Administration

The MSTP is run by a collaboration of students, faculty and staff. The MSTP Council is a body of students that plans and runs certain aspects of the program and advises the Director on issues of concern to students. The Administrative Director (Diane Dowd), Program Coordinator (Crista Moeller) and Program Assistant (Jane Vogelsberger) manage many aspects of the program. They are often the first people who students contact for advice or help. Director Derek Abbott and Associate Director Agata Exner are the primary advisors for students in the first two years of the program. Program Director Derek Abbott is responsible for all aspects of the program and together with Co-Director Cliff Harding is available to advise students at any stage. The MSTP Steering Committee makes decisions on MSTP policy, planning, student admissions, mentor approval, and evaluation of students. The members of the Steering Committee are appointed by the Director and include representatives of major training programs affiliated with the MSTP (and CTSTP). The Steering Committee members are also advisors for MSTP students during the first two years and the PhD phase. A separate Advisory Board provides higher level review of the program and Director. The Director and Advisory Board report to the Dean of the School of Medicine.

Advising System

The Case MSTP has a “three-deep” advising system, meaning that there are at least three levels of advising resources in each of the major phases of the program.

Arrival Planning

A month or so prior to his/her arrival to CWRU, each new student will be contacted by Dr. Agata Exner or Dr. Derek Abbott, who will provide advice on research rotations and coursework. The MSTP office can provide advice to students who are planning a move to Cleveland.

First Two Years

Drs. Exner and Abbott are the primary advisors for students in the first two years of the program. They track student progress and advise each student on choice of rotation or graduate course for each semester. For detailed, field-specific questions, they may direct students to other MSTP Steering Committee members with expertise in specific scientific areas, and MSTP students are encouraged to contact Steering Committee members directly whenever their expertise and advice are needed- this is an expected part of their faculty contribution to the MSTP. For issues with the MD program, students also have their designated Society Dean as an advisor. The MSTP Co-Director, Dr. Clifford Harding, is also available to advise all students in any phase of the program.

PhD Phase

The primary advisor is the thesis mentor. Members of the student's thesis committee, which must include one of the PhD program representatives on the MSTP Steering Committee, are a second source of advice. For clinical curriculum planning and MSTP Clinical Tutorial during the PhD phase, students receive advice from Dr. Debra Leizman (Director of the MSTP Clinical Tutorial) and their Society Dean. The MSTP Director, Dr. Derek Abbott, follows each student's progress and is available to help whenever difficulties arise. In the fall of the final year of graduate training students must meet with their Society Dean, an MSTP Director/Co-Director, and their graduate

mentor to plan progress toward the start of M3.

Last Two Years

The primary advisor is the MD program Society Dean, who will advise on matters concerning the clinical curriculum and residency planning. Dr. Leizman, Dr. Abbott and Dr. Harding are additional sources of advice on these topics for MSTP students.

General Resources

The MSTP staff can provide contact information for all advisors; this information is also available on the MSTP website. The Medical School Registrar can provide valuable logistical advice and help to MSTP students, particularly as they plan their curriculum for M3 and M4.

Academic Requirements

The Case MSTP is designed to emphasize the interests of the students, and our goal is to provide maximum support for student success. If a student is having difficulty, our desire is to provide support and help to alleviate the situation. Students who are having difficulties are encouraged to consult one of the directors as soon as possible to obtain advice.

MSTP students must fulfill all academic requirements of both the medical and graduate schools as well as certain requirements that are specific to the MSTP. MSTP students are expected to achieve superior performance in medical school and graduate school. Students who make unsatisfactory progress must meet with their assigned director to discuss the situation and make plans for improvement of academic performance. The directors will try to help with counseling, advice on academic strategies and considerations for special circumstances. Students should be aware that significant academic underperformance will necessitate review of the student by the MSTP Steering Committee, with the student in attendance at the committee meeting. The Steering Committee will try to help the student overcome academic difficulty. However, significant academic underperformance may result in removal of a student from the MSTP (this requires a majority vote of the Steering Committee). If a student is removed from the MSTP, he/she may remain in medical school and/or graduate school if requirements for these schools are met, but without support from the MSTP.

Calendar/Vacations/Leave

Since students in the first two years are full members of the medical school class and also take graduate classes, they follow both the medical school and the graduate school calendars, which are not synchronized. School of Medicine classes start in early July, at which time students are registered for the summer semester in the graduate school. Fall semester for the graduate school starts in late August. For the spring semester, the MD curriculum commences in early January, and the graduate school semester begins in mid-January. Since the graduate and MD program calendars provide different options for vacation and holiday, MSTP students may determine the best time for vacation in their schedule, respecting their academic commitments, but vacation time is not to exceed the total of 2 weeks of vacation in addition to the 10 university and floating personal vacation days specified in the policy for CWRU graduate students (text below). Requests for exceptions for more extensive vacation or leave must be submitted to and approved by the Director or Steering Committee (as well as the PhD mentor during the PhD research years) and may require a leave of absence without stipend or benefits. Students should plan their vacation time to avoid disruption of training activities (e.g. courses, clinical commitments, research projects).

See the School of Graduate Studies [Policies and Procedures](#), and the School of Medicine [Student Handbook](#).

Planning for a Leave or Vacation

Details of health issues are confidential and do not need to be disclosed to the MSTP administration if privacy is desired, but it is best if students who anticipate necessity of a health, maternity or paternity leave discuss plans with the MSTP Director as far in advance as possible to facilitate planning. Individual considerations may include determining the impact of leave on progression through the MD curriculum, how to re-enter the curriculum, etc. As mentioned above, students on extended Leave might not be eligible for stipend support.

Policies for vacation, sick leave and parental leave for graduate students are governed by CWRU and School of Medicine policies. Trainees who receive full-support stipends from PhD programs are required to pursue their training on a full-time basis, devoting each day of the normal work week, plus any additional time required by their research projects and academic courses. To retain productivity and academic progress, it is strongly recommended that trainees enrolled in classes not take vacation while class is in session.

Students transitioning from M2 to the PhD thesis phase should note that there is no extra vacation time between the USMLE boards and the start in the PhD lab. If students want extra vacation time in this period they must request a leave of absence (without stipend support) in advance.

Vacation, Sick Leave and Parental Leave Policies

Holidays: Graduate students are entitled to observe all University closings for Holidays and other recognized events.

Vacations: Graduate students are allowed two weeks of vacation per calendar year (10 traditional work days) if they receive full support during a 12-month period. Students who receive less than 12 months of support are not entitled to vacation during the period of support. Vacation is not provided during the supported period when students receive support for part of the year. The dates of vacations must be approved in advance by the student's research mentor to ensure that time-sensitive work is not disrupted. Vacation days can be accrued from one year to the next year only with the prior written approval of the Program and only up to a maximum of 20 traditional work days, to allow for international travel, for example. There is no terminal leave. The times between academic terms and the summer are considered part of the active training period and are not to be regarded as vacation time.

Sick Leave: Graduate students are entitled to two weeks (10 traditional work days) of sick leave per year, with no year-to-year accrual. Sick leave may be used for medical conditions related to pregnancy and childbirth. Under exceptional circumstances, additional sick leave days may be granted following receipt of a written request from a physician, and prior written approval by the Program.

Parental Leave: Graduate students are entitled to paid parental leave for the adoption or birth of a child. The primary caregiver is entitled to 6 weeks leave and the other parent or domestic partner is entitled to 3 weeks leave. When both parents are supported graduate students, the leave may be used consecutively or together. The leave must be used within 12 months of birth or adoption. Parental leave must be approved in advance in writing by the Program. It is permissible to add parental leave and sick leave together for the adoption or birth of a child. The [Kirschstein NRSA grants policy](#) allows stipend for up to 60 calendar days of parental leave, "when individuals in comparable training positions at the sponsoring institutions have access to this level of paid leave for this purpose." Accordingly, training grants and fellowships will cover the period of parental leave allowed by CWRU.

Unpaid leave: Students who require additional leave beyond what is stipulated above must seek

prior written approval from MSTP, their current program, and the School of Graduate Studies for an unpaid leave of absence. Approval for a leave of absence must be requested in advance by the student and the student should provide documentation for the leave request and obtain approval. Conditions for the leave and approval must be submitted to the School of Graduate Studies. Continued coverage of health insurance is allowable as permitted within the guidelines of University Health Services and with written approval by the Program and School of Graduate Studies.

Unused Leave: A student is not entitled to receive any form of compensation for any unused holidays, vacation days, sick leave, parental leave, and/or other accrued time off.

Entering the Program

Incoming MSTP students are expected to enter the program on or about July 1. (The exact date may vary by a few days.) All students must be present in time to attend the MSTP summer retreat, followed by the start of medical school classes in early July. Incoming students are strongly encouraged to move to Cleveland a week or so before their start date.

MSTP office staff will be available to facilitate transition to the program. They will help newcomers with administrative requirements, including summer and fall registration, training grant appointments, and payroll enrollment. Information about practical necessities, such as housing, parking, laptop computer ordering, and health insurance coverage is available on the School of Medicine Accepted Central page. (A link will be provided to admitted students.)

The MSTP Summer Retreat, held in July, provides an important orientation to the program and includes sessions and workshops for program and professional development. Attendance is *required* for all students in the first two years and PhD phase, and is strongly encouraged for students in M3 and M4.

Dr. Abbott and Dr. Exner advise all students in the first two years and must approve selection of research rotations and graduate courses. All students *must* take a research rotation or a graduate course in each semester through the fall semester of year 2.

All students must take safety training classes provided by [the Environmental Health and Safety Department](#). These classes include Laboratory Standard Training, Biosafety, and others that may apply (e.g., Radiation Safety). These courses are in addition to the training received during medical school orientation. In some cases immunizations will be required for work with pathogens or human tissues or blood. Students using radioactive isotopes will need to obtain a radiation safety badge after successful completion of Radiation Training. Students cannot participate in lab work until all relevant training is obtained, and they must check with their rotation mentors to determine what safety training is required for that particular lab. Annual updates to training can be obtained online through the [EHS website](#).

Research Rotations

The principal goals for the research rotations are to provide a foundation for selection of a PhD thesis mentor and to provide exposure to a variety of research problems and laboratory techniques. While rotating, students should participate in all lab activities (research, lab meetings, journal clubs, seminars, etc.) to get an idea of what it will be like to be a member of the lab. During a research rotation a student should work on a substantive project and ideally should aspire to generate publishable data. The student and rotation mentor should discuss the student's time commitment before beginning the rotation and design a rotation project of appropriate scope.

All students must complete research rotations with three different MSTP-approved mentors by the fall

semester of the second year and submit rotation reports and rotation evaluations for each to the MSTP office. The duration of each rotation should be 4-6 weeks full-time or 8-12 weeks part-time during the academic year. Students may choose to do longer rotations if they desire.

Choosing a rotation mentor: The mentors list on the MSTP website provides links to faculty web pages. Students are encouraged to use this list as a starting point for rotation selection. Students should choose mentors who indicate potential availability of a slot in their laboratory at the projected time of PhD study. Students may request to have a new mentor added to the MSTP-approved list, but such requests must be communicated to Dr. Exner or Dr. Abbott far in advance to allow time for MSTP Steering Committee review of the proposed mentor. This system is designed to insure that rotation time is spent in laboratories that are suitable for PhD study.

Sources of information for choosing a rotation mentor include MSTP advisors (Dr. Exner, Dr. Abbott, Dr. Harding, MSTP Steering Committee members), the MSTP website and linked faculty web pages, student and faculty presentations at MSTP retreats, Lepow Medical Student Research Day and Graduate Student Research Day. In addition, the graduate programs have orientation sessions in the fall to provide an opportunity for BSTP and MSTP students to meet faculty.

If a student identifies his/her PhD thesis mentor after one or two rotations, he/she should still complete rotations with three different mentors to obtain additional research and technical expertise, and to provide alternatives should interests or circumstances change.

One of the MSTP Directors must approve all rotations, but arrangements for research rotations are made between the student and the faculty mentor. Students are encouraged to discuss potential rotation placements with Dr. Exner or Dr. Abbott and seek additional advice from Dr. Harding or appropriate MSTP Steering Committee members.

Rotation reports and evaluations: At the end of each rotation students are required to write a short rotation report and meet with the mentor to complete the rotation evaluation form. The report and evaluation should be emailed to the MSTP office (mstp@case.edu) within two weeks after the end of the rotation. The rotation report should be 2-3 double-spaced pages, or more as necessary, and should include the following:

- Abstract: Summarize the project results in approximately 100-200 words.
- Rationale: Outline the problem under investigation, describe what new information will be provided by the research, and indicate how this information will be useful.
- Methods and Results: Indicate the experimental approach, outline the procedures, present data and figures, and describe clearly how the data is analyzed.
- Discussion: Relate the results to the rationale for the research, existing literature and other pertinent information. Project any further experiments. Indicate what you learned from the rotation beyond simply the techniques that you mastered.
- Literature citations.

The Rotation Evaluation Form, including a sample report, is on the MSTP website, on the [Student Resources](#) page.

MSTP 400: MSTP students will register for zero credits of MSTP 400 for the summer term at the end of year 1. Students will register for 3-4 credits of MSTP 400 in fall and spring semesters in which they do a research rotation (which may occur in fall or spring of year 1, or fall of year 2).

MSTP 400 is graded Pass/Fail. The requirements of this course are completion of rotations on a schedule consistent with MSTP guidelines and the timely completion of rotation reports and evaluations. Reports and evaluations are due within two weeks after completion of the rotation, when the rotation experience is still fresh in the student's mind.

Choosing a Thesis Research Mentor

The choice of a research mentor is perhaps the most important decision of the student's first two years of medical school because the thesis laboratory is the setting for the most crucial learning experiences in the PhD years of the MSTP. Important factors include the quality of the projects underway in the laboratory, the level of the mentor's involvement, the character of the mentor's relationship with the student, and the influence of postdoctoral fellows and other students in the lab. These factors, combined with the student's own intelligence, determination, creativity, and initiative, will determine the success of the student's graduate education. It is important to emphasize that there is no absolute scale for rating such intangible factors about the research lab; rather, they must be considered in light of the distinctive features of the student's personality and the student's approach to experimentation and learning. For precisely this reason, our program emphasizes the role of research rotations as opportunities to sample several potential thesis labs.

MSTP-approved mentors are on the [Mentors List](#) on the MSTP website. To become an MSTP-approved mentor, a faculty member must be approved by the MSTP Steering Committee. The purpose of this requirement is to insure that students do their thesis research in active, productive laboratories that will provide an excellent training environment.

MSTP Mentors

There are two categories of MSTP mentors, senior mentors and initial mentors. Senior mentors must have membership in one of the MSTP-affiliated PhD training programs (see MSTP website), and a dynamic, high quality research program as evidenced by multiple factors, including grant funding and a significant record of publications (including publications with senior author status). They should be a principal investigator on one or more NIH research grants (R01 or equivalent) or other similar externally-funded peer-reviewed grants. Senior mentors must also have a good training record with prior PhD students, and resources and space for a PhD-phase MSTP student.

Initial mentors are promising young faculty with strong research track records who are new Assistant Professors and are not yet funded, or to faculty who are already funded but who have not yet trained a PhD student. At the time of approval, initial mentors will be required to identify a senior mentor who is willing in principle serve as a co-mentor for students placed in the initial mentor's lab. These co-mentors will be expected to actively co-mentor students and take significant responsibility for the training outcome of students. At the time of placement of a student, it will be possible to designate a new MSTP-approved co-mentor if existing co-mentors are not optimal matches for the student and project. The initial mentors will not be publicly identified as a separate set of mentors, but they and the MSTP Steering Committee will know that co-mentors are needed for placement in their labs. When initial mentors achieve the requirements for senior mentor status, their status will be changed to senior mentor.

Senior mentors may not have more than two MSTP students doing work in their lab. Initial mentors may not have more than one MSTP student doing PhD work in their lab. Mentors may appeal to the MSTP Steering Committee for permission to exceed these number by no more than one additional student; this may be approved if existing students are making good progress, nearing PhD completion, etc. After a lab is full, or commitments are made that will fill a lab, the mentor should *not* take rotating students until a student completes the PhD or an appeal to allow the one extra student is approved. Also, mentors should *not* take more than one new MSTP student into their lab within a single year. To prevent wasted rotation time, students should be aware of these rules and check to make sure that a slot is available in rotation labs.

Placement with a Mentor

Students should do a rotation with a prospective thesis mentor before making a commitment for PhD thesis placement with the mentor. Students should ask prospective rotation mentors whether they expect to have a slot available for a student at the expected start of the student's PhD phase

(this includes having a funding source for the student). A firm commitment may not be possible, since MSTP students have 1.5 years to select a laboratory, and projection that far in advance may be difficult. Therefore, it is crucial that students consult with potential mentors both before they rotate and again at the end of the rotation and within the year prior to initiating PhD thesis research. At the exit interview near the end of each rotation, the student and faculty member should have a forthright and frank discussion about the prospects for joining the lab. How interested is the student in the work in the lab? How willing is the advisor to have the student? These discussions may be tentative in character because the MSTP requires the student to continue with other rotations and the faculty member may want to remain available to supervise other rotating MSTP and BSTP students.

As the rotation process over the first two years continues, the views expressed initially at the exit interview with a potential mentor are likely to evolve. It is important that, as a student's interests become more focused on a particular faculty member, the faculty member be kept informed, so that s/he can respond appropriately both to that student and to any other students interested in that lab. Ultimately the selection of the thesis research advisor occurs primarily by negotiation between the student and mentor. Therefore, once an MSTP student has a serious interest in a lab, it is crucial that s/he discusses this with the potential PhD mentor. This lab selection must be mutually agreeable, and a commitment must be made for funding, space and resources to support the student. Final placement with a PhD mentor is subject to review by Drs. Abbott, Exner, and Harding, and the MSTP Steering Committee. Therefore, students are strongly advised to consult with MSTP advisors on a regular basis (before and after rotation).

When a student and mentor have decided to commit to one another, they should seek approval from the MSTP as early as possible. The MSTP will request updated funding, CV and training information from the PI, as well as completion of the mentor approval form (to be provided by the MSTP office). We encourage students to complete this as early as possible to secure commitments.

Individual Development Plans (IDP)

Students must prepare and submit an Individual Development Plan (IDP) each year. This is an NIH requirement for students supported on training grants. Students will work on their first IDP during the MSTP 401 course, in the M1 summer semester. See the [IDP Portal](#) for more information and submission instructions.

The First Two Years (M1/M2)

MSTP students are registered as graduate students and as medical students in the first two years. Each semester, students must register for their graduate courses by the School of Graduate Studies [registration deadline](#). See the Student Milestones page on the MSTP website. The Administrative Director will also send registration reminders and instructions, however the ultimate responsibility for registration is on the student. Late registration fees are the responsibility of the student. The directors will assist students in choosing appropriate graduate school courses. MSTP students are expected to take a graduate course or do a research rotation each semester. This is facilitated by flexible time in the afternoons of the University Program MD curriculum. There are, however, some afternoon activities for the MD curriculum, and MSTP students need to plan accordingly. Here is a list of activities that will require such planning. The major issue is resolving potential conflicts with the timing of a graduate course. If a student is doing a research rotation, laboratory activities should be scheduled around these events.

- Interprofessional Education (IPE). On designated Wednesday afternoons throughout the year. Students should determine the dates for IPE in advance to see if they conflict with a graduate course. If there is a conflict, it should be possible for a student to make up work for a single graduate course session in consultation with the course director. If sufficient advance notification of the IPE scheduling is not forthcoming, please contact Cliff or Derek to facilitate better advance notification.
- Clinical Immersion. One week during Block 4. The structure varies but are usually scheduled in half day segments (some may take only a couple of hours), and not all half days in the week may be utilized. Carol Chalkley in the Office of Curricular Affairs facilitates customized scheduling for dual degree students, including MSTPs, when needed to minimize conflicts.
- Foundations of Clinical Medicine (Block 8). Activities are scheduled approximately one afternoon per week, and they are frequently self-scheduled. MSTP students should strive to schedule activities on days which do not conflict with graduate courses. If necessary, the day of the week usually can be changed for MSTP students if needed to accommodate graduate course scheduling. Contact Jennifer Lennon in the Office of Curricular Affairs if this is needed.
- Afternoon reviews for the MD curriculum. These are generally videotaped. If there is a schedule conflict with a graduate course, students should attend the graduate course and view the videotaped review later.
- Lepow Medical Student Research Day
- Annual Stavitsky Lecture. First year students are required to attend this special lecture and associated events (e.g., poster sessions). The Assistant Dean for Medical Student Research (Dr. Colleen Croniger) is the point of contact for this lecture series.

Year 1, Summer Semester

In the first summer, students begin the MD curriculum in early July. They must also register for MSTP 401, Introduction to MSTP (0 credits), which will present a series of topics designed to help launch a successful MSTP research training trajectory leading to successful selection of a mentor and graduate program.

Because the medical and graduate school calendars do not synchronize, the content for IBIS 401, for which students register in the fall semester, includes parts of the MD curriculum in both the summer and fall.

Year 1, Fall and Spring Semesters

In the fall and spring semesters of M1, MSTP students register for 9 graduate credit hours/semester. See Table 1. The School of Medicine Registrar will register MSTP students for the appropriate medical school courses. Students are responsible for registering themselves in SIS for the graduate courses. Students do a research rotation in the fall semester to begin careful exploration of thesis mentor and project options. It is important that students devote substantial and conscientious effort to their research rotation. Most students will take a graduate course in the spring of M1.

Graduate Credits for Fall Semester, M1

IBIS 401: 4 credits (MD core curriculum blocks 1 and 2)

IBIS 411: 2 credits (MD clinical curriculum blocks 1 and 2)

MSTP 400 Research Rotation (3 credits). A research report must be completed at the end of the rotation.

Students in Biomedical Engineering, Population and Quantitative Health Sciences (Epidemiology) and Clinical Translational Science may have a slightly different order of rotations/courses and should consult their MSTP advisor (one of the Co-Directors) and a Steering Committee member in their program of interest.

Students should plan the sequence of their research rotations to complete at least 2 by end of the summer between M1-M2. *The goal is to select the thesis mentor by the beginning of fall semester M2.* Students may then take MSTP 400 in their PhD lab in the fall semester of M2 to start developing their PhD project.

Graduate Credits for Spring Semester, M1:

IBIS 402: 4 credits (MD core curriculum blocks 3 and 4)

IBIS 412: 2 credits (MD clinical curriculum (FCM/Block 8) in blocks 3 and 4)

A grad course (3 or 4 credits). Note: If a 4-credit grad course is taken, the student will be registered for 10 total hours for the semester, which is not a problem.

Students with interests in School of Medicine-based PhD programs (particularly those that participate in the BSTP for straight PhD students) are advised to take a graduate course in their prospective graduate program in the spring semester of year 1. These programs offer the foundation course that starts their graduate program sequence in the spring semester. It is important to complete such courses early if possible.

Year 2, Summer Semester

Students register for MSTP 400 (0 credits) for Research Rotations. Students may spend the entire summer in one lab or may do two shorter rotations. A rotation report must be completed at the end of each rotation

Students should identify their PhD mentor by the end of this summer semester.

Year 2, Fall Semester

MSTP students register for 9 graduate credit hours in addition to the registration through the medical school.

Graduate Credits for Fall Semester, M2

IBIS 403: 4 credits (MD core curriculum block 5)

IBIS 413: 2 credits (MD clinical curriculum block 5)

MSTP 400 Research Rotation in the lab of their PhD advisor (3 credits). Students should aim to define and launch their PhD project, setting the foundation for rapid progress the following spring semester. Alternatively, students may take a graduate course that is strategically important for advancement in their PhD curriculum.

Students are expected to do at least two lab rotations and choose their PhD lab placement by the beginning of the fall semester. In the event that a lab placement is not achieved on this timeline, the fall semester should include MSTP 400 devoted to an additional research rotation designed to finalize PhD lab placement.

Year 2, Spring Semester: Completion of M2 and Transition to PhD phase

A grad course in the PhD program selected by the student (3-4 credits).

XXX 601 Research in the student's chosen PhD program to complete a total of 9 graduate credits.

USMLE Boards part I (with 6-8 weeks off for studying and taking the boards).

Students are advised to take a graduate course in their prospective graduate program this semester, especially if they have not already completed the core courses for their PhD program. Most of the School of Medicine-based PhD programs that participate in the BSTP PhD core curriculum offer a graduate program-specific core course in the spring semester. It may be

important to take such a course to progress well in advanced coursework in later semesters. If a student has already taken this course in year 1, an advanced requirement or elective should be taken.

Timing of Events in Spring of Year 2

- Start graduate course in January
- Finish MD classes by late February/early March
- USMLE Board part I: maximum of 8 weeks off to study and take the exam; complete examination by the Saturday 8 weeks after the final Block 6 exam.
- Start full-time in graduate laboratory research *no later than the following Monday*.

Students must discuss timing of transition with their PhD mentor. To clarify these issues, the student, mentor and department chair/financial authority will all sign the MSTP Mentor Agreement form. A sample form is on the Resources, Links, and Forms page on the MSTP website.

Administrative acceptance of MSTP students into the PhD programs and their mentor's home departments will occur effective January. This is advantageous for accumulation of courses and credits towards the PhD degree. The tuition for this semester is shared by the PhD home department and the MSTP. The MSTP will cover the stipend of students until the end of April, or sometimes until the end of June.

PPOS

The School of Graduate Studies requires that students in their second year complete a Planned Program of Study (PPOS) in SIS. Until students complete the PPOS, they will have a Grad Records hold on their SIS account, and will not be able to register for spring semester.

An example of a completed PPOS is on the [Student Resources](#) page on the MSTP website. A few things to note:

- You must include courses you've already taken, including the IBIS courses, and the correct number of credit hours. You can see these in your Course History, which is in the Academic pull-down list in SIS.
- You must also include courses you plan to take. This course list is not binding and can be changed later if needed.
- Include 601 research credits, but not 701. When you log into SIS, the screen defaults to your medical school "career". On this page, the tab for "My program" does NOT appear. You have to go to "My planner" and change the "Institution/Career" from medicine to graduate. Then the "My program" tab appears so that you can complete the PPOS.
- Derek Abbott or Agata Exner will approve the PPOS in the spring semester of year 2.

Grading of IBIS Courses

IBIS courses comprising the MD curriculum are graded in order to provide graded graduate school credits that can count toward the PhD, substantially enhancing MSTP student progress toward completion of the PhD. Students should focus on learning, not tests, but it is important to define the evaluation system.

For IBIS 401-403, grades will be based on performance on:

- Summative Synthesis Essay Questions (SSEQs) at the end of each block.
- NBME Formative Multiple-Choice Question Examinations at the end of each block.
- Case Inquiry Group (IQ Group) Assessment. Facilitators are required to complete

assessments of small group participants during the midpoint and at the end of each of block. Students will be assessed on observable behaviors such as teamwork, preparation, quality of questions and contributions, group dynamics/peer interaction, leadership, professionalism, attendance, etc. The Case Inquiry Group (IQ Group) facilitator assessment for each student's performance during the block will be factored into the judgment of whether or not students "meet criteria" for performance in the block.

IBIS 411-413 courses will cover Foundations of Clinical Medicine. Components include Block 8/Foundations of Clinical Medicine components including Tuesday Seminars, Patient Based Programs (Physical Diagnosis and Doctor Patient Communication), and the Clinical Immersion Week in Block 4. At regular intervals during the year, preceptors complete clinical evaluations charting students' performance and growing competence in core clinical skills. From the MD curriculum evaluation, students will receive an evaluation of "meets" or "does not meet expectation" for each element as well as for professionalism. Dr. Abbott will assign IBIS 411-413 grades based on the MD program assessment and in consultation with the clinical instructors. Students who meet expectations in all areas will receive an "A".

Expectations for Academic Progress

Students are expected to perform well in MD curriculum components and the related IBIS courses, as well as other graduate courses and research rotations. If a student fails to satisfactorily complete one of the blocks, remediation opportunities and advising will be provided to help the student satisfy the MD curriculum requirements. Repeated block failures, inability to sufficiently remediate or other instances that are not consistent with MD curriculum performance standards may require review in the MSTP Steering Committee, leave of absence from the MSTP until expectations are met, or dismissal from the program. If a student withdraws or is dismissed from the MSTP, either through the student's decision or that of the MSTP, admission into the MD degree only program requires presentation to the Committee on Students. The student should be prepared to petition in person to the Committee for admission.

The PhD Phase

Curricular components of the PhD phase

Students transition into the PhD phase in the spring semester of year 2. Subsequent semesters are devoted fully to PhD studies and one or two years of the longitudinal MSTP Clinical Tutorial, which can be taken after completing at least one year in the PhD phase. Students register for courses to fulfill their PhD program requirements. As for all PhD students, MSTP students are required to maintain a "B" average in graduate courses.

IBMS 450: MSTP students are required to take a biostatistics course (IBMS 450 – Fundamental Biostatistics to Enhance Research Rigor & Reproducibility, 1 credit) in the fall semester of their PhD 1 year. MSTP students in Epidemiology & Biostatistics or in Clinical Translational Science, students with a Masters degree in statistics, or students who have taken PQHS431/432 may be exempted from this requirement, however **they need to attend the final session (which should be arranged with the instructor at the beginning of the semester)**. Students need to get approval from the instructor and the Associate Dean of Graduate Education in the Graduate Education Office and report it to the MSTP office.

IBMS 500. All MSTP students are *required* to take an ethics course (IBMS 500 - Being a Professional Scientist, 1 credit) in the spring semester of the G1 year in the program. This course is designed to fulfill the NIH requirement for all PhD and MSTP training programs and is taught by faculty from the Center of Bioethics at CWRU. Students may defer taking this course to a later semester *only* if there

are irreconcilable conflicts, and such deferral requires permission from the Program Director and a firm commitment on the part of the student to take IBMS 500 during the next spring semester (and to make sure that schedules are checked well in advance to prevent conflicts). *This is an NIH requirement.*

IBMS 501. RCR+4: Responsible Conduct of Research for Advanced Trainees. All MSTP students are required to take an ethics course the Spring semester before entering M3. This course is designed to fulfill the NIH requirement for all PhD and MSTP training programs and is taught by faculty from the Center of Bioethics at CWRU.

MSTP Clinical Tutorial: MSTP students are required to participate in clinical training integrated into the PhD phase. Students are strongly encouraged to do this through the MSTP Clinical Tutorial, but they can arrange for a clinical experience themselves and report it to Dr. Leizman for approval (See “Clinical Tutorial” below for detailed information). Clinical Tutorial can also be used to fulfill the CPCP requirement; CPCP is coordinated through Curricular Affairs in the Medical School.

PhD program requirements: Students should be aware that specific requirements for obtaining the PhD degree (e.g. required coursework, preliminary examination or thesis proposal format) vary between different graduate programs. It is the student’s responsibility to become familiar with these requirements. A maximum of 18 graded credits from the IBIS courses (MD curriculum) may be counted toward the PhD degree.

Graduate Programs

The following programs or program tracks are affiliated with the MSTP. Programs with asterisks are also affiliated with the CTSTP.

- Biochemistry
- Biomedical Engineering (BME)*
- Cancer Biology Training Program (through the Pathology PhD program)
- Cell Biology
- Clinical Translational Science*
- Developmental Biology (through Genetics and Neuroscience PhD programs)
- Epidemiology and Biostatistics*
- Genetics and Genome Sciences
- Immunology Training Program (through the Pathology PhD program)
- Molecular Biology and Microbiology
- Molecular Virology
- Neurosciences
- Nutrition
- Pathology (Molecular and Cellular Basis of Disease)
- Pharmacology
- Physiology and Biophysics
- Systems Biology and Bioinformatics*

PhD Thesis Work and Thesis Committee

In spring of year 2, the student will enter a PhD program with which the mentor is affiliated and follow the academic requirements of that program. Some advisors may hold appointments in more than one program. In this instance the student may choose which program to join, in consultation with the thesis advisor.

A thesis committee should be assembled as soon as possible, since it provides an important resource for advising that is critical early in the PhD phase. The thesis committee must contain at least one of the basic science representatives to the MSTP Steering Committee, and one member with an MD degree (a single committee member can serve both roles). If the student’s PhD advisor is a member of the Steering Committee, a second Steering Committee member must be selected to fill this role on

the thesis committee. The student should inform the MSTP office of the members and chair of the committee. The MSTP Steering Committee member and the chair of the thesis committee will serve as liaisons to the MSTP.

Students are expected to assemble their committee and complete the first thesis committee meeting no later than December of year 3 (Grad year 1), *even if their PhD program allows a later date for convening of the thesis committee*. The main objective should be a review of thesis research plans, project design and student progress. A copy of the thesis committee report must be emailed to the MSTP office by September to be available for MSTP Steering Committee review.

Students should pass their qualifying examination and/or thesis proposal within 12 months of entering the PhD phase; a 6-month extension may be granted if progress is otherwise satisfactory.

The student should have a thesis committee meeting at least once every 6 months. *This MSTP requirement overrides PhD program requirements if the PhD program requires meetings less frequently*. The student must inform the MSTP when they schedule a committee meeting and a copy of each thesis committee report should be sent by email to the MSTP office for the student's file, so the MSTP is kept informed of the student's progress. For example, the committee chair will often write a report after a committee meeting and should provide a copy of this to the MSTP (the student and the Steering Committee member on the thesis committee should help by suggesting this to the committee chair). The MSTP office will track the timely and satisfactory completion of thesis committee meetings and will contact the student and Director if a thesis committee meeting is overdue. This is in addition to the monitoring provided by individual graduate programs.

The thesis project should be research-based and not a mere survey or descriptive analysis. We note that MSTP students do have special circumstances, since they must spend 4 years in medical school as part of their program. Given this extended time in the medical school part of the curriculum, the PhD mentor and thesis committee are encouraged to help the student select a project that has a realistic time frame for completion. Nonetheless, the project must have significant goals and meet the requirements for a PhD in the graduate program in which the student is enrolled.

Expectations for Student Progress in the PhD Phase

By completion of the PhD phase, students should have 2 or more first-authored primary research publications in peer-reviewed scientific journals. At least one first-authored primary research paper must be accepted for publication before completing the PhD phase.

MSTP students are required to satisfy the publication requirements of their PhD program (1 or 2 significant first-authored research publications in reputable scientific journals as judged by the thesis committee and PhD program). If the graduate program does not specify a publication requirement, the student must publish at least one significant first-authored research publication in a reputable scientific journal. It must be emphasized that this is a minimum requirement that falls below the expectations of the program. Students are expected to strive for higher levels of accomplishment. Most PhD programs require 2 publications, and MSTP students should aim for 3 or more first authored publications (the mean is 3 first authored research publications for MSTP students). Students are urged to organize their research to result in publications prior to the last PhD year, as it is difficult to finish multiple publications on different aspects of a PhD project just prior to the PhD thesis defense.

Mentors and PhD programs that graduate students without meeting publication requirements will be reviewed for potential revocation of their affiliation with the MSTP.

It is important to focus on quality and impact of publications, not just quantity. In general, one high impact paper is more important than two lower impact papers. Publication requirements and timetables should NOT compromise the tackling of ambitious and significant research goals. Evaluation of students will be individualized with consideration of unique aspects of the thesis

project, and the Steering Committee will consider the time barriers of well-conceived ambitious projects in formulating expectations for progress so that students will not be penalized for pursuing important and ambitious scientific goals. Students should all seek to tackle scientific problems of substantial significance in their PhD research.

The MSTP Steering Committee will periodically review progress of all students, including those in the PhD phase. Upon review of students, if progress appears inadequate, the Steering Committee will attempt to advise the student to help improve productivity and enhance chances of successfully completing the PhD. If progress is below standard, the Steering Committee may vote to remove a student from the MSTP. Such a decision by the MSTP would not necessarily remove a student from the PhD or MD degree program (standing in the degree programs are determined by the PhD program or the MD program). Students who are dismissed from a graduate program for academic reasons will be removed from the MSTP. If a student withdraws or is dismissed from the MSTP, either through the student's decision or that of the MSTP, admission into the MD degree only program requires presentation to the Committee on Students. The student should be prepared to petition in person to the Committee on Students for permission to reenter the MD curriculum.

Timeline for the PhD Phase

Students will be reviewed regularly for progress with the following expectations:

- PhD year 1 (G1): Completion of qualifying examination and/or thesis proposal or substantial progress to achieve such completion within the next 6 months.
- PhD year 2 (G2): Qualifying examination and/or thesis proposal must be completed before or during the first half of this year. By the end of the year, coursework should be complete except for 701.
- PhD year 3 (G3): Substantial progress toward PhD dissertation and publication of papers must be evidenced. By the end of year 3, students should have at least one first- authored paper published, submitted or very close to completion for submission.

Students should aim for completion of the PhD in 3-4 years. Most students take 4 years, but a significant number complete this phase in 3 years. A 5th year will be allowed, but extension of the PhD phase beyond 5 years should not generally occur and will require approval of the Steering Committee as an exception to the expected timetable. After students enter the G5 year they must have a thesis committee meeting every 4 months.

If a student must change his/her PhD mentor in the PhD phase, this should be done as early in the program as possible, generally within the first year of the PhD phase. After completion of the first year of the PhD phase, any change in PhD mentor will require approval by the Steering Committee as a special exception. After completion of G2 it is usually not possible to switch PhD mentors. The Steering Committee will consider special circumstances, e.g. departure of a mentor, and will make exceptions when appropriate.

Completion of the PhD Phase

All PhD requirements, including the thesis dissertation defense and publication requirement, *must* be completed before starting M3.

1. By 5 weeks prior to M3 start:
 - a. Complete all requirements for the PhD except the actual dissertation defense. These requirements include publication requirements, approval by the thesis committee that the dissertation defense can be scheduled, completion of the written dissertation document and delivery to the thesis committee.
 - b. Complete scheduling of the dissertation defense, filing the form "Notification for

Scheduling of the Final Oral Exam for the PhD” with Grad Studies and public posting of the defense (Grad Studies requires this to be submitted three weeks prior to defense); the defense date must be at least 2 weeks prior to M3 start.

2. By two weeks prior to M3 start:
 - a. Dissertation defense must be done.
3. By the last business day prior to M3 start:
 - a. Complete all revisions of the thesis and obtain final approval of the committee/mentor with signatures on the forms. PhD completion materials and forms must be delivered to Graduate Studies before the start of M3.

As outlined above, the thesis defense must be scheduled with Graduate Studies well in advance to meet their requirements. Students should check the [School of Graduate Studies calendar](#) for relevant deadlines.

The PhD mentor is responsible for the student stipend until the start of the clinical curriculum. Students should remain active in the laboratory until the end of this period, except for the normal amount of vacation allotted for each year.

Students are expected to remain active in laboratory research until the end of the period of support by their thesis mentor, *even if that period extends beyond successful completion of the PhD*. For example, a student may successfully defend a PhD thesis in March to meet the deadline for May PhD graduation, yet remain active in the mentor’s lab through June. This can be a very productive period where students complete experiments indicated by the reviews of the manuscripts they submit prior to their defense, complete additional projects and papers, or help with new or ongoing projects that will result in additional co-authored manuscripts.

Many MSTP students don’t make the deadline for completion of their PhD thesis defense in time to receive the PhD at May commencement ceremonies, and it is common to target a defense date in June that will allow official conferral of the PhD in the summer semester (August graduation date). The graduation date (May vs. August) is generally not of concern to MSTP students, but the May date provides ceremonial events that are not recapitulated on other graduation dates.

Unlike straight PhD students, MSTP students do NOT have to register for graduate credit in the summer semester if their official PhD graduation is in August and they return to medical school in July. Likewise, MSTP students who will have their PhDs conferred in January do not have to register for graduate credit in the fall semester if they return to medical school by November. However, they must submit a [waiver of registration form](#) to Grad Studies.

Health Care Coverage

MSTP will provide student health insurance for students in M1-M4. Students in the PhD phase are covered by their individual departments. Students can waive the insurance if they are covered under another plan. Students on the CWRU health insurance plan must register for the spring and fall semesters to be covered during the intervening summer months.

Training Grant Support in the PhD Phase

There is a five-year limit for NIH pre-doc funding from T32 training grants or NRSA fellowships, and a 6th year can be granted to MD-PhD students upon application to the NIH. The MSTP T32 (or CTSTP TL1) typically supports students for M1 and M2, as well as M3 and M4. Therefore, support on other T32 training grants during the PhD phase must be limited to no more than two years, and the MSTP

office must be notified of the exact period of such T32 support (so we will know if application for a 6th year extension is necessary). Failure to follow these rules will threaten our ability to support a student in M3 and M4.

Citing the Training Grant

It is important for our training grant reporting that student publications acknowledge support from the CWRU MSTP. Students may also use this information on posters or other communications and displays. The MSTP grant is T32 GM007250; the CTSA grant is TL1 TR000441. Check your personal information in eRA Commons if you don't know to which training grant you've been appointed .

Please use text similar to the following: " ____ was supported in part by NIH grant T32 GM007250 (and TL1 TR000441, if appropriate)." Note: if you were ever appointed to the TL1 grant, list both the TL1 grant and the T32 grant.

Alternatively, you can include T32 GM007250 (and TL1 TR000441 if appropriate) in your list of grants providing support. They should also be included when submitting publications to PubMed Central.

F30/31 Applications

Students are strongly encouraged to apply for an individual NRSA F30/F31 PhD or MD/PhD fellowship award; ideally all MSTP/CTSTP students will do so. Students benefit from the prestige of the award (important for residency and fellowship applications), additional budget for training- related expenses and travel, a possible bonus to their stipend, and in some cases, support for the MD phase. The mentor and research program also benefit from the additional support. F30 awards and some F31 awards can fund both the PhD and the MD phase. *The maximum allowable period of support should be requested to cover both PhD and MD training.*

Students with F30/31 support will receive an annual \$2,500 stipend bonus while they are supported by the MSTP (years M3 and M4). Many, but not all, School of Medicine departments also give the stipend bonus in the PhD phase. Students should check with their PhD mentor's department administrator. While in years M3 and M4, the MSTP will charge student health insurance fees to the F30/31. The health fees come under the Institutional Allowance budget line. Students are permitted to use the remainder of the Institutional Allowance for training related expenses.

All students applying for individual NIH awards (e.g. F30 or F31) must notify the MSTP director and administrative director prior to application.

Usually the department where your mentor has his/her primary appointment will administer the grant application. (In some cases it might be the PhD granting department, if the mentor is not appointed there.) Contact the administrators in the department(s) to coordinate the submission of your grant. *These departments are generally unfamiliar with budgets for both MD and PhD training phases, so it is essential to involve the MSTP in the budget planning.* Please contact Diane Dowd; Derek Abbott and Cliff Harding are also available to review and advise.

F30/31 applications must be submitted within 48 months from the time of matriculation as an MD-PhD student. Applications are accepted in three cycles per year, in April, August, and December. Because CWRU MSTP students matriculate in July, the latest possible application cycle for the initial submission is April of G2. If the initial application is not funded, resubmission can be after the 48 month window.

See Information for F30/F31 applications, on the Student Resources page on the MSTP website.

Many MSTP students who have had F30/31 proposals funded have contributed valuable advice and made their applications available for other students to see. Ask the MSTP office for access to the shared Google grants folder. Students also hold a discussion panel at least once yearly, to allow students with grant application experience to advise students who are planning to apply.

Clinical Tutorial

M4 Clinical Elective Credit and CPCP Credit

Guidelines and forms for the MSTP Clinical Tutorial are included in the Student Resources section on the MSTP website.

The MSTP Clinical Tutorial is a longitudinal pre-clinical experience for MSTP students in the PhD phase. It is taken after the first year of the PhD phase and should take 2-3 hours per week. Students are required to take the MSTP Clinical Tutorial for one academic year in a patient-based clinical specialty (not Radiology or Pathology). Students can get 2 weeks of clinical elective credit for this first year experience as well as credit for CPCP, providing they complete the requirements of the CPCP curriculum. Students may take a second year of MSTP Clinical Tutorial in any clinical specialty, including Pathology and Radiology for two additional weeks of clinical elective credit.

The Tutorial is designed to meet unique needs of MSTP students and addresses two distinct goals. First, the Tutorial enhances clinical skills to promote successful entrance into M3. The second goal, perhaps most unique to this course, is to provide a longitudinal opportunity to go back and forth between the research and clinical worlds to explore connections between basic biomedical research and clinical problems. This career development experience may clarify which clinical field meshes best with a student's scientific interests. Thus, the Tutorial may ease the choice of and transition into clinical residency as well as the entrance into M3.

The MSTP Clinical Tutorial can be tailored to the individual student's interests. Many students choose a general clinical experience, e.g. an internal medicine service, but others choose to work in a specialized clinical field related to their research interest. For example, a BME student doing research on imaging has worked with a radiology team, a student interested in shock and related pharmacology has worked in an ICU and a student with cardiovascular interests has worked with a cardiologist. This flexibility provides a unique chance to do related clinical and research work simultaneously, providing a glimpse of future possibilities for students who want to combine these activities later in their careers. The Coordinator of the MSTP Clinical Tutorial, Debra Leizman, MD, holds an informational meeting each fall to help arrange clinical placements for students.

If a student is not making appropriate and desirable rate of progress toward completion of the PhD degree, the MSTP Steering Committee will recommend and may require that the student defer participation in the MSTP Clinical Tutorial, particularly a second year of Clinical Tutorial. Mentors should communicate such reservations to the MSTP Director or Steering Committee. Otherwise, PhD mentors are expected to accommodate participation of their MSTP students in the MSTP Clinical Tutorial.

Students are expected to spend 40-60 hours during one academic year to obtain 2 weeks clinical elective credit for the M4 year. This translates to 2-3 hours per week in clinic over two semesters. The student does not need to spend a full 12 months on the Tutorial in a given year. There must be a balance between the Tutorial and the compelling need to concentrate primarily on PhD thesis research. Accordingly, students should not substantially exceed the recommended time commitment to the MSTP Clinical Tutorial. It is not possible to get more than 2 weeks clinical elective credit for the Tutorial in a single academic year.

Students start the Tutorial in early fall. Under some circumstances, it may be possible for a

student to shift the timing (start early or late to finish early or late), but this should be discussed and approved ahead of time with the MSTP Director, the Coordinator of the MSTP Clinical Tutorial, and the Office of Curricular Affairs (if taking for CPCP credit).

Selection of a Clinical Preceptor

Students can either identify a preceptor on their own, and notify Dr. Leizman, or ask Dr. Leizman to identify a preceptor in their area of clinical interest. The key to a successful clinical tutorial is selecting a mentor who has enthusiasm for clinical teaching, an appropriate environment (e.g., clinic or office practice), and sufficient time.

Clinical Refresher Course

In addition to the MSTP Clinical Tutorial, an MSTP Clinical Refresher Course is offered in the spring semester. The MSTP Clinical Refresher Course serves as a timely means to enhance students' clinical skills shortly before they start M3. This non-credit course includes half-day clinical exercises over the course of one week and highly encouraged, but not required.

M3 and M4 Years

MSTP students must complete *all* requirements for their PhD degree, including the thesis defense and publication requirements, *before* starting the M3 curriculum. The publication requirement is either that mandated by the PhD program or one first author manuscript, whichever is greater. The defense date must be submitted to Graduate Studies at least 5 weeks prior to the start of medical school and 3 weeks before the scheduled defense. All dissertation revisions and Graduate Studies paperwork must be completed before return to medical school.

During M3 and M4, MSTP students are responsible for the same academic requirements as all other medical students.

See the [Return to M3 To-Do List](#) on the MSTP website. .

When Do MSTP Students Start the M3 Curriculum?

MSTP students can start the core M3 clinical clerkships from early July through late October/early November. See the [clinical rotations calendar](#).

Each fall, the SOM Registrar meets with MSTP students planning to return to med school in the following summer or fall, to discuss the timing and options. A July start will allow ample time for electives and travel for residency interviews in M4, but all requirements can still be completed with a start as late as the end of October/beginning of November.

Students should consult their Society Dean advisor and the Medical School Registrar concerning the scheduling of M3 Core Blocks. Students must inform the Registrar, their Society Dean, and the MSTP administrator of their plans for returning to med school, and must keep everyone informed if their plans change.

Students often have questions about the relative advantages and disadvantages of starting M3 at different times. July 1 is the "traditional" return date. It is also possible to start the M3 core blocks in September or late October. NOTE: Starting in September gives the same amount of clinical training time as straight MD students (who do 4 months of research and 2 months of USMLE/reading elective time in M3 – for a total of 6 weeks away from clinical rotations). Thus, starting as late as September will not put MSTP students in a time crunch for clinical training.

The following text discusses some concerns that students have expressed about starting in late October.

1. Concern: "Students who start in October will be more behind their straight MD classmates starting at the same time." This is true to some degree, but note that the straight MD students take a 4-month research block early in M3, and 6-8 weeks for USMLE boards, so MD students doing a Core Block starting in October will have at most 4 months and sometimes as little as 2 months of M3 clinical experience. Thus, MSTP students will be a little behind at the start of the clerkship but should catch up quickly. Furthermore, MSTP students can mitigate this issue by participating in clinical activities prior to the start of the clinical core blocks, including Clinical Tutorial and Clinical Refresher, and clinical electives that can be taken prior to the clinical core blocks (see above).
2. Concern: "Students who start in late October won't have enough time for vacation to go on interview trips for residencies. This is an issue, but it is reduced by taking a second year of MSTP Clinical Tutorial during the PhD phase and/or clinical electives prior to the first core block.
3. Concern: "Students who start in late October won't have enough time for an Acting Internships (AI) before residency applications are due." There is an issue here, but it can usually be defused by scheduling an AI as soon as possible (consult the Medical School Registrar). A October/November return should still allow a student to complete a 4-week AI well before the time when materials for most residencies are due (mid-late October). Note that Ophthalmology, Pediatric Neurology and Neurosurgery have deadlines that are earlier than other residencies, which could complicate this schedule for some students.

How to Schedule M3

Medical School Communications: The student must check to make sure that the medical school advisors and registrar have the student's correct current address and contact information (including email address).

- Meet with your Society Dean and an MSTP Director/Co-Director in the fall of the anticipated year of PhD defense to discuss planning for PhD completion and transition to M3. Complete the MSTP Re-entry Checklist on the Society Deans Advising Portal and upload the form 48 hours prior to the meeting. (<https://med-ed.case.edu/SocietyDeanAdvising/Mw%3d%3d>)
- Contact the Medical School Registrar by January if you expect to finish your PhD by summer or fall. She will inform you of the schedule and procedures for choosing the order and hospital location of your clinical rotations.

M4

M4 includes acting internships, clinical electives and research electives (if M3 is started by October or earlier). Time should be allotted for residency interviews.

Career Planning and Residency Applications

All MD students in the University Program, including MSTP students, are assigned to one of five Societies headed by a Society Dean, who will provide advising for medical school, career planning and residency application. The Society Dean will become familiar with the records of all students in their society and will be in a good position to advise students on many aspects of career planning, including the best strategies to use in applying to residencies and who to consult for more information on residencies in specific fields. Students should contact their Society Dean with any questions about planning for residency applications or other career planning decisions.

It should be recognized that the Society Deans are mostly involved in advising of MD students and

may not emphasize the particular aspects of research-oriented residency training that are desired by most MSTP students. Students should explicitly raise the issue of research track residency if they wish to explore this option (research careers can also be pursued with traditional residency programs). Dr. Harding is an additional source of advice on these topics. In addition, each spring the MSTP hosts a reception for graduating students, and these students are assembled into a panel to discuss their experiences and knowledge concerning residency application from the MSTP viewpoint. All students are encouraged to attend.

MSPE

- The student's Society Dean will compile a [Medical Student Performance Evaluation](#) (MSPE) for each student's residency applications. Students meet with their Society Dean to review and revise this evaluation, and should spend significant effort to do so. The Society Dean must compose a truthful account of the student's accomplishments, but the student is allowed considerable opportunity to influence the composition of the letter. Especially since the letters for MSTP students include content that goes beyond that of the typical MD student, it is important for students to actively review the dean's letter and suggest revisions. More than one meeting with the Society Dean may be needed.
- The MSTP Director and Co-Director will write an MSTP letter of support to the Society Dean. This document will provide information on the student's MSTP progress up to completion of the PhD phase and will be incorporated into the MSPE. The MSTP letter of support will not constitute a separate letter of recommendation, will not be mailed to any other institution, and therefore will not limit the student's number of letters of recommendation from other faculty.
- The student will need to obtain several letters of recommendation from faculty members. Suggestions for this process are indicated below.

Letters of Recommendation from Faculty

Students will need several letters of recommendation for residency application. The choice of who to ask for these letters is personal, and each student will need to make his/her own choices.

The exact requirements for letters of recommendation vary with the type of residency, and each student will need to determine the number and types of recommendations to obtain. Many residencies restrict the number of letters to three (or sometimes four) in addition to the Dean's letter. Others will accept more letters.

Students will provide their faculty letter writers with a completed ERAS Request for Letter of Recommendation/ Cover Sheet, and writers will submit letters to the Medical School Registrar. Most students waive the right to see their letters. Students will need to designate the letters to be sent to each residency to which you apply (you can send different letters to different residencies).

Most students will want two or more strong letters from clinical rotations, preferably 1-2 from the field of proposed residency. When selecting clinical mentors to write your letter, it is best to choose a mentor who gave you a very good evaluation and can be expected to write a strong letter for you. Make sure that the mentor knows you well enough; you can ask him/her if you are unsure.

MSTP students usually request a letter from their PhD thesis advisor.

Materials to Provide

Each letter writer may have specific requests for information, but the following are recommended

items to provide to those who will write letters:

1. CV including the following information, which should be precise, complete and accurate. A template of the CV can be found in the Student Resource section of the website.
 - All degrees awarded and universities that awarded them
 - All awards or honors, including baccalaureate distinctions (cum laude, magna cum laude, summa cum laude, CWRU events (e.g. Lepow Medical Student Research Day, Graduate Student Research Day), awards at national or regional scientific meetings, etc. List any fellowships or grants, etc. Give dates and make clear which awards were earned during your time as an MSTP student.
 - Thesis title, thesis advisor(s) and field (graduate program) in which you received your PhD, as well as the home department if different from the PhD program name
 - All publications (including any from prior to your matriculation in the program)
 - A separate list of abstracts and meeting presentations (include journal citations for any published abstracts)
 - A list of any other honors or distinctions
2. Personal statement that indicates what type of program you are applying to and why you chose that field (indicate research connections). Provide a description of your clinical and scientific interests, and your career goals.
3. Research summary (1-3 pages) and the title of your thesis.

Some faculty may request that you write a draft. If so, anticipate that they will revise it to reflect their viewpoint, but writing a draft, if requested, may provide information that will help them write a more complete letter in the time they have available for this – many faculty have limited time for this and may be asked to write multiple letters – help them do a good job for you!

Other Hints for Residency Application and Interviewing

Write your residency application to separate yourself from the crowd. Emphasize your research and academic accomplishments and goals. Since some materials may not fit in the ERAS application, mail any research summaries or other materials you want considered with your application directly to the residencies. Do this before visiting programs.

Bring materials with you to your interviews. The short version of your research summary will suffice for most interviews, since the interviewer will probably not be in your exact scientific field. However, you should bring the long version of your research summary, and perhaps other materials (e.g. reprints, etc) with you on interview trips. If you happen to meet someone who will appreciate the details, you can give him/her a copy of these materials.

The Residency Application Process

The Society Deans and Medical School Registrar schedule several meetings during M3 to describe the residency application process and help prepare students for this process. You will want to plan your M4 schedule with your residency plans in mind (this may dictate the selection and timing of acting internships or other rotations in fields of interest). Most students find it best to schedule an acting internship for some time in July, August, or September of M4. All medical students (including MSTP students) should meet with their Society Dean late in M3 (preferred) or early in M4 to discuss residency plans and the MSPE.

Many students also make appointments early in M4 to meet with the chair of the department or chief of the clinical service division in the field they will enter for residency. The chair can give an evaluation of strong residency programs. If he/she knows the student well enough, he/she may also provide a letter of recommendation.

Older students are often the most helpful source of information in planning the residency application process. The Case MSTP has a tradition of having a graduation party with a panel discussion featuring graduating students who field questions from their junior colleagues about strategies and planning for the clinical year, residency applications and career planning. MSTP students should also consider contacting other fourth year medical students or former students who are already in a residency program in their area of interest.

See the [SOM Registrar page](#) and the [AAMC web page](#) for ERAS deadlines and FAQs.

MSTP Support and Benefits

The Case MSTP provides the following benefits.

- Full tuition support for both MD and PhD training.
- Stipend (\$30,500 annually, as of 7/1/2020).
- Laptop Computer (up to \$1500)

The MSTP will subsidize the purchase of one laptop computer for each student during his/her tenure in the program, subject to certain limitations. The computer must meet School of Medicine requirements. In general, the program provides funds equal to the least expensive laptop recommended by the School of Medicine. Students may combine MSTP support with their own funds to purchase a more expensive computer.

Computers purchased with MSTP funds are considered property of CWRU. A student who does not complete the program may be required to return the computer or reimburse the program. Students who complete the program keep their computers.

Students are responsible for maintenance and repair of their computers, and are responsible for purchasing additional computers if needed.

- Health Insurance

The MSTP pays the annual health insurance fee for all students. Students have the option to waive health coverage if they are covered under another plan. The MSTP does not provide coverage for spouses or dependents, and does not cover the cost of co-pays or any additional fees.

- Student Activity Fees

The MSTP pays the annual student activity fees, but does NOT pay for the One-to-One Fitness Center student membership. Students must waive this fee in the Student Information System (SIS) if they do not want the membership, or must pay the fee themselves. The MSTP does NOT pay for the RTA fee; the student is responsible for paying this fee.

- Scientific Meetings

To encourage students to present their research at national and international meetings, the MSTP provides up to \$300 per year for meeting and travel expenses. The presentation can be either a poster or a talk, and it must be on research done while in the program. The funds are primarily for students in the PhD phase, but can sometimes be provided for students in other phases. To request travel funds, students should contact the MSTP office in advance of the meeting and ask for details on allowable expenses and reimbursement policies.

Also, Grad Studies may provide matching travel funds, up to \$500 for travel to meetings in the US, or \$1,000 for international travel. A few things to note about the matching funds (these notes apply only to the Grad Studies matching funds, not the MSTP travel allowance):

1. They are not always available. Grad Studies has an annual budget for this, and when the funds are used up, they're gone for the year. (The budget year is July 1 to June 30.)
2. You can use them only once in your graduate career. If you think you may have an international meeting coming up, or a more expensive US meeting, you might want to save this option for later.
3. You need to apply for the funds at least two weeks BEFORE you travel. It's best to apply as early as possible, as soon as your abstract is accepted. The application form can be found on their website: <https://case.edu/gradstudies/index.php/current-students/forms>
4. If you're approved for the matching funds, all payments, including the MSTP share, will be processed through the Grad Studies office. You'll need to turn all receipts in to them, and give copies of receipts to the MSTP office as well.

- National MD-PhD Student Meeting

Each year, the Steering Committee selects one or two students to attend the National MD-PhD Student Meeting in Colorado, and the American Physician Scientists Association meeting in Chicago. One URM student is chosen per year to attend the ABRCMS meeting with representatives from the Graduate Education office and the PREP program. Travel and meeting expenses are paid by the MSTP.

- Poster printing

Posters can be printed through the Department of Physiology and Biophysics for \$75, paid with cash, check, or speedtype. The link for the poster printing request form with guidelines can be found here: https://physiology.case.edu/media/uploads/DPB_Poster_Printing_Request.pdf

Posters can also be printed at FedEx located at Thwing, and can be paid for with cash, check, or a speedtype.

Activities

The Case MSTP is a vibrant program with numerous rewarding program activities. Attendance at the Summer Retreat is required for all MSTP students. Other activities are optional, but students are strongly encouraged to participate in MSTP Council and MSTP programmatic events. Such participation provides significant opportunity for professional development and recognition.

Summer Retreat

All students must attend the annual MSTP Summer Retreat (for students in M3 and M4, attendance is encouraged but optional). This retreat is a two-day event focusing on professional development and program planning for the upcoming academic year. The retreat features include:

- Scientific presentations by faculty (a featured outside keynote speaker and Case faculty)
- Scientific presentations by students
- Workshops to enhance professional skills (e.g. grant writing, preparation of scientific manuscripts, developing presentation skills) or educate students in common technical approaches (proteomics, microarray gene expression analysis, generation and use of transgenic mice, etc.).
- Discussion of Case MSTP programmatic issues and planning of MSTP events in the coming year. This includes discussion of the organization and activities of MSTP Council.
- Recreation and conviviality

Research Symposia

MSTP students are encouraged to present their research at two annual CWRU student-sponsored symposia. The annual Biomedical Graduate Student Symposium is organized by students of the biomedical graduate programs and features poster or oral presentations by PhD students, including MSTP students. The Lepow Medical Student Research Day is held each year for medical students and MSTPs to present their research. Both meetings are open to attendance by all students and faculty in the School of Medicine. These symposia feature a nationally recognized keynote speaker, and students have the opportunity to interact extensively with the noted scientist. Prizes are awarded by a faculty committee for outstanding student presentations. The prizes provide both monetary motivation and an honor that can be cited on a student's CV and residency recommendation letter, so MSTP students are urged to participate in these events. Students in their first two years of the MSTP program are encouraged to attend, since these venues provide an excellent opportunity for students to explore the diversity of our training environment and observe the work that is ongoing in the labs of different MSTP mentors.

MSTP Council

MSTP Council meets monthly, and coordinates many activities of the program. The overall goals are to identify objectives for the program, to enhance the MSTP, to encourage increased student involvement, and to develop leadership skills. The president, vice president and secretary are elected for a one-year period. Committees are led by one to three committee chairs. All students are welcome and encouraged to participate. The MSTP Council Charter is on the Resources, Links, and Forms page on the MSTP website.

Recent Council committees have included the following:

- Summer Retreat Committee: Plans the agenda and invites speakers, in collaboration with the MSTP Director and Administrative Director
- Intro to MSTP: Helps first year students adjust to the program and CWRU. First year students have a budget of about \$75 per person, to be spent on group activities. Class members must agree on how to spend the funds.
- Communications and Webpage Committee
- Community Service Committee: Plans various activities in the City of Cleveland
- Social Committee: Plans the holiday party and other events throughout the year
- Monthly Dinner Seminar Series: Coordinated by MSTP Council Vice President. Students schedule the meetings and invite the speakers.
- MSTP Representative to Faculty Council
- MSTP Representative to the Committee on Medical Education
- MSTP Representative to the CWRU Graduate Student Senate
- MSTP Representative to the Biomedical Graduate Student Organization (BGSO)
- MSTP Women's Committee: Organizes Women's Group activities.
- Recruiting Liaisons: Work with the MSTP staff to plan and organize interview days
- Other committees may be formed at the discretion of Council.

Women's Group

Women students in the MSTP get together to support and mentor each other, and sometimes invite alumni and faculty to discuss career development. These activities may be coordinated

through MSTP Council or independently and may be partially funded by the MSTP.

Non-Research Activities

Students are expected to devote full time effort to expectations of the MSTP. We strongly encourage students to participate in programmatic events and to take student leadership roles. These roles can provide valuable professional development and professional community contribution opportunities, but are feasible only if students are making good academic progress. Students interested in taking on time-consuming leadership roles in extracurricular or professional activities should first get approval from the MSTP Director and/or Co-Director, as well as the PhD thesis advisor (for students in the PhD phase).

Students should self-assess and tune their level of extracurricular participation to their trajectory in progress on academic expectations. If progress is good, participation and leadership in worthy program activities is strongly encouraged. If progress is lagging, students may still participate in program activities but should avoid major time-consuming leadership commitments. The same considerations apply for participation in national student organizations.

Examples are indicated below.

- Students in the PhD phase who desire teaching experience may participate as a TA in a course or as an IQ facilitator as long as the following criteria are met. The student must have advanced to candidacy for the PhD degree (completed thesis proposal and qualifying examination).
- The student must justify how the activity relates to their scientific field or professional goals.
- The student must first request approval from the MSTP Director or Co-Director. The MSTP will include the PhD mentor in the decision process.
- For IQ teaching, the period of teaching is limited to ½ Block for one year, and students should participate in one year only. Exception: Participation on BME teaching requirements is expected for students in the BME PhD program.
- MSTP students should NOT take on the role of Director for Doc Opera. The MSTP supports participation in Doc Opera and other extracurricular activities at less demanding levels.
- MSTP provides some funds for social events for all students.