

MSTP Mentor Guidelines

1. Who Can Be an MSTP Mentor

The MSTP Steering Committee reviews and approves MSTP mentors. The MSTP welcomes nominations for new mentors. Nominations should be submitted at least two months before planning a research rotation.

Many criteria are considered in the evaluation of potential mentors. One requirement is the faculty member need to be in a tenure track position and be approved as a trainer in an MSTP-affiliated PhD program or subsidiary training program (see following list).

1. Biochemistry
2. Biomedical & Health Informatics
3. Biomedical Engineering
4. Cancer Biology Training Program (through the Pathology PhD program)
5. Cell Biology
6. Clinical Translational Research
7. Epidemiology and Biostatistics
8. Genetics and Genome Sciences
9. Molecular Biology and Microbiology
10. Molecular Virology
11. Neurosciences
12. Nutrition
13. Pathology: Immunology
14. Pathology: Molecular and Cellular Basis of Disease
15. Pharmacology
16. Physiology and Biophysics
17. Systems Biology and Bioinformatics

(Note: In cases where there are separate tracks within a program, they are listed here as Program: Track. Some programs have additional tracks that are not listed here. MSTP students may enroll ONLY in the tracks listed above. Developmental Biology is listed on the MSTP website as an area of interest that students may pursue. However, it is neither a specific training program nor a track within a program.)

A second requirement is adequate funding to support student stipend and tuition. This generally comes from the mentor's research grants. The home department of the mentor is often the source of tuition support and is expected to provide support for the student during any period of funding shortfall during the student's PhD training. In addition, the laboratory must be able to provide adequate space and resources to support the student's research.

Third, evidence of strong scientific productivity and an independent research program is necessary. This can be shown by publications (e.g. consistent production of senior-authored publications in recent years) and evidence of consistent and current funding from competitive extramural sources (e.g. R01 grants from the NIH) as a principal investigator.

Fourth, a track record of successful prior mentorship, especially for PhD students in graduate programs involving the MSTP is required for approval as a senior mentor.

There are two categories of mentors, senior mentors and initial mentors.

Requirements to be a senior mentor:

- a. Membership in one of the MSTP-affiliated PhD training programs.
- b. 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). Candidates should be a principal investigator on one or more NIH research grants (R01 or equivalent) or other similar externally-funded peer-reviewed grants.
- c. A good training record with prior PhD students.
- d. Resources and space for a PhD-phase MSTP student.

Requirements to be an initial mentor:

The above criteria are applied, but approval may be granted as an initial mentor to 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 taking a student in the laboratory, initial mentors will be required to identify a senior mentor who is an MSTP trainer and who is willing in principle serve as a co-mentor for the student placed in the initial mentor's lab. Designated co-mentors must submit statements that they will actively co-mentor students and take significant responsibility for the training outcome of these students. When initial mentors achieve the requirements for senior mentor status, they will be considered senior mentors.

The MSTP maintains a list of MSTP training faculty who are approved to serve as MSTP mentors and are published on the MSTP website. Approved mentors may serve as rotation mentors and are likely to be approved for thesis work given an appropriate project and availability of resources and space. Nonetheless, the MSTP Steering Committee must approve final placement of a student into a lab for thesis work.

The current MSTP mentor list is reviewed periodically by the MSTP Steering Committee. Generally, updated information, including CV or biosketch, funding, and training record will be requested every 1-2 years and during training grant renewal years.

2. Rotations

MSTP students should only rotate with MSTP-approved mentors. MSTP students select rotation mentors from the MSTP-approved mentor list, available from the MSTP office or on our web site. MSTP-approved mentors generally can accept rotation students without review by the MSTP Steering Committee (administrative approval from an MSTP director is still required, and the Steering Committee may be consulted in some circumstances).

MSTP students are expected to spend a minimum of 4-5 weeks in a full time summer rotation (40 or hours/week) or 8-12 weeks during the academic year (~15 hours per week in the lab). At the end of a rotation the student is encouraged to give a presentation of the work carried out during the rotation.

The student should also write a rotation report and submit it to the mentor with the rotation evaluation form. The mentor and student should go over the evaluation and discuss whether the mentor would be willing to accept the student into the lab. For 1st year students, it may be difficult for the mentor to project availability of a position (perhaps a year or more in advance). In this case, as a minimum, the advisor should indicate whether they would be willing to accept a student should a slot be available, and the student should communicate with the mentor over the succeeding year to determine the availability of a slot. **The student must turn in the rotation report and evaluation to the MSTP office.**

3. Number of MSTP Students per Lab

In considering students for rotations and PhD placement, the following rules should be considered.

- a. The MSTP Steering Committee must approve placement of more than two PhD –phase students in one lab at the same time. Generally, this will only be allowed for mentors with documented success as mentors for prior MSTP students. There will be no more than three MSTP students in a lab at the same time.
For initial mentors, approval must be obtained for more placement of more than one MSTP student, and there will be no more than two MSTP students in a lab at the same time. This means that after placement of one PhD phase MSTP student, Initial Mentors should not take rotating students until the first student completes the PhD or the mentor’s request for an exception to allow a second student is approved.
- b. Once a lab has two MSTP students (one for initial mentors), approval must be obtained from the MSTP before hosting any additional MSTP rotations. Once a lab has three MSTP students (two for initial mentors), the faculty mentor should only be taking MSTP rotation students if one of the current students will complete the PhD by the time of potential PhD phase placement of the rotating student.
- c. Usually only one MSTP student may enter a lab per year. In unusual circumstances a mentor may accept two MSTP students in a given year, but only with MSTP Steering Committee approval based on prior success in the mentoring of MSTP students. If two MSTP students enter a lab in the same year, the mentor will be removed from eligibility to accept an MSTP in the following year.

4. PhD Placement

When a student and mentor have decided to commit to one another, they should seek approval from the MSTP as early as possible, generally in the fall of the second year, after completion of three rotations. The MSTP will request updated funding, biosketch and training information from the mentor.

Upon entry to the lab for PhD research, the student will transfer to a PhD program with which the advisor is affiliated and follow the academic requirements of that program. Responsibility for student support will be transferred to the mentor and their home department in the spring semester of year 2. Students will take a graduate course in this semester, and will begin full time work in the lab by May 1 (they complete MD courses by early March after which they study for and complete USMLE board part I by the end of April).

The MSTP will pay the student stipend through a date in late spring. The mentor and their home department shares the cost of the spring semester tuition and fees with the MSTP, and is responsible for all tuition, fees, and stipend in subsequent semesters until the student completes the PhD.

5. Training Program and Thesis Committee

The student must enter a PhD program in which the mentor is an approved trainer. Some advisors may hold appointments in more than one department or program. In this instance the student may choose which program to join, in consultation with the thesis mentor.

Each student will form a thesis committee in consultation with their PhD mentor during the first year they join the lab. At least one member of the MSTP Steering Committee and one MD or MD/PhD will serve as members of the thesis committee. The student should inform the MSTP office of the members and chair of the committee. The committee should meet at least twice per year. A copy of each thesis committee report should be sent to the MSTP office. The committee chair, who usually writes the report, will be responsible for providing this to the MSTP. The MSTP Steering Committee member and the chair of the thesis committee will serve as liaisons to the MSTP.

MSTP thesis projects should be research-based and hypothesis-driven, not a mere survey or descriptive analysis. Students are expected to tackle substantial, cutting-edge PhD projects. The PhD project must have significant goals and meet the requirements for a PhD in the graduate program in which the student is enrolled.

MSTP students do have some special circumstances, since they must spend 4 years in medical school as part of their program. The PhD mentor is encouraged to help the student select a project that has realistic though substantial goals, and the mentor should provide close guidance to insure timely progress. Due to the 7-year limit (and possible 3 year extension) for completion of steps I, II, III of the USMLE, there may be significant consequences for medical licensure procedures if the student takes longer than four years for completion of the PhD phase.

6. Stipends and Tuition/Financial Responsibility

MSTP mentors are financially responsible for the stipends of MSTP students (\$35,000 per year, as of 7/1/2023). It is expected that this support will begin between May 1 and July 1 in the start of the third year (first year in the graduate phase), or as noted on the Mentor Agreement form, and continue until the date when the student returns to the MD curriculum (including any gap between the time of the thesis defense and the start of the MD curriculum- the student should continue lab work, writing, etc during this period).

Tuition support and health insurance must be provided for all MSTP students during the PhD thesis phase by the mentor or by the department where the faculty member has their primary appointment. Some departments cover tuition costs, but the mentor must confirm such arrangements. Tuition will be paid by the mentor/home department starting with the spring semester of year 2 in the MSTP.

In the event that a mentor loses funding during the course of PhD study, the home department (department in which the mentor has their primary appointment) is expected to support all trainee

expenses. The mentor and the home department are responsible for supporting the student until the student completes the PhD, is dismissed from the PhD program or switches to another laboratory. This period of support may include the time necessary for the student to rotate in another laboratory if the change is necessitated by actions taken by the mentor (departure of a mentor or other circumstances).

The MSTP does not cover tuition, health insurance or stipends for students during the PhD phase of the program. The mentor/home department is responsible for these expenses until the date when the student resumes medical school.

MSTP students may be supported by the MSTP NIH T32 training grant for up to four years of medical school. MSTP students are eligible for up to 2 additional years of NIH training grant support. Normally PhD students are allowed 5 years total support, but MSTP students can obtain one additional year of NIH support, or 6 years total. (However, the MSTP must apply for an extension before the onset of the 6th year.) In sum, this would allow MSTP students to be supported on other (non-MSTP) NIH training grants (or individual NRSA awards) for up to two additional years. **If a student will be supported by a NIH training grant or NRSA award during the PhD thesis phase, the mentor and student must contact the MSTP Director and indicate the source and duration of this support. Under no circumstances should a MSTP student be supported by a T32 training grant for more than two years of the PhD phase.**

We encourage students to apply for individual NRSA F30/F31 MD/PhD fellowship awards, which will help their mentor by providing additional support for their PhD phase, provide the student with the prestige of obtaining this award, and potentially fund a portion of the M3-M4 medical school expenses. The cap of two years of PhD phase support may apply here as well. For an NRSA F30/F31 MD/PhD fellowship award, however, the budget issues are more complex and may provide an extra opportunity. If the NRSA award will fund part of the MD phase (e.g. Med year 3) as well as the PhD phase, it may be possible for the Director to make an exception to the two-year limit on PhD phase pre-doc support by finding other funds to support Med year 4, allowing up to three years of support for the PhD phase. This option must be evaluated on an individual basis, since it will depend on projected financial resources at that time.

In summary, Mentors and students must contact the MSTP Director before applying for an NRSA award so as not to jeopardize the funding for the student's support for Med years 3 and 4. Mentors and students must notify the MSTP office of the exact period of any support on any T32 training grant during the PhD phase (maximum allowed = 2 years). Failure to follow these rules will threaten our ability to support a student in Med years 3 and 4.

7. Participation in the MSTP Program

MSTP mentors should participate in program activities as much as feasible. Reasonable goals are listed below.

Expectations for MSTP training faculty *without* an MSTP student doing a PhD thesis in their lab:

- Willingness to take on students for rotations if space is available in their lab.

- Recruitment of new MSTP students to the program, including interviewing of MSTP candidates and willingness to participate in recruitment activities.
- Service on MSTP dissertation committees.
- Participation in Graduate Student and Medical Student research symposia.

Expectations for MSTP training faculty *with* an MSTP student doing a PhD thesis in their lab:

- All of the above
- Occasionally attend MSTP programmatic activities, e.g. the monthly Wednesday evening MSTP meeting
- PhD mentors should also encourage their students to participate in all program activities, including MSTP monthly meetings, summer retreat, and graduate and medical student research symposia.

8. Expectations for Mentors to Ensure Student Progress and Completion of Publication Requirements

Students are responsible for driving their PhD progress, but mentors are also responsible for promoting this progress and taking appropriate steps to address any deficiencies in progress EARLY enough that the situation can be most efficiently remedied. If problems arise with a student, the mentor is encouraged to contact the MSTP Director.

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, aiming 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 at least one publication a year or more prior to their expected PhD completion, 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.

9. Transition of Students into the PhD Phase in Spring of Year 2 and Financial Responsibilities of Mentors and the Mentors' Home Departments

The transitions and financial arrangements for MSTP students as they matriculate in their PhD home departments in spring of year 2 are detailed on the mentor agreement form (see Appendix). This text explains related issues to answer questions that may arise.

- a. In spring of year 2, MSTP students enroll in one 3-4 credit course in their field of study (beginning in January) and 601 in their graduate program to total 9 credits.
- b. Students should add laboratory work to their schedule in the spring semester of year 2 after completion of the MD classes and USMLE Step 1.
- c. Following completion of the medical school curriculum in March, students may take a maximum of 8 weeks off for board exam studying. The board exam must be completed by the end of April, and students must begin full-time work in the lab no later than May 1.
- d. Apportioning of support for the spring semester of year 2 is tricky, since the transition to the PhD phase occurs in the course of a semester. Recognizing that the student has already committed to the mentor's lab and is starting in the graduate program and in the lab, it has been policy that the PhD mentor/home department shares the costs of training with the MSTP for that semester.
- e. In the spring semester of year 2, the mentor or mentor's department pays for the student's tuition and fees. The MSTP pays the student stipend until the end of the student's training grant appointment, which is two to four months past the end of the MD curriculum.
- f. Note that 21-24 graded credits toward the PhD will have been accomplished prior to the spring year 2 semester (advancement to PhD candidacy requires a minimum of 24 graded credits and 36 total credits). Thus, MSTP students come with a large proportion of their PhD credits already paid for by the MSTP, enhancing the financial advantage for the mentors and home departments.

Note: The MSTP provides an individualize Mentor Agreement for to each trainee and mentor at the time of PhD placement.