This handbook describes the organization of the University of Minnesota Medical Scientist Training Program (referred hereafter as "the Program") and is intended to help students become familiar with the Program and conduct their studies in a productive fashion. The guide therefore represents the current policies governing the Program. These policies may evolve, and this guide may be amended on a yearly basis. Under the terms of the University of Minnesota Program Agreement governing the administration of the Program, the Program Director has the authority to interpret or change existing policies. The Program Director will be available for discussion and clarification regarding any aspect of the Program.

It is the policy of the University of Minnesota to support the equality of educational opportunities.

All MSTP students are responsible for knowing the content of this handbook and complying with policies and practices.

Details concerning the general regulations and organization of the Medical School and the Graduate School are included in the respective University of Minnesota handbooks. The information summarized in these handbooks is an extension of policies in place for students in the Medical Scientist Training Program at the University of Minnesota.
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University of Minnesota MSTP Policies and Practices 2017-2018
Updated 9/13/2017
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The MSTP Policies and Practices was updated on September 13, 2017. It is subject to change without notice, as is the information accessible via the handbook’s embedded hyperlinks.
University of Minnesota
Medical Scientist Training Program (MD/PhD)

Mission Statement

The mission of the University of Minnesota Medical Scientist Training Program (MD/PhD) is to train a diverse group of intellectually gifted students to become physician-scientists and leaders in the global effort to preserve and restore human health.
University of Minnesota
Medical Scientist Training Program (MD/PhD)
Physician Scientist Code of Ethics and Professionalism

To be a responsible physician by:
- Becoming effective listeners, in order to gain the patient’s perspective.
- Encouraging the exchange of knowledge with colleagues, patients, and the community.
- Gaining a deeper understanding of the cultural and socioeconomic context in which each patient is experiencing their illness, so that we can respond to their needs for care appropriately.
- Respecting the autonomy of the patient.
- Embracing the principle of nonmaleficence.
- Learning to advocate for the patient in a time of uncertain and non-uniform coverage of care.
- Respecting the privacy and confidentiality of every patient.
- Learning to work effectively with a team of health care workers.
- Upholding high standards of conduct, such that we will not tolerate inappropriate or discriminatory behavior towards anyone on the basis of race, gender, religion, sexual orientation, or differing cognitive or physical abilities, in ourselves or in others.

To be a responsible scientist by:
- Becoming intimately familiar with the previous and current literature in our area of study, so as to increase the efficiency and relevance of our own work.
- Developing a deeper understanding of the scientific process, to allow a critical analysis of research outside of our field of focus.
- Being honest in our representation of the data we collect, and of its meaning, while also giving credit to others who have contributed intellectually or physically to its discovery.
- Respecting the lives and being personally responsible for the humane care of animals that we use in our research, as well as looking for ways to reduce the numbers of animals used.
- Ensuring the just selection and treatment of human subjects, as well as a true informed consent.

To excel as physician scientists by:
- Contributing to the advancement of our chosen field of research.
- Developing the skills and experience for successful collaboration with both full-time clinicians and basic scientists.
- Becoming translators between the languages of basic science and clinical medicine, in order to bridge the gap between these two.
- Using the scientific method in our clinical problem solving, and modeling the practice of evidence-based medicine.
- Drawing from our clinical experiences to focus on those things that will have the most impact on improving human health.
- Becoming adept at effective time management, in order to best meet the many demands put upon us.
- Gaining sophistication in ethical reasoning as it applies to all aspects of science.
- Embracing a continuing commitment to excellence in all aspects of our training.

updated 2003
Contact Information

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Medical Scientist Training Program Office
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MMC 293
B681 Mayo Building
420 Delaware Street S.E.
Minneapolis, MN 55455
Tel: (612) 625-3680
Fax: (612) 626-5994
http://www.med.umn.edu/mdphd/

Medical School Student Support Services
B604 Mayo (MMC 293)
Tel: (612) 624-9608
Fax: (612) 626-4200
http://www.meded.umn.edu

University of Minnesota Graduate School
420 Johnston Hall
Tel: (612) 625-3394
Fax: (612) 626-7431
http://www.grad.umn.edu

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mphd-student@lists.umn.edu

MSTP Steering Committee E-mail:
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1. MSTP Office

The MSTP office is located in B-680/681 Mayo Building, housing workspace for the Assistant Director and the Program Assistant. The Director’s office is located in Room B628 Mayo Building. All official documents for inter- and intra-University communication should be routed through the MSTP office for appropriate handling. A study space for MSTP students is located in the Medical School Student Resources Room, B691 Mayo.

2. PROGRAM GOVERNANCE

2a. MSTP Executive Committee

The MSTP Executive Committee provides oversight of student monitoring and advising, and addressing programmatic issues within the MSTP and the Medical School critical to the mission of the MSTP. The Executive Committee meets at least quarterly and consists of the MSTP Director, MSTP Associate Directors, MSTP Assistant Director, Medical School Faculty Advisor for MSTP students, and MSTP Executive Committee Student Representative. Members of the Executive Committee are listed in the Appendix.

2b. MSTP Steering Committee

The MSTP Steering Committee evaluates applications, interviews applicants, provides guidance on MSTP policies, and provides a link between the MSTP and graduate programs. Members of the Steering Committee assist the Director, Associate Directors, and Assistant Director in ensuring the maintenance of academic standards through annual reviews of the progress of all students.

The Steering Committee is composed of health sciences faculty members from both basic science and clinical departments. The Director appoints all Steering Committee members and chairs the Committee. In the Director’s absence, Steering Committee meetings are chaired by one of the Associate Directors. Members of the Steering Committee are listed in the Appendix. The term of service for Steering Committee members is four years. Individuals may serve for more than one term, but these terms must be non-consecutive.

Student representation on the Steering Committee consists of two members of the MSTP Student Admissions Committee (one voting representative and one alternate).

2c. MSTP Student Advisory Committee

The mission of the MSTP Student Advisory Committee (SAC) is to improve the University of Minnesota MSTP by creating and overseeing opportunities for MSTP students to enhance their scientific and medical knowledge, develop relationships beneficial to their career development, and build a sense of community within the program. As the primary student-run oversight committee, members of the SAC help to organize all MSTP group social activities, develop new events and experiences that will benefit all MSTP students, as well as integrate and analyze ideas about new ways to improve our program from MSTP students, steering-committee members, internal faculty members and external review faculty.

The SAC consists of two members from each MSTP class (based on year of entry). Each SAC member serves for a two year term and identifies a MSTP student from his/her class to serve on the SAC upon conclusion of the two year term. A student chair is elected each year. MSTP SAC members are listed in the Appendix.
The SAC also supervises the activities of the following subcommittees:

- Monthly Meeting Subcommittee
- Social/Volunteer Events Subcommittee
- Newsletter Subcommittee
- Retreat Planning Subcommittee

2d. MSTP Student Admissions Committee

The MSTP Student Admissions Committee consists of MSTP students who are in the graduate phase of their training. At least one member of the Student Admissions Committee will interview a MSTP applicant during the formal interview day. Primary responsibilities for committee members are:

- Reviewing all application materials before meeting with an applicant
- Interviewing 1-2 applicants on each of the program’s interview days, as well as escorting them to and from the interview if possible.
- Completing an evaluation form for each applicant interviewed that will go into the applicant’s file.
- Meeting with members of the student admissions committee within a few days after each interview day to discuss the applicants. The student committee formulates a recommendation for each applicant that is brought to the MSTP Steering Committee.

It is not essential for all committee members to be present on all MSTP interview days but the expectation is that committee members will coordinate their schedules to fit the interviews and will not miss a day unless absolutely necessary. Anytime a day needs to be missed, the committee member should let the Assistant Director know well ahead of time so arrangements can be made for another student to conduct the interview.

3. FINANCIAL ASSISTANCE

Students are financially supported throughout the duration of their formal training in the MSTP, contingent upon satisfactory progress in meeting the requirements and fulfilling the responsibilities of each training phase. Several mechanisms exist to monitor progress and to determine whether the student is meeting the requirements of the Program. These are defined in Section 19. A written contract between the student and the Program forms the basis for support being awarded on a yearly basis. Annual renewal of this contract is governed by the following guidelines:

3a. General Policies

Subject to the availability of funds, financial support of a student who is progressing satisfactorily in the Program is renewed each year. Financial support will be terminated if satisfactory progress is not made. The present stipend level for MSTP students is $30,000/year. For students on NIH-funded fellowships, the NIH-mandated stipend is supplemented from other funds to reach the stipend level appropriate for the student’s status in the program. The stipend during the graduate phase is paid at a level equal to that of other graduate students in the chosen graduate program or equal to the amount paid to incoming MSTP students during that year, whichever is greater.

Students are also awarded payment of tuition and all required fees while in Medical School. The Program does not pay for "optional fees" assessed by the University to support student groups. These optional fees are automatically posted to student accounts whenever tuition charges are present. Students may opt out of paying these fees, but action must be taken by each student early in the semester to avoid these charges. Assistance on how to opt out will be sent to each student by the Medical School, or students may stop by the MSTP office for assistance. In the graduate phase, MSTP students are governed by the rules of
their chosen graduate program and may be required to pay fees during this time. Clarification about whether a specific graduate program provides assistance to cover required University fees should be obtained directly from individual graduate program offices.

3b. Health Insurance

While in Medical School, MSTP students are eligible for two distinct University of Minnesota sponsored health insurance plans, the Graduate Assistant (GA) Health Plan and the Academic Health Center Student Health Benefit (SHB) Plan. Students will be given the opportunity annually while in Medical School to choose between the GA plan and the SHB plan. The GA and SHB plans provide similar coverage, but the coverage provided is not identical. In very general terms, the upfront cost of the GA plan is higher than SHB, but costs for actual care are higher for SHB than GA. See the Summary of Coverage for each of these plans (GA, SHB) for specifics on coverage and the costs associated with each plan.

Some general points about the two plans are listed below. Again, specifics for each plan should be reviewed at the Summary of Coverage for each plan (GA, SHB):

1. **Care location.** The SHB plan may be more cost effective for students who will receive care primarily on-campus at Boynton Health Services. There is also a broader network available but at additional cost. Coverage can also be obtained at out-of-network locations. The GA plan has a less complicated in-network/out-of-network structure.

2. **Upfront cost to students (i.e. premium charges).** The University requires enrollees in the GA plan to pay 5% of the premium cost. This 5% is each student's responsibility and cannot be paid by the Program. This charge is normally posted to the student's University account in Fall and Spring semesters. There is no student-paid portion of the SHB plan premium.

3. **Co-pay vs. co-insurance.** SHB plan charges are based on a co-insurance rate. The GA plan primarily charges co-pays with occasional co-insurance charges, depending on the service.

4. **Deductible.** The SHB plan has no deductible. The GA plan has a $200 deductible for out-of-network expenses.

5. **Total out of pocket costs.** In 2014-15, this limit was $6,250 for the SHB plan and $2,500 for the GA plan.

6. **Dependents.** Both plans allow for enrollment of dependents for an additional fee (paid by student).

7. **Dental insurance.** Separate dental insurance registration is required for the SHB plan. This is paid by the MSTP, but students are required to fill out the registration paperwork to activate coverage. The GA plan includes dental.

During the graduate phase, health insurance is provided in accordance with the policies and practices of the graduate program.

Information on health insurance is available at the following websites:

- AHC Student Health Benefit (SHB) Plan: https://shb.umn.edu/health-plans/shbp-home
- Graduate Assistant (GA) Health Plan: https://shb.umn.edu/health-plans/gahp-home

3c. MSTP Responsibility for Support

The Program supports the student during the time they are registered in Medical School. Funding is initiated on or about July 1 prior to the formal start of Medical School classes. This period before the start of Medical School classes is spent in a full time laboratory rotation. Funding by the Program continues through the first two years of Medical School. Students will complete clinical rotations at the end of the
second year (see section 12. Curriculum) and will be supported by the Program through the last official day of these rotations. The second phase of the Program’s responsibility for support begins the first day the student enters clinical rotations following completion of their PhD thesis. Stipend support will be provided for the total number of credits/weeks of clinical rotations completed plus 12 weeks of program allowances and 1 week for graduation week. Students who choose to spend time abroad (i.e. international travel) must check with the Program to determine whether they are still eligible for financial support.

Funding for student tuition, fees, insurance, and stipend comes from a variety of sources, including the National Institutes of Health Medical Scientist Training Program Grant, the Mayo Graduate Education Scholarship Fund, the Bakken/McKnight MD/PhD Endowed Scholarship Fund, University Fellowships, and the Medical School Dean’s Office. Assignment of the funding sources is at the discretion of the Program Director and Assistant Director.

3d. Mentor/Graduate Program Responsibility for Support

Upon completion of the initial two-year medical school training phase, financial responsibility shifts from the MSTP to the student’s mentor/graduate program. The funding becomes the responsibility of the student’s chosen thesis advisor. It is the student’s responsibility to consult with his or her mentor and graduate program to determine the policies on stipend, tuition and fees support. The source of support can come from the mentor’s grants, individual fellowships, training grants, or graduate program support. Although mentors are aware of their overall responsibility for providing stipend support for the duration of the graduate training phase, all students should be proactive and responsible for their own funding. This element of financial responsibility continues through the duration of the graduate training phase, independent of how long it takes the student to complete the requirements for the PhD (i.e. until successful completion of the thesis defense).

3e. Internal and External Funding for MSTP Students

The Program expects MSTP students to apply for internal and external predoctoral fellowships, particularly NIH F30/F31 awards. Information on NIH F30/F31 awards is available online at https://researchtraining.nih.gov/programs/fellowships. Students should plan to submit applications no later than the end of the first year of graduate training. Resources to assist students in the development of these fellowship applications are available from the Director or Assistant Director. The Program office should be notified of any applications submitted for fellowships. If the awarded fellowship is less than the MSTP stipend, the Program will supplement the external award to the Program stipend level (while the student is enrolled in Medical School). In those cases where the fellowship itself is greater than the MSTP stipend, the student is entitled to the entire amount. MSTP students may not engage in any other type of external employment (i.e. other than the MSTP) without prior permission of the Director.

4. PAYBACK REQUIREMENTS

Students who matriculate in the MSTP receive a stipend, tuition and support for fees and healthcare throughout their training. In the event that a student voluntarily leaves the Program, he/she may be required to pay back the funding received from the MSTP, either in part or in full. A specific example wherein payback is automatically collected is recovery of tuition from the Medical School semester during which the student voluntarily withdraws from the Program.

5. INSTRUCTION IN THE RESPONSIBLE CONDUCT OF RESEARCH
Responsible conduct of research is defined as the practice of scientific investigation with integrity. It involves the awareness and application of established professional norms and ethical principles in the performance of all activities related to scientific research. The MSTP adheres to the principles that responsible conduct of research training is an essential component of MSTP training, and that active involvement in the issues of responsible conduct of research should occur throughout a physician scientist’s career.

In addition to the ethics training provided to all medical students and to graduate students in specific graduate programs, MSTP students must complete two additional RCR training components. First year MSTP students must complete the core Responsible Conduct of Research (RCR) curriculum offered by the Office of the Vice President for Research. A description of this training can be found at http://www.research.umn.edu/compliance/education.html. This training is arranged by the Assistant Director during a student’s first year in the Program.

The MSTP also offers one-hour interactive RCR workshops on the following topics:
- Policies regarding human subjects in research
- Policies regarding live vertebrate animal subjects in research
- Mentoring and mentor/mentee responsibilities and relationships
- Responsible authorship, publication and peer review
- Data acquisition and management
- Conflict of interest (personal, professional, financial), intellectual property, and the scientist as a responsible member of society

A total of three workshops are offered each summer. Each topic is offered every other summer. MSTP students must attend each workshop by no later than the end of their fourth year in the program.

MSTP students must also attend a RCR Refresher Workshop in order to be sure that RCR instruction occurs at a frequency no less than once every 4 years. This RCR Refresher Workshop should be taken between the third and fourth year of the graduate phase.

6. LABORATORY ROTATIONS

The purpose of a laboratory rotation is to acquaint students with research opportunities in the laboratory research environment of a MSTP preceptor. The rotations do not constitute a course, and students will receive no credit toward either the MD or PhD degree for this requirement. The following guidelines apply:

1. All students are expected to complete a minimum of 2 laboratory rotations with different MSTP preceptors by the end of Fall semester of Medical School year 2. The first rotation occurs in the summer prior to the start of Medical School year 1. Students are also expected to complete 1-2 rotations between the middle of Medical School year 1 and the beginning of Medical School year 2.

2. Each rotation should be at least 4 weeks in length. When Medical School classes are not in session, students are expected to spend full-time in the laboratory.

3. Before committing to a rotation, students should evaluate potential preceptors and their research programs. Students should utilize the following resources:
   a. M1/M2 Research Meeting faculty presentations
   b. The MSTP website and websites of MSTP partner graduate programs
   c. Other MSTP students
d. Meet with the Director and/or Associate Directors

e. Meet with Directors of Graduate Studies of MSTP partner graduate programs

f. Attend graduate program seminars and events. A list is available on the MSTP website at [http://www.med.umn.edu/education-training/medical-scientist-training-program-mdphd/events/graduate-programs-institute-activities-seminars](http://www.med.umn.edu/education-training/medical-scientist-training-program-mdphd/events/graduate-programs-institute-activities-seminars)

g. A list of current MSTP students and the faculty members that each student rotated with is available in the Appendix. Students are encouraged to discuss potential rotations with other students in the program.

h. PubMed. Assess not only the productivity of the lab, but the productivity of graduate students who have trained in the lab.

i. NIH Reporter

4. It is also important to meet with faculty individually to discuss the possibility of a laboratory rotation. All first year MSTP students are expected to meet with at least 4 different MSTP preceptors during the fall and spring semester of Medical School year 1. Students should be sure to get clarification from faculty members regarding the faculty member’s interest in having a rotation student, potential projects available for a new graduate student, and availability and duration of funding for a new graduate student. Students are responsible for having a clear understanding of what each preceptor expects during a rotation. For example, will a rotation student learn a specific laboratory method, conduct a small project, conduct a literature search, or write a paper? In turn, students should make certain to communicate their expectations to the preceptor. The most productive rotations occur when student and preceptor are on the same page regarding goals and expectations.

5. Selection of rotations is a joint decision made by the student and the program. In order to finalize a rotation, students must follow this procedure:
   
   a. Submit to the Director a list of at least four faculty members, in order of preference. For each faculty member, provide a one paragraph statement outlining when the student met with the faculty member, and the reasons for wanting to conduct a research rotation with the faculty member. Students should submit this list no later than June 1 for the first rotation (prior to the start of Medical School year 1) and no later than April 1 of Medical School year 1 for the following 1-2 rotations. Students will discuss their faculty interest list with the MSTP leadership and finalize their rotation choice.

   b. The MSTP office will work together with the student to contact the faculty member and establish the guidelines and expectations for the rotation.

6. During the rotation, students will need to balance data generation versus compatibility testing. The rotation experience should be assessed in light of the following questions that need to be answered by the end of the rotation:
   
   - Are you excited about the research in the lab?
   - Do you like the lab environment?
   - Do you think you will have a productive working relationship with the faculty member?
   - Will the faculty member be your mentor and advocate?
   - Can you imagine spending 3-4 years of your life in this lab and enjoying it?

7. Following the completion of a rotation, students must submit a lab rotation evaluation to the MSTP office. The evaluation will briefly summarize the experience you had during the rotations.
7. M1 AND M2 RESEARCH MEETINGS

The MSTP M1 and M2 Research Meetings aim to promote the intellectual involvement of first and second year MSTP students in research, provide a venue for students to learn of the many exciting research opportunities at the University of Minnesota that might be suitable for subsequent PhD thesis research, and to develop key research and professional development skills that will promote a successful transition to the graduate phase and overall career development as a physician scientist. The meetings are a combination of:

- Research and professional skills development activities
- Discussion of past research accomplishments, opportunities for future thesis projects and career development by MSTP faculty preceptors
- Student-led discussion of research articles from the scientific literature in a journal club format

The complete schedule is posted online at https://docs.google.com/document/d/1TaFPeOZqU5LGngU9pF2icCoqA091k42Y9rNm_S325Do/edit. The Moodle site contains all of the relevant files and resources.

The M1 and M2 Research Meetings are held each Monday at 12:15 PM. All first- and second-year MSTP students are required to attend.

8. SELECTION OF PHD THESIS ADVISOR

Selection of the PhD thesis advisor is the most important decision made by a MSTP student during his/her tenure in the Program. The Director and Associate Directors are available to advise students at any time regarding this important decision. Students must be proactive in determining that the laboratory of their choice has adequate grant support to cover the cost of their stipend and lab support.

8a. MSTP Student Research Commitment Statement

A PhD thesis advisor and graduate program must be declared no later than January 1 of the second year in Medical School. As part of this process, each student must submit a request for approval to the Director in the form of a detailed MSTP Student Research Commitment Statement. Advisor and laboratory selections are not officially approved without the Director’s permission. The Research Commitment Statement should include the following:

1. Describe each laboratory rotation, including the nature of the project worked on, the methodologies employed and the outcome. The dates and approximate amount of time you were able to work in the laboratory should be included. Comment on the pros and cons of an individual laboratory as a choice for graduate training.
2. Indicate your mentor choice and the graduate program you have selected.
3. List the required coursework in your graduate program and electives you may take. Indicate whether you will have teaching responsibilities.
4. Describe the nature of the research project you plan to pursue during the graduate training phase.
5. Describe your preceptor’s current and projected grant support that will provide the financial support for your research. Comment on plans for submitting individual fellowship applications during your PhD training.
6. Provide a copy of your proposed advisor’s NIH biosketch.
7. Provide a copy of your proposed advisor’s NIH “Other Support” information.
A Graduate Phase Transition Meeting is held no later than January/February of the second year where advisor choices and graduate programs are finalized with the Director, Associate Directors, Assistant Director, and select Steering Committee members.

8b. Expectations and Responsibilities of MSTP faculty preceptors

The MSTP has established the following expectations and responsibilities for MSTP faculty preceptors:

- Active, externally funded research program that is suitable for rigorous PhD training. The MSTP’s expectation is that MSTP students will pursue rigorous PhD training that will be completed within 4 years and will result in a minimum of one first-authored paper published or in press prior to thesis defense. The MSTP also expects faculty preceptors to encourage and assist MSTP students in submitting a NIH F30 fellowship application (or equivalent) by no later than April of the second year of the PhD graduate phase.

- Track record of successful training of predoctoral students, postdoctoral trainees and/or medical fellows. This expectation does not preclude junior faculty with a less established track record of direct mentoring of MSTP students from becoming MSTP preceptors. However, junior faculty preceptors who mentor a MSTP student may be asked by the MSTP to establish a formal co-advising relationship with a senior MSTP preceptor and will meet on an annual basis with the student and MSTP leadership as part of the student’s annual Individual Development Progress Report meeting.

- Participation in MSTP activities in addition to direct mentoring of an MSTP student in the PhD graduate phase, such as membership on MSTP student thesis committees, accepting MSTP students for laboratory rotations, serving as a Clinical Continuity mentor (for MD or MD/PhD faculty only), interviewing and recruiting MSTP applicants, participating in MSTP Responsible Conduct of Research training, and service on the MSTP Steering Committee or other faculty committees.

- Completion of the University of Minnesota Clinical and Translational Science Institute’s free, online, professional development course, entitled “Optimizing the Practice of Mentoring” – http://z.umn.edu/mstpmentoring. This online course takes 90-120 minutes to complete and should be completed before applying to become a preceptor.

Faculty interested in becoming a MSTP preceptor submit an application that consists of:

- Cover letter containing a written statement outlining the faculty member’s interest in and qualifications for being a MSTP preceptor. This cover letter should also confirm that the faculty member has completed the “Optimizing the Practice of Mentoring” online course.
- NIH biosketch or CV
- Other Support (NIH format)
- Letter of support from a current MSTP preceptor (https://www.med.umn.edu/education-training/medical-scientist-training-program-mdphd/research-opportunities/faculty-research-preceptors)

Applications for faculty preceptor status are evaluated by the MSTP Executive Committee.

9. SELECTION OF GRADUATE PROGRAM

At the time of the selection of a PhD advisor, students will also need to identify the graduate program that they will join during the graduate phase. MSTP students may choose among the following graduate programs:

- Biochemistry, Molecular Biology & Biophysics (BMBB)
- Biomedical Engineering
The selection of a graduate program is dependent on the graduate program affiliation(s) of the chosen PhD thesis advisor. If the student’s advisor is affiliated with more than one of the graduate programs listed above, the student will need to select one program to join. Each graduate program has specific requirements for MSTP students and they can and do differ between programs. Students can consult their advisor and the MSTP Director for guidance on this selection.

Students do not need to apply for admission to their selected graduate program. This is handled by the MSTP office.

9a. Graduate Student Resources

The University of Minnesota has a number of resources and student organizations that provide support for graduate students. Links to these resources can be accessed through the following webpages:

- Graduate School Diversity Office
- Graduate School Academic and Professional Development

10. REGISTRATION

During the first two years of Medical School, course registration is handled by the Medical School Student Affairs office. Additional information on registering for clinical rotations can be found in section 11. Curriculum. While in Graduate School, students are responsible for class registration and health insurance enrollment. Check with your graduate program office for details. Please keep in mind that the fall semester deadline for Graduate School registration will be either spring semester, or a later registration period that occurs in late August/early September. It is important for students to maintain full-time registration during every semester, including summer. Failure to do so will result in FICA and Medicare payments being withheld from stipend checks and can create problems with health insurance eligibility. Also, the Graduate School requires that you register in the fall and spring semesters in order to maintain active status as a graduate student. Failing to do so will require that you complete readmission paperwork and pay a fee. Please contact the MSTP office if you have any concerns or questions about registration.

11. CURRICULUM

MSTP students are required to complete the standard course work for both the MD and PhD degrees, plus the following:

11a. USMLE Step 1 exam
Students are expected to take the USMLE Step 1 exam within 6-8 weeks following the conclusion of year 2 medical school classes (typically, end of May to mid-June). Student perspectives on appropriate preparation and resources for Step 1 can be found in this Google survey.

11b. Clinical rotation(s) at the end of year 2

Students are expected to complete a minimum of one required clinical rotation following completion of USMLE Step 1 during the summer prior to starting Graduate School. Registration for these rotations is handled by the MSTP office. Students must contact the Assistant Director in February of Year 2 of Medical School to make their rotation requests.

The following is the list of rotations that students can choose from:

- Medicine I (8 weeks)
- Pediatrics (4 weeks)
- Surgery (8 weeks)
- OB/Gyn (4 weeks)
- Psychiatry (4 weeks)
- Neurology (4 weeks)
- Family Medicine (4 weeks)

The selection of specific clinical rotations will depend on the clinical interests of the student and should be made in consultation with Program leadership.

11c. Clinical Continuity and Mentoring Program

The Clinical Continuity and Mentoring Program has the following goals:

- To train physician scientists who possess superior skills in both the clinical subspecialty area and research area
- To maximize the credentials of our MSTP students for matching in top-tier academic, research-focused residencies and physician scientist training pathways
- To develop a longitudinal clinical experience for physician scientists that informs their research careers and clinical careers.
- To develop longitudinal mentoring relationships with physician scientists in our University Community who care for patients and generate new knowledge through research

The program consists of the following courses that are completed by all MSTP students:

- Clinical Continuity Experience for Physician Scientist 1 (INMD 7542) – 3 credits
  - This course is completed in the second year of the graduate phase and involves one-on-one meetings between the student and the Clinical Continuity mentor totaling 16 half days during the academic year.
  - Mentors will provide ongoing clinical experiences, teach clinical care skills, and expose the student to translational research questions that occur in the clinic. Meetings may involve any number of activities, including clinical rounds, attendance of a clinical translation conference, or interactions with other faculty to meet a specific pedagogic goal.
  - Students will prepare and present a MSTP Grand Rounds presentation as part of this course.
  - Specific course objectives:
    - Maintain/develop basic clinical skills
    - Integration of the MSTP student into the academic culture of the mentor’s department
    - Observe mentor during leadership functions
    - Learn time management skills
Clinical Continuity Experience for Physician Scientist 2 (INMD 7545) – 3 credits
- This course is completed in the third year of the graduate phase and involves one-on-one meetings between the student and the Clinical Continuity mentor totaling 16 half days during the academic year.
- Mentors will provide ongoing clinical experiences, teach clinical care skills, and expose the student to translational research questions that occur in the clinic. Meetings may involve any number of activities, including clinical rounds, attendance of a clinical translation conference, or interactions with other faculty to meet a specific pedagogic goal.
- Students will submit a 1 page concept proposal in the form of an NIH Specific Aims page outlining a set of experiments to address a disease-based hypothesis as part of this course.
  - The educational objective of the NIH Specific Aims is to encourage the student to recognize an unanswered and important question in the clinical setting, then propose specific basic or translational experiments to address that question. This activity is intended to capture the essence of being a physician scientist.
  - Two online videos from Northwestern University discuss how to construct a Specific Aims page: Video 1, Video 2
- Specific course objectives:
  - Maintain/develop basic clinical skills
  - Integration of the MSTP student into the academic culture of the mentor’s department
  - Observe mentor during leadership functions
  - Learn time management skills
- See Clinical Continuity Expectations and Responsibilities, and Student-Mentor Contract

Clinical Foundations for the Physician Scientist (INMD 7548) – 4 credits
- This course is completed during the final year of the graduate phase and involves one-on-one meetings between the student and the MSTP clinical mentor in the clinic totaling 18 half days over one semester. This will be a hands-on clinical experience.
- Completion of INMD 7548 will fulfill the Medical School's Primary Care Selective Requirement.
- Specific course objectives:
  - Develop and refine patient evaluation and management skills, include H&P skills, patient write-ups, oral presentation, scientific basis of patient’s disease
  - Learn to develop disease mechanism hypotheses
  - Completion of a Quality Improvement (QI) on-line course and 1-page QI project proposal.
    - The online course includes classes QI 101-104 (15 total lessons) provided by the Institute for Healthcare Improvement. The student will need to create a username and password for the IHI website (free). The student should obtain a certificate of completion of these 4 courses from the IHI website and submit it to MSTP Assistant Director, Susan Shurson (sshurson@umn.edu).
    - The 1-page QI project proposal should be reviewed with the clinical mentor.
    - The educational objectives of the online Quality Improvement Modules and QI Project Proposal are to introduce the student to formal quality improvement methodologies, to encourage the student to identify an actual clinical situation in need of quality improvement, and then to propose a realistic QI project to address that situation.
- See Clinical Foundations Expectations and Responsibilities, and Student-Mentor Contract

Selecting a MSTP Clinical Continuity Mentor
Students will meet in the summer with one of the Associate Directors to discuss the student’s specific objectives for the clinical continuity experience and identify potential Clinical Continuity mentors appropriate for the student. Students may elect to work with the same clinical mentor over multiple years or work with a different mentor each year. Final pairing of students with a mentor will be made by MSTP leadership. Click here for the list of current clinical continuity mentors.

Responsibilities of the MSTP Clinical Continuity Mentor
- Provide meaningful recurring clinical/translational experiences for the MSTP student over a 12 month period of time.
- Monitor student progress in comfort in the clinical setting including History, Physical, Assessment and Plan and documentation.
- Consider including the student in academic activities such as clinical publications relevant to the student.
- Be responsible to the student.

Responsibilities of the MSTP student during Clinical Continuity:
- Work with the Clinical Continuity mentor to identify mutually agreeable time schedule for activities.
- Be prepared for clinical activities by reviewing the EMR prior to clinic.
- Engage in discussions that would be of benefit to the student’s career path.
- Work to avoid absences.

11d. Clinical Rotations and Transition from Graduate Phase into Year 3-4 Clinics
The Medical School requires students to complete 76 credits/weeks of clinical rotations. Of the required 76 credits/weeks, 6 or 12 may be taken as "research for credit" electives. In order to exercise this option, an "Elective in Research or Independent Study" form will need to be completed, which is available from the Medical Education web site at www.meded.umn.edu/year34/forms.php. Please note that the Medical School will not grant retroactive credit for previous work. Additional information on the procedure for the transition from the Graduate Phase into Year 3-4 Clinics is provided in Section 18.

12. QUANTITATIVE TRAINING REQUIREMENT FOR MSTP STUDENTS
The NIH requires that MSTPs provide appropriate graduate training in quantitative biology or advanced statistical approaches for MSTP students to pursue cutting-edge biomedical research. To meet this requirement, MSTP students must complete one of the graduate-level courses listed below. Students may contact the Director to determine if other courses not listed below would fulfill this training requirement.

**BIOC 5361 - Microbial Genomics and Bioinformatics**
(3.0 cr; Prereq-College-level courses in [organic chemistry, biochemistry, microbiology]; fall, spring, every year)
Introduction to genomics. Emphasizes microbial genomics. Sequencing methods, sequence analysis, genomics databases, genome mapping, prokaryotic horizontal gene transfer, genomics in biotechnology, intellectual property issues.

**BIOC 5444 - Muscle**
(3.0 cr; Prereq- 3021 or BIOL 3021 or 4331 or BIOL 4331 or PHSL 3061 or instr consent)
BIOL 5272 - Applied Biostatistics
(3.0 cr; = [BIOL 3272]; Prereq: One semester of college-level [[calculus or statistics or computer programming], general biology]; A-F only, fall, every year)

CSCI 3003 - Introduction to Computing in Biology
CSCI 5980 – Special Topics in Computer Science (grad level, held in conjunction with CSCI 3003)
(3.0 cr; spring, every year)

CSCI 5461 - Functional Genomics, Systems Biology, and Bioinformatics
(3.0 cr; Prereq: 3003 or 4041 or #; spring, every year)

CSCI 5481 - Computational Techniques for Genomics
(3.0 cr; Prereq: 4041 or #; fall, every year)

GCD 5005 – Computer Programming for Cell and Developmental Biology
(3.0 cr, starting fall 2014)
The use of computer programming in biology is rapidly expanding, and in this course students will build their own biologically-oriented computer programs. Typical applications of computer programming in cell and developmental biology are for computational modeling, automated image analysis, and for data analysis. The objective of this course will be to teach basic MATLAB computer programming skills, with applications designed specifically for students to learn how programming is used for modeling of biological processes, for advanced data analysis, and also for quantitative image analysis. Students will gain confidence in building their own code, as well as in applying published code to specific problems. Students who proceed to graduate school, medical school, or employment in industry will find programming a useful skill that will provide them a competitive advantage in the market.

MicE 8992 – Discovering Patterns in the Microbiome
(1.0 – 3.0 cr, starting spring 2016)
This class gives an introduction to analysis of microbial metagenomes. We will cover methods for analyzing marker gene sequences, shotgun metagenomics, and bacterial gene expression (metatranscriptomics). We will also explore the use of tools from machine learning, including feature extraction, clustering, and classification, to translate descriptive models into predictive models of microbiomes.

NSC 8320, Sect 17 – Neurostatistics
Offered every other fall

PUBH 6414 - Biostatistical Methods I

PUBH 6450 – Biostatistics I
(4.0 cr; =[PUBH 6414]; Prereq-[College-level algebra, health sciences grad student] or #; A-F only, fall, spring, every year)
Descriptive statistics. Gaussian probability models, point/interval estimation for means/proportions. Hypothesis testing, including t, chi-square, and nonparametric tests. Simple regression/correlation. ANOVA. Health science applications using output from statistical packages.

PUBH 6451 - Biostatistics II
(4.0 cr; Prereq-[[[6420, 6450] or [6414, 6415]] with grade of at least B, health sciences grad student] or #; spring, every year)
Two-way ANOVA, interactions, repeated measures, general linear models. Logistic regression for cohort and case-control studies. Loglinear models, contingency tables, Poisson regression, survival data, Kaplan-Meier methods, proportional hazards models. Geared towards trial and epidemiology cohort data analysis

PUBH 7445 - Statistics for Human Genetics and Molecular Biology
(3.0 cr; Prereq-[6450, [6451 or equiv]] or #; background in molecular biology recommended; spring, every year)
Introduction to statistical problems arising in molecular biology. Problems in physical mapping (radiation hybrid mapping, DDP), genetic mapping (pedigree analysis, lod scores, TDT), biopolymer sequence analysis (alignment, motif recognition), and micro array analysis.

PUBH 8446 - Advanced Statistical Genetics and Genomics
(3.0 cr; Prereq-[7445, statistical theory at level of STAT 5101-2; college-level molecular genetics course is recommended] or #; spring, every year)
Genetic mapping of complex traits in humans, modern population genetics with an emphasis on inference based observed molecular genetics data, association studies; statistical methods for low/high level analysis of genomic/proteomic data. Multiple comparison and gene network modeling.

STAT 5021 - Statistical Analysis
(4.0 cr; =[STAT 3011, ANSC 3011, ESPM 3012]; Prereq-=: 3011; College algebra or #; Stat course recommended; fall, spring, every year)
Intensive introduction to statistical methods for graduate students needing statistics as a research technique.

STAT 5303 – Designing Experiments
(4.0 cr; Prereq: 3022 or 4102 or 5021 or 5102 or instr consent)

ChEn 8754 – Analysis, Design and Synthesis of Biotechnological Systems
(3.0 cr)
This course is designed for graduate students from life sciences, chemical and physical sciences and engineering with keen interest in quantitative analysis and design of biological systems. The advances in
genomic science and the advances in high throughput transcriptional and translational analytical tools have made biological research data multi dimensional; one can possibly relate biological processes at molecular level to physiological event at cellular level or even at the organisms or population levels. The exploitation of those advances also requires us to deploy new analysis tools that were noted in different disciplines. This course aims to introduce methodology for analyzing data attained at a genomic level to their integration for interpreting physiological events. It emphasizes the conceptual appreciation of the quantification of molecular event that constitutes “chemical processes” in living systems.

GCD 8920/BIOL 5950 - Quantitative Fluorescence Microscopy
(3.0 cr)

Fluorescence microscopy is an indispensable technique in the Biological Sciences that is used for studying proteins and cells in their physiological state. While fluorescence microscopy is commonly employed for observing molecules or disease progression, its real strength lies in the ability to reveal quantitative information. The main goal of this course is to introduce the fundamental principles of fluorescence, fluorescence microscopy, and fluorescence quantification to extract maximal information from fluorescence experiments. The course will use ImageJ tutorials along with lectures to provide hands-on expertise in image analysis and interpretation. Students will gain both a broad understanding of fluorescence microscopy techniques.

13. GRADING POLICY

Students receive pass or no pass grades while in the first two years in Medical School. Honors are given to approximately the upper 10% of each class. Grades are recorded on an H (honors), E (excellent), S (satisfactory), I (incomplete), N (no credit, fail) during Medical School years 3 and 4. Students who receive I or N grades in courses will be reviewed by the Medical School Committee on Student Scholastic Standing (COSSS) Committee to determine a course of action.

The Graduate School uses two grading systems: A-F or S-N. Grades of A, B, C, and S are acceptable, but grades of S are not calculated in the grade point average. At least two-thirds of the credits completed in the Graduate School and included on any degree program (including a minor or supporting program) must be taken under the A-F system. The Graduate School also requires 7 semesters of full-time registration (7 or more credits per semester) or its equivalent, to include at least 24 doctoral thesis credits.

14. GRADUATE PROGRAM CREDIT TRANSFER

Selected courses from the MD curriculum have been approved for transfer to the Graduate School to fulfill certain graduate program credit requirements. Consult individual graduate programs for details as to which courses will transfer.

15. GRADUATE PHASE MILESTONES

The following are key milestones that must be reached in order to successfully complete the graduate phase of the MSTP:

- Completion of graduate phase coursework
- Pass written and oral preliminary exams
- Seek independent funding by submitting a NIH F-series predoctoral fellowship application (or equivalent) by no later than the end of the second year of the graduate phase
- Select thesis committee and meet with thesis committee every 6-12 months
- Present research at a minimum of two national/international conferences
- Publish at least one first-authored paper in a peer-reviewed journal prior to return to clinic
- Complete Clinical Continuity and Mentoring Program
- Present chalk talk at MSTP retreat (end of year 1 of the graduate phase)
- Present research seminar at MSTP Monthly Student Meeting (third year of graduate phase)
- Present clinical/basic science seminar
- Write, submit and defend thesis no later than the end of the fourth year of the graduate phase

16. ORAL PRESENTATIONS DURING THE GRADUATE PHASE

Physician scientists must be able to clearly convey research and clinical findings in a variety of oral presentation formats. The MSTP provides students with the opportunity to obtain experience with these various forms of oral presentations during the graduate phase. Students in the graduate phase give the following oral presentations:

- At the end of the first year of the graduate phase, students give a 10 minute “chalk talk” (no Powerpoint slides) on their thesis research. This presentation is given at the MSTP Annual Retreat.
- During the second year of the graduate phase, students give a MSTP Grand Rounds presentation as part of their activities in the MSTP Clinical Continuity and Mentoring Program. Information on MSTP Grand Rounds is provided in Section 17.
- In the middle of the third year of the graduate phase, students give a research presentation on their thesis research. This presentation is given at one of the MSTP Student Monthly Meetings.
- In the final year of the graduate phase, students give a MSTP Clinical/Basic Science Seminar in one of the existing research conferences held regularly by each Clinical Science Department in the Medical School. Additional information is provided in Section 18.
- The graduate phase culminates with a public PhD thesis defense. All MSTP students are strongly encouraged to attend this important MSTP milestone.

The diagram below outlines the oral presentations given by MSTP students during the graduate phase:

MSTP students are also encouraged to participate in the 3 Minute Thesis Competition and other events that focus on improving communications skills.

17. MSTP GRAND ROUNDS

MSTP Ground Rounds is a monthly case-based small group style discussion of a clinical problem and relevant state-of-the-art science. MSTP students will collaborate with their Clinical Continuity mentor to select and present a case that highlights the particular clinical problem and develop a “Morbidity and Mortality” style presentation of the case. Following the case presentation, the student and Clinical
Continuity mentor will lead the group in an interactive grand rounds style presentation of the current science aimed at understanding the highlighted clinical problem.

Specific objectives of MSTP Grand Rounds include:

- To highlight the impact of basic, translational and epidemiological research on prevention, detection and treatment of human disease
- To provide an opportunity for students to network with established University of Minnesota physician scientists in a field of interest
- To provide a regular venue for interaction among students, residents, fellows, and faculty interested in the application of basic research to clinical medicine

MSTP students in the second year of the graduate phase are required to give one MSTP Grand Rounds presentation as part of the “Clinical Continuity for Physician Scientists 1” course. MSTP students in other phases of training may volunteer to present a case presentation.

a. Preparing for a MSTP Grand Rounds presentation.

- Students preparing for a MSTP Grand Rounds presentation should select the clinical case in consultation with their Clinical Continuity mentor. MSTP leadership can also be consulted for advice with regard to the selection of the clinical problem. Examples of cases from the Department of Medicine can be obtained from Dr. Bitterman and Department of Pediatrics cases from Dr. Binstadt.

- In consultation with the Clinical Continuity mentor, select a day and time for the MSTP Grand Rounds Presentation. Notify Susan Shurson at sshurson@umn.edu at least three weeks in advance so that the MSTP Office can secure an appropriate room for the meeting.

- Develop the presentation in consultation with the Clinical Continuity mentor. There should be two components to the presentation:
  - Clinical case presentation (25 minutes) consisting of:
    - History
    - Physical exam
    - Initial imaging and laboratory information
    - Sequential release of information (in the sequence available to the primary MD team)
    - Engage the audience in analysis after each element of clinical data is presented
  - Interactive presentation of current science aimed at understanding the highlighted clinical problem (25 minutes)

- An example of a Grand Rounds presentation that represents the type of presentation expected for MSTP Grand Rounds is provided at the following link: Brad Miller, MD, PhD, “How Safe is Growth Hormone Therapy?”

18. MSTP STUDENT CLINICAL/BASIC SCIENCE SEMINAR

MSTP students in the graduate phase (generally in their final year) are required to give a formal presentation that bridges an area of basic research with a specific clinical problem. This presentation encourages independent thought by students regarding the future direction of experimentation in a topic area chosen by the student. The topic can be related to their thesis research, but should incorporate translational aspects of their thesis research that would be of interest to a diverse audience. Each student must arrange and present his or her own seminar; assisting another MSTP student with his or her seminar will not fulfill the requirement.
The educational objective of the Clinical/Basic Science Seminar is to provide an opportunity to present a lecture at one of the major divisional or departmental clinical conferences (e.g. Pediatrics, Medicine, Lab Medicine Grand Rounds; CIDMTR, Pulmonary, HOT research/clinical conference) in order to showcase the student's research accomplishments to the Division/Department.

The MSTP office will contact students about scheduling their seminar prior to completion of the graduate phase of the Program. Students should then schedule a meeting with Associate Director Dr. Bitterman to discuss the general topic area that will be covered in the seminar. Based on this discussion, Dr. Bitterman will schedule the seminar in one of the existing research conferences held regularly by each Clinical Science Department in the Medical School. Feedback is provided to the student by the clinical department head or the vice chair for research. All students are strongly encouraged to attend these seminars, especially students who have completed their second year of Medical School.

Students must complete the clinical/basic science seminar requirement before they return to medical school for clinical rotations. Third year medical school funding from the MSTP will not commence until this requirement has been fulfilled.

Examples of Grand Rounds presentations that represent the type of presentation expected for the Clinical/Basic Science Seminar are provided at the following links:

- Peter Gordon, MD, PhD, “New Strategies for Targeting Leukemia”
- Mark Osborn, PhD, “Gene Editing for Fanconi Anemia”

19. MSTP POLICY ON RETURNING TO CLINIC

The timing of re-entry into the clinical training phase is challenging and should not be underestimated. Careful planning on the part of the student and thesis advisor is essential. **Students must complete their thesis and contact the MSTP office before attempting to re-enter the clinical training phase.** This includes successful final oral defense of the thesis and submission of the final version of the thesis (i.e. approved by all graduate thesis committee members) to the Graduate School. **If the student anticipates a problem in meeting this requirement he/she must meet with the Director to explain the circumstance.**

The return to Medical School training after the time spent in the research phase is a significant adjustment that will require a large amount of each student’s time. Completion of the thesis before resuming full-time clinical training is a policy adopted by the MSTP in order to prevent the inherent time conflicts between clinical training and fulfillment of thesis requirements. Any student who returns to full-time clinical training without having completed his/her thesis or meeting with the Director will be pulled from the first rotation and each successive rotation until the thesis is defended. This delay may jeopardize the continuation of stipend support and may prevent the student from completing the required rotation(s) in time to graduate.

Medical School requirements for the clinical training phase include the following:

A minimum of 76 total credits/weeks (1 credit = 1 week) of clinical courses.

- 56 credits/weeks in the following required courses:
  - Foundational Clerkships (36 weeks)
    - Internal Medicine (MED 7500): 8 weeks
    - Family Medicine (FMCH 7600): 4 weeks
    - Neurology (NEUR 7510): 4 weeks
    - Psychiatry (ADPY 7500): 4 weeks
    - Pediatrics (PED 7501): 4 weeks
- Obstetrics/Gynecology (OBST 7500): 4 weeks
- Surgery (SURG 7500): 8 weeks
  - Advanced Clerkships (16 weeks)
    - Subinternship in Critical Care (INMD 79xx): 4 weeks
    - Emergency Medicine (EMMD 7500): 4 weeks
    - Advanced selectives (2 of 5, all 4 weeks):
      - Primary Care (INMD 7548/Clinical Foundations, FMCH7700, MED7700, MED7701 OR PED7700)
      - Pediatrics
      - Obstetrics
      - Psychiatry
      - Surgery
  - Intersessions (4 weeks)
    - 20 credits/weeks in electives
      - 8 credits/weeks minimum being direct patient interaction or “hands on”
      - 12 credits/weeks non-direct patient interaction or non “hands on” (may be fewer with more “hands-on” credits/weeks)
        - Students may take 6 or 12 credits/weeks as “research for credit” electives. In order to exercise this option, an "Elective in Research or Independent Study" form must be completed, which is available from the Medical Education web site at www.meded.umn.edu/year34/forms.php. Please note that the Medical School will not grant retroactive credit for previous work.

Although satisfactory completion of a minimum of 76 credits/weeks is required for the MD degree, students may register for a maximum of 85 credits.

<table>
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<tr>
<th>Required courses</th>
<th>Course #</th>
<th>Credits/weeks</th>
<th>After M2</th>
<th>Grad phase</th>
<th>M3/M4</th>
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<td>Family Medicine</td>
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<th>After M2</th>
<th>Grad phase</th>
<th>M3/M4</th>
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Clinical Continuity 1 | INMD 7542 | 3
Clinical Continuity 2 | INMD 7545 | 3

**Must have taken either Medicine I or Surgery**

For MSTP students, completion of clinical courses should occur as follows:

| Clinical rotation(s) at the end of year 2 | 4-8 credits/weeks |
| Clinical Continuity 1 and 2 completed during PhD phase | 6 credits/weeks |
| Clinical Foundations completed at end of PhD phase | 4 credits/weeks |
| Clinical rotations after completion of PhD (Years 3 & 4) | 58-69 credits/weeks |
| TOTAL | 76-85 credits/weeks |

In planning Year 3 & 4 schedules, MSTP students should also factor in the following program allowances:

| Vacation breaks (total during Years 3 & 4) | 4 weeks |
| Professional Development Time (preparation for USMLE step 2 exam, residency interviews) | 8-10 weeks |

19a. Transfer of PhD coursework credits
MSTP students may request up to 6 credits from their PhD program to transfer to the MD program as elective credits. These credits must be course credits, NOT thesis credits. Additional time in a laboratory setting beyond 6 weeks will not be transferred as elective credits that count toward fulfilling the elective graduation requirement. To request this transfer, MSTP students should complete and submit the form “MD/PhD Student Seeking Elective Transfer Research Credit” (available from the MSTP office), along with the syllabus of the relevant course(s), to the MSTP office.

19b. Financial Support During the Clinical Training Phase

Financial support by the MSTP for the clinical training phase begins the first day the student enters clinical rotations following completion of their PhD thesis. Stipend support will be provided for the total number of credits/weeks of clinical rotations completed plus 12 weeks of program allowances and 1 week for graduation week. Thus, the total duration of stipend support will be between 77 and 84 continuous weeks (64-71 credits/weeks for clinical rotations plus 12 weeks of program allowances plus 1 week for graduation week) during the clinical training phase.
Stipends for the clinical training phase provided by external fellowships (such as an NIH F30/F31) will be paid to the student in accordance with the requirements outlined by the funding agency and may include stipend support beyond the maximum 84 weeks described above. However, the total duration of any supplementation provided by the Program will be determined as described above (62-71 credits/weeks for clinical rotations during Years 3 and 4 of Medical School plus 12 weeks of program allowances plus 1 week for graduation week).

19c. Timing of Return to Clinic

Students should consult with the Assistant Director to carefully plan their M3 and M4 training sequence, as the exact timing is dependent on the total number of credits/weeks that will be completed in M3 and M4, the total number of credits/weeks that were completed following Year 2, and other objectives that the student wishes to complete during clinical training (such as away rotations and time for independent research). Careful planning is required if a student wishes to avoid a period between the end of stipend support and official graduation from Medical School. Although MSTP students may return to clinic at any time, in general MSTP students should plan to return to clinic sometime between July and the end of October.

19d. Submitting a M3/M4 Schedule Request

MSTP students who anticipate completing their PhD thesis and returning to clinic during the following academic year must:
1. Attend a mandatory meeting that will provide an overview of the schedule request process. This meeting is held in the fall of the year prior to the student’s anticipated return to clinic. In other words, a student planning to return defend their thesis and return in clinic in 2015 must attend this meeting in the fall of 2014, and begin thinking about their desired M3/M4 schedule in fall of 2014.
2. Meet with the MSTP faculty advisor to discuss the student’s plans for the M3/M4 years
3. After meeting with the MSTP faculty advisor, submit a M3/M4 Schedule Request (see below) by December 1

The M3/M4 Schedule Request should be prepared using the following format:

1. A cover letter (1 page should be sufficient) addressed to the MSTP leadership. Provide the following in the cover letter:
   a. Summarize the MSTP requirements that must be completed before returning to clinic and provide a timeline for the completion of these requirements. These include, but are not limited to:
      i. A minimum of one first authored paper published or in press
      ii. Successful defense of thesis and submission of thesis to Graduate School
      iii. Completion of required Clinical Continuity & Clinical Foundations courses
      iv. Research Presentations at the MSTP Retreat and MSTP Student Monthly Meeting
      v. Clinical/Basic Science Seminar
   b. Describe your physician scientist career goals, interests and objectives
   c. Provide a rationale for the schedule request that has been developed in consultation with the MSTP Faculty Advisor. Be sure to address the following:
      i. Any specific schedule issues that are relevant to your specific career objectives as a physician scientist
      ii. How any concerns about your Step 1 score have influenced the development of your schedule request
      iii. Identify your desired clinical “lane” for returning to clinic
iv. If there are large gaps in your schedule between clerkships, indicate what you will be doing during these periods.

v. Describe any plans you have for research activities during M3/M4.

vi. Any other issues relevant to your schedule request and your career development as a physician scientist

2. Complete the Year 3/4 scheduling worksheet (to be provided by the Director) with your clerkship choices indicated. Indicate periods when you will be preparing for Step 2, interviewing for residencies, conducting research, vacation, etc.

The cover letter and completed Year 3/4 scheduling worksheet should be submitted as a single PDF to the Director and Assistant Director by December 1.

19e. Issues to Consider in Developing a M3/M4 Schedule Request

1. You are developing a schedule that will optimize your competitiveness for a position in a research-intensive residency or PSTP at a top-tier academic institution. You should aim to earn “Honors” in required and elective courses in your clinical specialty/subspecialty of interest. It is also important to establish relationships with faculty who will provide outstanding letters of recommendation.

2. Identify the clinical specialty/subspecialty of interest that you intend to pursue in residency/fellowship. If you are undecided, narrow your choices down to 2. If possible, provide opportunities to explore areas of interest in M3 before residency applications are submitted.

3. The most critical part of your M3/M4 schedule will be the period between your return to clinic in M3 and the submission of your residency application in Year 4 (ERAS submission September 15).

4. Identify an appropriate clinical “lane” for re-entry to medical school and complete the required clerkships in the designated sequence for that lane. If a specific site is critical for a course, you must provide a justification for this site preference when you submit your schedule to the MSTP office that is based on your academic medicine career objective.

5. Electives in your clinical specialty of interest should be completed before residency applications are submitted in Year 4
   a. Good time – July (you will know the system better than new residents)
   b. Bad time – August (faculty who might write letters are often on vacation)

6. If you are planning to do an away rotation:
   a. Apply early!
   b. The best time to do an away rotation is late summer before start of Year 4 (before residency applications will be reviewed)

7. If you are satisfied with your Step 1 score, it is not necessary to take Step 2 before applying for residency. You can take Step 2 in Year 4 (for example, during the period when you are interviewing for residency).

8. If you are NOT satisfied with your Step 1 score:
   a. Complete key required rotations (Med I, Peds, Ob/Gyn, Psychiatry) and as many other required rotations as possible before taking Step 2
b. Take the Step 2 exam no later than the fall of Year 4 (so that your scores will be available when residency applications are being reviewed)


10. Seek advice from:
   a. MSTP/Medical School leadership (Drs. Shimizu, Binstadt, Seaquist, Hertz, Bitterman)
   b. Other physician scientist faculty in your clinical area of interest
      i. Medicine: Peter Bitterman, Erik Peterson, Betsy Seaquist, David Potter
      ii. Pediatrics: Bryce Binstadt, Michael Georgieff
      iii. Other specialties: contact Dr. Shimizu, Dr. Bitterman, Dr. Seaquist, or Dr. Binstadt, who will help you identify appropriate faculty
   c. Senior MSTP students in M4
   d. Recent MSTP graduates

19f. Thesis Update Report

In addition to the M3/M4 Schedule Request, MSTP students who anticipate completing their PhD thesis and returning to clinic during the following academic year will submit a Thesis Update Report. This report should be a clear and concise document with the following information:
   • Student’s name, year entered, thesis advisor, and graduate program
   • Update on status of manuscripts detailing those papers published, in press, submitted, and in progress
   • An outline of research progress that includes experiments left to complete before research is done
   • A timeline of thesis research to be completed.

The Thesis Update Report must be turned into the MSTP office by January 15. Once the request has been submitted, students will be scheduled to meet with the Director, Associate Director, and several members of the MSTP Steering Committee. The meeting will give students an opportunity to update their status and obtain feedback on the feasibility and appropriateness of their plan.

20. EVALUATION OF STUDENT PROGRESS

Students are required to submit an Individual Development Plan (IDP) Progress Report that is due June 1 of each year. Forms are sent to students in mid-April. The IDP Progress Report has two components:

1. Generation of an IDP. An IDP is an ongoing exercise designed to help students develop long-term and short-term career plans. The purpose of the IDP is to help students identify professional career goals and objectives, assess critical skill sets relative to specific professional career goals and objectives, and to develop a plan to acquire skills and competencies necessary to achieve these professional career goals. The IDP should be used to develop SMART (specific, measurable, action-oriented, realistic, and time-bound) goals for specific competency skill areas and implement a development plan that will allow the student to acquire and/or strengthen specific skills essential for reaching career objectives. Additional information to help students in this process is provided in the Appendix. The IDP Progress Report also asks for a summary of activities over the past year and plans for the next year.

2. Submission of an NIH biosketch in the F-award format. M3 students may submit either an NIH biosketch or a curriculum vitae.
The IDP Progress Report is used by the program in several ways. First, the IDP Progress Report documents satisfactory progress in the program and is required for yearly re-appointment in the program. Second, the information provided on student activities is used to meet reporting requirements to the NIH, to update student biographies on the MSTP website, and to document accomplishments in the Program. Third, the IDP Progress Report is used as a foundation for monitoring and advising by program leadership. The Director reviews each report and uses it as a starting point for discussions in one-on-one meetings.

While in the graduate phase, the IDP Progress Report is also provided to the student’s graduate program. The program also receives a yearly written evaluation from the student’s thesis advisor. The advisor’s evaluation assesses:

- Quality of the research
- Work ethic
- Status of first author publications
- Timeline for thesis completion
- Overall strengths and weaknesses

A meeting to discuss the IDP Progress Report and goals for the next year is held each year following submission of the IDP Progress Report. For M1 and M2 students, this is a one-on-one meeting with the Director to discuss progress, identify goals for the next year, determine how the Program can assist in helping the student meet key short-term and long-term career objectives, and to discuss any concerns. A written summary is provided to the student and advisor. For graduate phase students, the student and the advisor meet with a faculty subcommittee consisting of two members of the MSTP Leadership Team, and a member of the MSTP Steering Committee. At this meeting, the student provides a brief overview of the status of thesis research and goals for the next year. The student and the advisor will also meet separately with the subcommittee to discuss any concerns. The student, advisor, and subcommittee will develop a common understanding of specific goals and objectives for the coming year. A written summary will be prepared by the Director and provided to the student and advisor. M3 students meet with the MSTP Leadership Team to discuss post-MD/PhD plans, such as residency applications.

In addition to the IDP Progress Report, each student will have periodic meetings with the Director, Associate Directors, and/or Assistant Director to discuss his/her progress in the Program. These meetings are mandatory and take place during the following times during a student’s tenure in the Program:

- July before the start of Year 1 of Medical School
- Fall of Year 1 of Medical School
- End of Year 1 of Medical School
- January/February of Year 2 of Medical School (Graduate Phase Transition Meeting with Director, Associate Directors, Assistant Director)
- August prior to start of graduate phase
- Yearly during graduate phase (summer)
- 6-9 months before thesis defense (meeting with Director, Associate Directors, Assistant Director)
- End of Year 3 of Medical School (with Director, Associate Director, MSTP Medical School faculty advisor)
- Following conclusion of residency interviews (with Director, Associate Directors, Assistant Director, MSTP Medical School faculty advisor)
- End of Year 4 of Medical School (exit interview)

Students should progress toward the completion of their degrees in a manner consistent with a full-time investment in the Program.

Required elements of satisfactory progress include:
1. Maintaining adequate academic standards in the first two years of Medical School with no failed courses in clinical training and at least a B average (3.0) in Graduate School.

2. Maintaining ethical standards of academic and personal conduct in accordance with the policies and practices of the Medical School, Graduate School and University of Minnesota.

3. Passage of USMLE steps 1 and 2. Step 1 must be completed before beginning clinical rotations and prior to entering the graduate phase. Step 2 must be completed in year four of medical school.

4. Fulfillment of required activities in the Program that include but are not limited to:
   a. Attendance and participation in the Monday M1/M2 Research Meetings by year 1 and 2 students.
   b. Submission of completed IDP Progress Reports by June 1.
   c. Attendance and participation in the annual MSTP retreat.
   d. Presentation of posters annually at the Biomedical Sciences Graduate Programs Research Recognition Day.
   e. Attendance and participation in the monthly student meetings.
   f. Attendance and participation in the MSTP Student-Invited Physician Scientist Scholar Lecture Series
   g. A minimum of one MSTP Grand Rounds presentation during the graduate phase.
   h. Completion of the MSTP Clinical Continuity and Mentoring Program prior to returning to clinic.
   i. Fulfillment of the Clinical/Basic Science Seminar requirement prior to returning to clinic.

5. Demonstration of full-time effort and progress toward completion of the PhD dissertation. This includes:
   a. Selection of a thesis mentor and graduate program by January 1 of year 2 of Medical School.
   b. Completion of the thesis in a timely manner. This will vary with the area of research focus and the graduate program affiliation. As a guideline, three to four years is generally sufficient. However, quality of science rules the day and students should not compromise this goal by attempting to prematurely return to clinical training.
   c. Students must have at least one first-authored refereed manuscript published or in press prior to returning to clinic.

21. REMEDIES FOR UNSATISFACTORY STUDENT PROGRESS

A trainee may be dismissed from the Medical Scientist Training Program for failure to make satisfactory progress as defined by the Policy and Procedures of the Committee on Student Scholastic Standing in the Medical School, and policies inherent to the individual graduate program in which the trainee is pursuing their PhD. The dismissal of a MSTP trainee can also occur because of failure to successfully traverse major checkpoints in Years 1 and 2 of Medical School, the graduate training phase, or Years 3 and 4 of Medical School. Major checkpoints are: 1) successfully passing all courses and completing USMLE part 1, 2) completion of the graduate phase of training within 4 years, and 3) successful completion of all clinical requirements and graduation from Medical School no more than two years after completing the PhD.

Any student making inadequate progress or having non-academic problems will be requested to meet with the Director. Upon clarification of the circumstance or identifying potential deficiencies or problems, the Director may either: 1) conclude that no further action is warranted, or 2) discuss the student’s circumstance with the Associate Directors. Following discussion with the Associate Directors, the Director will send a letter to the student restating the problem, what must be accomplished by the student to resolve the
problem, and a time frame in which the problem must be resolved. A student who receives such a letter will be placed on probation. One week prior to the deadline for resolving the problem, the student will submit in writing to the Director precisely what has been done to resolve the problem. The Director will share this information with the Associate Directors, a recommendation will be made, and the outcome communicated to the student in writing. If the student is dismissed from the Program, all financial support from the Program will cease coincident with the date of the dismissal letter. The final authority to remove the probationary status or dismiss the student is at the discretion of the Director.

22. LEAVES OF ABSENCE

Circumstances may arise that require a student to take a leave of absence. This must be approved by the Director and arranged with the MSTP office and the graduate program or Medical School, as appropriate. A leave of absence will not be honored if the student does not notify the Program administration and receive approval. Students should submit a formal written request for a leave with the MSTP office. Whether or not the student continues to receive financial support during the leave of absence will be dictated by the circumstances, under the authority of the Director.

23. SUPPORT FOR TRAVEL TO SCIENTIFIC MEETING

Since scientific meetings are an important component in the education of physician scientists, travel to scientific meetings is encouraged. Funds are available from the MSTP for students to travel to a national or international scientific meeting of their choice. A budget limit of $1,000 per student, which can be used at any time during a student’s tenure in the Program, has been adopted. To exercise this option, students should submit a written request to the Assistant Director, well in advance of the chosen meeting. The request should include the following:

- Name of the meeting
- Where and when the meeting will occur
- Relevance of the meeting to the thesis project
- An itemized proposed budget
- An endorsement from the student’s thesis advisor.

The MSTP will only consider providing support if the student is exhibiting at a poster session or giving an oral presentation.

Additionally, the MSTP encourages students to travel to the yearly National MD/PhD Student Conference, the American Physician Scientists Association Annual Meeting, and the National Conference for Physician-Scholars in the Social Sciences and Humanities. The MSTP will provide funds for several students per year to travel to these conferences. Notices are sent to students each winter/spring and interested students are asked to submit their names for consideration. Priority is given to those students with seniority in the Program and to those doing research in an area most closely related to the topic of the conference.

Additional information on travel requirements and reimbursement of travel expenses is in the Appendix.

24. PROGRAM MEETINGS AND STUDENT-INITIATED ACTIVITIES

24a. Monday M1 and M2 Research Meetings
The MSTP M1 and M2 Research Meetings (Mondays at 12:15 PM) aim to promote the intellectual involvement of first and second year MSTP students in research, and to develop key research and
professional development skills that will promote a successful transition to the graduate phase and overall career development as a physician scientist. The meetings are a combination of research and professional skills development activities, discussion of past research accomplishments, opportunities for future thesis projects and career development by MSTP faculty preceptors, and student-led discussion of research articles from the scientific literature in a journal club format. All first and second year MSTP students are required to attend.

24b. Annual MSTP Retreat
The retreat occurs each summer (usually in July) and is organized by the student MSTP Retreat Committee with logistical support from the MSTP Office. The retreat showcases the research being conducted by MSTP students, and also features presentations by guest speakers and workshops on a variety of topics relevant to MSTP training and career development. The retreat provides an important venue for students in various phases of the Program to meet, socialize and discuss topics of concern. The retreat is an important element of the Program and attendance is mandatory. Students in clinical rotations must work with the MSTP office to secure the necessary leave.

24c. Monthly student program meetings
Student-organized program meetings are held on the second Monday of each month in the evening. Meetings will cover a range of topics, including science/research presentations by students and faculty guest speakers, career development discussions and panels, networking opportunities with other physician scientists, and social activities. These meetings will also provide students with updates on the Program and the Medical School, and an opportunity to provide feedback to the Director and MSTP Student Advisory Committee on program activities. The monthly program meetings are an essential element of the MSTP and attendance by all MSTP students is mandatory.

24d. MSTP Grand Rounds
MSTP Grand Rounds is a monthly case-based small group style discussion of a clinical problem and relevant state-of-the-art science. MSTP students will collaborate with their Clinical Continuity mentor to select and present a case that highlights the particular clinical problem and develop a “Morbidity and Mortality” style presentation of the case. Following the case presentation, the student and Clinical Continuity mentor will lead the group in an interactive grand rounds style presentation of the current science aimed at understanding the highlighted clinical problem. MSTP students in the second year of the graduate phase are required to give one MSTP Grand Rounds presentation as part of the “Clinical Continuity for Physician Scientists 1” course. MSTP students in other phases of training may volunteer to present a case presentation. See Section 17 for additional information.

24e. Women in Science and Medicine
The mission of the MSTP Women in Science and Medicine Group is to inspire, encourage, and enable the women physician scientists in the Medical Scientist Training Program (MD/PhD) to achieve their personal and professional goals in becoming academic physician scientists through open discussion of potential career obstacles and interaction with successful female role models. The MSTP Women in Science and Medicine Group hosts regular social dinners for women MSTP students and University of Minnesota faculty to engage in discussions focused on career development, mentoring, and leadership. These meetings foster relationships between students and female role models in the scientific and medical communities.

In addition, the MSTP, in collaboration with the Office of Faculty Affairs and the Office of Medical Education, co-sponsors Women in Science and Medicine research seminar presentations by invited external women physician scientists. Opportunities are provided for MSTP students to meet with these invited speakers.

The Women in Biology website provides an online resource for women biologists, including aspects of science education, an extensive list of career resources, and information about the specific challenges women face in science.
24f. Biomedical Sciences Graduate Programs Research Recognition Day
Research Recognition Day is held annually in May and consists of student poster sessions, talks by recipients of the Beatrice Z. Milne and Theodore Brandenburg Award, and a guest keynote address. MSTP students in the graduate phase are required to submit an abstract and participate in the poster session. It will be the responsibility of the student and his/her faculty advisor to prepare the posters; display materials will be provided by the Research Recognition Day organizers.

24g. Student Invited Physician Scientist Scholar Lecture Series
The objective of the MSTP Student Invited Physician Scientist Scholar Lecture Series is to invite an exceptional investigator to give a formal research presentation to the medical school community and to meet informally with all students. It also provides a means to help showcase the role of the physician scientist in clinical medicine, basic research, and in health care delivery. The Program is committed to supporting one speaker per year. While the Student Advisory Committee is responsible for implementing the lecture series, all students in the Program provide input. In addition, the Committee is committed to cooperating with other groups in order to provide programs of mutual interest. These groups include all clinical and basic science departments.

25. ACKNOWLEDGMENT OF MSTP FELLOWSHIP SUPPORT IN PUBLICATIONS
All students who have been supported by the MSTP T32 training grant at some time during their studies should acknowledge the support in all publications (except abstracts) as follows: “Jane Doe was supported by NIH MSTP grant T32 GM008244” or “This work was supported by (list of other support) and by NIH MSTP grant T32 GM008244 (J.D.).

It does not matter whether the student is supported by the MSTP grant at the time the work is done or the manuscript is submitted. The important point is that the MSTP grant made it possible for the student to be here and do the work: “once an MSTP [student], always an MSTP!” Students who are/have been supported by any other fellowship should acknowledge the support using the format for acknowledging MSTP support.

26. FELLOWSHIPS AND AWARDS
The Program expects MSTP students to apply for internal and external predoctoral fellowships, particularly NIH F30/F31 awards.

26a. NIH F30 and F31 Predoctoral Fellowship
Information on NIH F30/F31 awards is available online at [https://researchtraining.nih.gov/programs/fellowships](https://researchtraining.nih.gov/programs/fellowships). Students should plan to submit applications just prior to or during the first year of graduate training, but no later than the end of the second academic year of the graduate phase (April 8 deadline). Application deadlines are August 8, December 8 and April 8. Please contact the Director well in advance of the deadline for the required “Additional Educational Information” and Clinical Training Plan information.

Multiple resources are available to assist students in preparing a competitive F30/F31 application:
- Grant writing workshops are held by graduate programs. If a student’s graduate program does not offer a grant writing course, students may opt to take the graduate course “Professional Skills Development for Biomedical Scientists” (PHSL 8242) offered by the Integrative Biology & Physiology Graduate Program.
• The MSTP holds a yearly NIH F30/F31 workshop. Students in the first year of the graduate phase are required to attend.

• The book, “A Practical Guide to Writing a Ruth L. Kirschstein NRSA Grant” by Andrew Hollenbach can be accessed online through the University of Minnesota Biomedical Library at http://z.umn.edu/f30guide

• A series of online videos “So You Want to Apply for an NRSA” is available from the University of Southern California CTSI at http://z.umn.edu/nrsavideo

• Copies of F30/F31 applications prepared by MSTP students, and information on the NIH review criteria, are available from the Director. Students will receive a link to this information before entering the graduate phase.

26b. American Heart Association Clinical Health Profession Student Training Program

The American Heart Association offers predoctoral fellowships specifically for MD/PhD students through the Clinical Health Profession Student Training Program. Unlike NIH fellowships, the AHA fellowships are NOT restricted to US citizens and permanent resident. There are two funding cycles per year. Additional information is available at http://professional.heart.org/professional/ResearchPrograms/ApplicationInformation/UCM_489785_Clinical-Health-Profession-Student-Training-Program.jsp

26c. Rheumatology Future Physician Scientist Award

The Rheumatology Research Foundation supports MD/PhD students who demonstrate outstanding potential and significant commitment to a career in rheumatology research. To encourage timely completion of dual degree training, this award is generally not intended to support students after year 5 of their training program. Ideally, support will be for 2 years during years 3-6 of the dual degree program (after the initial 2 years of classwork but prior to the clinical rotations/medical training). The primary mentor must be a member of the American College of Rheumatology at the time of application and for the duration of the award. Additional information is available at https://www.rheumresearch.org/file/awards/2017/FPS-FY19_RFA.pdf

26d. Paul and Daisy Soros Fellowships for New Americans

The Paul and Daisy Soros Fellowships for New Americans supports the graduate education of New Americans (permanent residents or naturalized citizens if born abroad; otherwise children of naturalized citizen parents). Each fellowship supports up to two years of graduate study – in any field and in any advanced degree-granting program – in the United States. Additional information is available at http://www.pdsoros.org/.

26e. Robert W. Johnson Foundation Health Policy Research Scholars

Health Policy Research Scholars is a leadership development opportunity for first- and second-year full-time doctoral students from underrepresented populations and/or disadvantaged backgrounds. Applicants must be pursuing a research-focused discipline that can advance a culture of health, and interested in health policy and interdisciplinary approaches.

26f. Autism Speaks Weatherstone Predoctoral Fellowship

Autism Speaks established the Dennis Weatherstone Predoctoral Fellowship Program in 2008 with a generous grant from the Stavros Niarchos Foundation. Its goal is to transform the future of autism research by launching the careers of highly promising graduate students. Following a highly competitive application
and review process, each year’s new class of fellows pursues a two-year research project under the mentorship of leading investigators in the field of autism research.

26g. Graduate School Bridging Funds

The Graduate School has a Bridging Fund program that covers tuition, health insurance and fees that exceed the amount provided by externally funded predoctoral fellowships. MSTP students who are awarded an externally funded fellowship are encouraged to apply for these bridging funds once a fellowship award notice is received. Additional information is available on the Graduate School website at https://www.grad.umn.edu/funding-tuition/bridgingfunds.

26h. Warwick Fellowship

The Warwick Fellowship was established in 2006 by a generous gift from Warren and Henrietta Warwick. The award provides a stipend of $27,000, Graduate School tuition, health insurance, plus a research grant of $3,000. The Program nominates one MSTP student each year. Nominees are selected via an internal competition announced to the MSTP community in the spring.

26i. Doctoral Dissertation Fellowship

The Doctoral Dissertation Fellowship (DDF) program gives the University's most accomplished Ph.D. candidates an opportunity to devote full-time effort to dissertation research and writing during the fellowship year. Students should consult with their graduate program to obtain details on the nomination process. Students must have completed program coursework, and passed the written and oral preliminary examinations.

26j. Endowed Fellowships Administered by the Graduate School

Several privately endowed fellowships are administered by the Graduate School and available to currently enrolled graduate students.

26k. University of Minnesota Foundation Awards

The University of Minnesota recognizes academic excellence and achievement with yearly honors and awards made possible by the University of Minnesota Foundation and its donors. These honors and awards include the Beatrice Z. Milne and Theodore Brandenburg Award, which recognizes exceptional thesis research by graduate students in the basic biomedical sciences. A complete list of awards is available at the University of Minnesota Foundation website. MSTP students are encouraged to apply for any and all eligible awards.

26l. CTSI Translational Research Development Program

The Clinical and Translational Science Institute Translational Research Development Program provides institutional research funds for postdoctoral and predoctoral trainees with a demonstrable and significant interest in clinical or translational research focused on human health. The program aims to provide an opportunity for early stage investigators to gain significant experience with clinical and translational research as a foundation for the development of an independent research career focused on human health. Funds are designed to support a modest research project that will result in a publication in a peer reviewed journal.

All MSTP students are eligible to apply for a CTSI Translational Research Development Program grant. Additional information is available at the CTSI website.
26m. Council of Graduate Students Grants
The Council of Graduate Students offers two types of individual grants:

Career Development Grants pay costs associated with the development of graduate student careers. Possible eligible expenses might include travel and fees associated with professional development workshops, learning new techniques essential for your career (e.g. polymerase chain reaction method, “programming for biologists” short course), and travel to internships.

Travel Grants provide support for travel to present original work at a conference with a poster, oral presentation, or other acceptable format.

Additional information is available at the COGS website.

27. MISCELLANEOUS POLICIES AND PRACTICES

27a. Vacation policy.
Program students are entitled to two weeks (10 business days) of vacation per year. Any additional vacation time awarded by the Medical School or graduate degree program should be viewed as an opportunity to devote more concerted time to lab rotations or thesis research.

27b. Reimbursement policy for meals.
Dinner and beverage charges for spouses/significant others are not allowed by the University of Minnesota. Spouses/significant others can attend program events but must pay for their own meals and beverages.

Reimbursement for alcohol is permitted at dinner only if cleared by the Assistant Director and is limited to one drink per attendee. If alcohol is purchased, it must be listed on a separate receipt. Alcohol reimbursement is not permitted for lunch events.

Per University of Minnesota policy, tipping is allowed up to 20% of the pre-tax total of the meal. Tips paid beyond the 20% pre-tax limit are non-reimbursable, regardless of the quality of service or experience.

27c. Free time during clinical years.
Free time during clinical years should be used for interviewing, residency application, studying for Step 2, research or other elective rotations. The Program expects that students will continue to be productive in research. See Section 18a Financial Support During the Clinical Training Phase for additional information on policies governing Program financial support during clinical training.

27d. Thesis copies.
The Program requires a bound copy of your finalized thesis for the MSTP office. The Program maintains a library of completed MSTP student theses in the Program office for applicants who are curious about the work of past students. The Program will reimburse you for the cost of one bound thesis if a receipt is submitted in a timely manner.

27e. Medical School graduation.
Attendance of graduating MSTP trainees at the Medical School commencement ceremony is mandatory. Special recognition is given to MSTP graduates during the ceremony.
28. HEALTH AND WELL-BEING
The Program is committed to the health and well-being of each and every student in the program. Students are encouraged to develop a strong support network and to seek assistance if necessary. Program leadership is available at any time for confidential discussions on matters of health and well-being. The University of Minnesota offers numerous services and resources for students that can be accessed at the Student Mental Health website.

28a. Crisis / Urgent Consultation
No appointment is needed to speak with a counselor for an urgent need.

If you are in a life-threatening emergency, call 911.

28b. Medical Student Well-Being
A wealth of information and tools for medical students regarding the 6 facets of well-being (Health, Relationships, Community, Environment, Security, Purpose). Additionally, the Committee offers wellness events throughout the academic year and an e-mail weekly wellbeing reflection survey to current medical students.

28c. Boynton Mental Health Clinic
Students must come to the mental health clinic in person to make their first appointment. When they arrive, students will complete paperwork and an online survey before they meet with a clinician for a 15 to 20 minute consultation. Therapists will talk with students to better understand individual situations and then schedule follow-up appointments with the most appropriate service based on student needs. First consultations take place at the Boynton Mental Health East Bank Clinic:
- Monday, Tuesday, Wednesday, Friday 8:30 a.m. – 3:30 p.m.
- Thursdays 9:00 a.m. – 3:30 p.m.
(students might experience some wait time—especially during lunch and late afternoons.)

28d. Student Counseling Services
Student Counseling Services promotes student success through 1) Individual and group counseling; 2) Classes, workshops, and presentations; and 3) Consultation to faculty, staff, and students. Student Counseling Services (SCS) offers same day initial counseling and walk in appointments.

28e. Disability Resource Center
The Disability Resource Center works with students with all types of disability conditions (e.g. psychiatric and mental, physical, vision, hearing, systemic, or learning disabilities), to ensure equal learning and working opportunities at the University of Minnesota. If you have concerns that your health could interfere with your academic performance, you can contact them via email or phone, or you can go to the office during drop-in hours. You will meet with an access consultant who will help you develop reasonable accommodations if they are relevant to you. These will be written up in an accommodations letter that you can give to instructors, who will then work with you to meet your needs.

28f. Aurora Center
The Aurora Center provides a safe and confidential space for students, faculty, staff, alumni, and family members or friends affiliated with the University of Minnesota or Augsburg College who are victims/survivors/concerned people of sexual assault, relationship violence, or stalking.

28g. Behavioral Consultation Team

The University of Minnesota’s Behavioral Consultation Team (BCT) is a team of staff from several departments across the University with administrative, psychological, academic and legal expertise. The team operates within FERPA/HIPAA requirements. Its goal is to provide a coordinated response to situations arising from students who may represent a threat of harm to themselves or others.

28h. de-stress

de-stress is a student-led health promotion group helping students manage stress and connect with mental health resources on campus.

28i. Online therapy

Online therapy is a University of Minnesota mental health resource that may help students manage symptoms of anxiety, depression and stress.

28j. Confidential Peer Assistance Program (CPAP)

The Confidential Peer Assistance Program (CPAP) is an organization of University of Minnesota medical students who provide confidential, non-judgmental support to fellow students looking for assistance in coping with school and non-school related questions and stressors. If you would like support, you can contact a student directly, attend weekly “Drop-In” hours, or send a question to the general CPAP contact email (cpap@umn.edu).

28k. Learner Development – University of Minnesota Medical Education

A full range of academic services assists students in developing optimal learning and performance skills and strategies, such as time management, organizational skills, problem-solving, memorization and reading techniques, test-taking skills, etc.

28l. Student Academic Success Services (SASS)

SASS is a University of Minnesota service that promotes academic success via online resources, workshops, and in-person services. Topics in their “5 Core Factors” include “Self Awareness” and “Life Balance.”

28m. Classes and other activities

- Tai Chi and Yoga
- Stress Busters with Center for Spirituality and Healing
- Nutritional Health Consultations
- Massage Therapy
- PAWS: Pet Away Worry & Stress
- Financial Wellness
28n. University Recreation and Wellness

Exercise can be an extremely important factor in maintaining mental health. General workout areas and pools at the Rec Center are free to all students who pay the Student Services Fee. Some activities, such as the indoor rock climbing wall or equipment rental, cost extra, but everything is very reasonably priced. Details about special features such as classes, lessons, and outdoor equipment rental can be found on the University Recreation and Wellness website.
### 29. TIMELINE FOR MSTP TRAINING

The overall “timeline” (including critical dates) of the training program is summarized below (for a 7-8 year program of study).

<table>
<thead>
<tr>
<th>Date</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Summer before Year 1</td>
<td>- <strong>Lab rotation</strong>&lt;br&gt;- <strong>Monday M1 and M2 Research Meetings</strong>&lt;br&gt;- <strong>Responsible Conduct in Research training</strong>&lt;br&gt;- Meet with Director (July)</td>
</tr>
<tr>
<td>Year 1</td>
<td>- First year Medical School curriculum&lt;br&gt;- <strong>Monday M1 and M2 Research Meetings</strong>&lt;br&gt;- Meet with Director (fall)&lt;br&gt;- <strong>Lab rotation</strong> (spring semester)&lt;br&gt;- Submit <a href="#">annual IDP Progress Report</a> (June 1)&lt;br&gt;- Meet with Director (June/July)</td>
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<tr>
<td>Summer of Year 1</td>
<td>- <strong>Lab rotation</strong>&lt;br&gt;- <strong>Responsible Conduct in Research training</strong></td>
</tr>
<tr>
<td>Year 2</td>
<td>- Second year Medical School curriculum&lt;br&gt;- <strong>Monday M1 and M2 Research Meetings</strong>&lt;br&gt;- Complete laboratory rotations&lt;br&gt;- Choose thesis advisor/Graduate Program and submit <a href="#">MSTP Student Research Commitment Statement</a> (January 1)&lt;br&gt;- <strong>Graduate Phase Transition Meeting</strong>&lt;br&gt;- Submit annual progress report (June 1)</td>
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<tr>
<td>May-June of Year 2</td>
<td>- <strong>USMLE Step 1 Examination</strong></td>
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<tr>
<td>June-August of Year 2</td>
<td>- <strong>Complete clinical rotation(s)</strong>&lt;br&gt;- Meet with Director (August)</td>
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<tr>
<td>Graduate Phase Years 3-5/6</td>
<td>- Complete required graduate courses&lt;br&gt;- Initiate full-time thesis research&lt;br&gt;- <a href="#">Seek independent funding by submitting a NIH F-series predoctoral fellowship application</a> (or equivalent)&lt;br&gt;- <a href="#">Present research at Biomedical Sciences Graduate Programs Research Recognition Day</a> (annually)&lt;br&gt;- Submit annual progress report (June 1)&lt;br&gt;- Meet with annual progress review committee (annually)&lt;br&gt;- <strong>Present chalk talk at MSTP Annual Retreat</strong> (end of graduate phase year 1)&lt;br&gt;- Complete and pass preliminary written and oral examinations&lt;br&gt;- Select thesis committee&lt;br&gt;- Meet with thesis committee (every 6-12 months)&lt;br&gt;- <a href="#">Enroll and complete Clinical Continuity Experience for Physician Scientists 1</a> (year 2 of graduate phase)</td>
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</table>
- Present a minimum of one MSTP Grand Rounds (in year 2 of graduate phase)
- Enroll and complete Clinical Continuity Experience for Physician Scientists 2 (year 3 of graduate phase)
- Enroll and complete Clinical Foundations for the Physician Scientist (end of graduate phase)
- Present research at a minimum of two national/international conferences
- Present research seminar at MSTP student monthly meeting (middle of grad phase year 3)
- Submit M3/M4 Schedule Request (by November 1 of last year of graduate phase)
- Submit Thesis Update Report (by January 31 of last year of graduate phase)
- Present Clinical/Basic Science Seminar (last year of graduate phase)
- Publish at least one first-authored paper in a peer-reviewed journal prior to return to clinic
- Write, defend and submit thesis no later than the end of the fourth year in graduate phase

| Year 6/7 | Resume clinical rotations  
| Submit annual progress report (June 1)  
| Meet with Director, MSTP Faculty Advisor, and Associate Directors (June - August) for residency application preparation  
| Prepare residency application |

| Year 7/8 | Apply to residency training programs  
| Complete clinical rotations  
| USMLE Step 2 Examinations  
| Meet with Director and Associate Directors after completion of residency interviews and before submission of residency rank list (January/February)  
| Residency Match results (March)  
| Complete Program with both MD and PhD degrees  
| Attend Medical School graduation  
<p>| Meet with Director (exit interview) |</p>
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30. POLICIES AND PROCEDURES OF THE COMMITTEE ON STUDENT SCHOLASTIC STANDING

https://www.med.umn.edu/md-students/policies-governance/academic-progression/scholastic-standing-committees/cosss-twin-cities
Appendix

MSTP Executive Committee
June 2017

Yoji Shimizu, PhD  
MSTP Director

Bryce Binstadt, MD, PhD  
MSTP Associate Director

Peter Bitterman, MD  
MSTP Associate Director

Elizabeth Seaquist, MD  
MSTP Associate Director

Susan Shurson, MA  
MSTP Assistant Director

Marshall Hertz, MD  
Medical School Faculty Advisor for MSTP Students

Lauren Harasymiw  
Student Representative
MSTP Steering Committee
2017 - 2018
mdphd-committee@lists.umn.edu

Yoji Shimizu, PhD
Bryce Binstadt, MD, PhD
Elizabeth Seaquist, MD

Laboratory Medicine and Pathology
Pediatrics
Medicine

Anthony Baugh, PhD (2018)
James Ervasti, PhD (2018)
Melissa Gardner, PhD (2018)
Linda McLoon, PhD (2018)
Angela Panoskaltsis-Mortari, PhD (2018)
Courtney Aldrich, PhD (2019)
Kaylee Schwertfeger, PhD (2019)
Jop van Berlo, MD, PhD (2019)
Greg Metzger, PhD (2019)
Masato Yamamoto, MD, PhD (2019)
Michael Georgieff, MD (2020)
David Potter, MD, PhD (2020)
Peter Bitterman, MD (2020)
Casim Sarkar, PhD (2020)
Pamela Lutsey, PhD (2020)
Esther Krook-Magnuson, PhD (2021)
Erik Peterson, MD (2021)
Chad Myers, PhD (2021)
Rita Perlingeiro, PhD (2021)
Stan Thayer, PhD (2021)

Tucker LeBien, PhD**
Dimple Patel**
Susan Shurson**

**ex officio

Laboratory Medicine and Pathology
Associate Dean for Admissions
MSTP Assistant Director
MSTP Student Advisory Committee
2017 - 2018
mstp-student-advisory@lists.umn.edu

Google Drive folder

Tracy Marko 2016-2018 2010 entering class
Mat Angelos 2016-2018 2011 entering class
Amritha Yellamilli 2017-2019 2011 entering class
Melvin Donaldson 2016-2018 2012 entering class
Brian Sweis 2017-2019 2012 entering class
Amanda Barks 2016-2018 2013 entering class
Rebecca Speltz 2017-2019 2013 entering class
Sruthi Valluri* 2016-2018 2014 entering class
Rebecca Goldblum 2017-2019 2014 entering class
Stephanie Rhee** 2017-2019 2015 entering class
Terri McBride 2016-2018 2015 entering class
Caleb Vogt 2017-2019 2016 entering class
Kelsey Wanhainen 2016-2018 2016 entering class
Jenna Johnson 2017-2019 2017 entering class
Fathima Mohamed 2017-2019 2017 entering class

*SAC Chair
**SAC Co-Chair

Executive Committee Student Representative
Lauren Harasymiw

University of Minnesota MSTP APSA Representative
Lee Meier

COGS Representative
Mayank Verma

Research Recognition Day Committee Representative
Amanda Barks

Monthly Meeting Subcommittee
Dieter Brandner
Bayardo Garay
Noah Gavil
Blake Stagg

Retreat Subcommittee
Mnna Ding
Kevin Lin
Roberto Lopez Cervera
Julie Riedl
Social Events Subcommittee
Erik Faber
Rebecca Goldblum
Roberto Lopez Cervera
Sathi Wijeyesinghe

Volunteer Event Subcommittee:
Sara Bolivar Wagers
Natalie David
Megan Schmit
Caleb Vogt
Kelsey Wanhainen

Diversity and Inclusion Working Group
Ifeolu Akinnola
Terri McBride
Carlos Santos Perez
Megan Schmit
Blake Stagg
Brian Trieu
Sruthi Valluri
German Velez Reyes
Stephanie Rhee
Matt Wheelwright
Sathi Wijeyesinghe
Roberto Lopez Cervera
MSTP Student Admissions Committee
2017 - 2018

Amanda Barks
Elise Breed
Melvin Donaldson
Erik Faber
Lauren Jelenchick Harasymiw (Chair)
Lee Meier
Lien Phung
Stephanie Rhee
Brian Trieu
### Directors of Graduate Studies (DGS)

<table>
<thead>
<tr>
<th>Graduate Program</th>
<th>DGS</th>
<th>Telephone</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemistry, Molecular Biology &amp; Biophysics (BMBB)</td>
<td>Laurie Parker, PhD</td>
<td>624-9066</td>
<td><a href="mailto:lparker@umn.edu">lparker@umn.edu</a></td>
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<tr>
<td>Biomedical Engineering (BME)</td>
<td>Victor Barocas, PhD</td>
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</tr>
<tr>
<td>Biomedical Informatics &amp; Computational Biology (BICB)</td>
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<td><a href="mailto:neuha001@umn.edu">neuha001@umn.edu</a></td>
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<tr>
<td>Chemical Engineering (ChemE)</td>
<td>Aditya Bhan, PhD</td>
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<tr>
<td>Chemistry</td>
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<tr>
<td>Epidemiology</td>
<td>Michael Oakes, PhD</td>
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<tr>
<td>Integrative Biology &amp; Physiology (IBP)</td>
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<td><a href="mailto:kotzx004@umn.edu">kotzx004@umn.edu</a></td>
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<tr>
<td>Medicinal Chemistry</td>
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<tr>
<td>Microbiology, Immunology &amp; Cancer Biology (MICaB)</td>
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</tr>
<tr>
<td>Molecular, Cellular, Developmental Biology &amp; Genetics (MCDB&amp;G)</td>
<td>Duncan Clarke, PhD</td>
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<tr>
<td>Neuroscience</td>
<td>David Redish, PhD</td>
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<tr>
<td>Pharmacology</td>
<td>Jill Siegfried, PhD</td>
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<tr>
<td></td>
<td>Jonathan Marchant, PhD</td>
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</tr>
</tbody>
</table>
Health and Well-Being
Essential Numbers

Boynton Mental Health Clinic
(612) 624-1444

Student Counseling Services
(612) 624-3323

Disability Resource Center
(612) 626-1333

International Student and Scholar Services (ISSS)
(612) 626-7100

Aurora Center
(612) 626-9111

Behavioral Consultation Team
(612) 626-3030
Multicultural Resources and Services

Directory of Twin Cities Multicultural Resources and Services (Office for Diversity in Graduate Education)
## Research Rotation Information

The table below lists research rotations performed by current and recently graduated students in the MSTP. This is provided as a resource for incoming MSTP students seeking information about potential rotations and research opportunities in the program. An * indicates that the student has completed or is completing their PhD under the mentorship of the indicated faculty member.

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Student</th>
<th>Student E-mail</th>
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<tbody>
<tr>
<td>Amin, Elizabeth</td>
<td>Erik Faber</td>
<td><a href="mailto:fabe053@umn.edu">fabe053@umn.edu</a></td>
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<tr>
<td>Araque, Alfonso</td>
<td>Michelle Corkrum*</td>
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<td></td>
<td>Brian Trieu</td>
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<tr>
<td>Asakura, Atsushi</td>
<td>Mayank Verma*</td>
<td><a href="mailto:verma014@umn.edu">verma014@umn.edu</a></td>
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<td>Ashe, James</td>
<td>Rachael Blackman</td>
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<tr>
<td>Ashe, Karen</td>
<td>Balvindar Singh</td>
<td><a href="mailto:singh308@umn.edu">singh308@umn.edu</a></td>
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<td></td>
<td>Ryan Nelson</td>
<td><a href="mailto:nels5471@umn.edu">nels5471@umn.edu</a></td>
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<td>Barocas, Victor</td>
<td>Caleb Vogt</td>
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<tr>
<td>Bartolomucci, Alessandro</td>
<td>Brian Sweis</td>
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<td>Michelle Corkrum</td>
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<td>Bernlohr, David</td>
<td>Michael Downey*</td>
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<td>Bielinsky, Anja</td>
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<td>Megan Schmit*</td>
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<td></td>
<td>Kevin Lin</td>
<td><a href="mailto:linx1048@umn.edu">linx1048@umn.edu</a></td>
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<td>Binstadt, Bryce</td>
<td>Lee Meier*</td>
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<td>Elise Breed</td>
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<td>Nathan Welty</td>
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<td>Ebner, Tim</td>
<td>Sam Cramer*</td>
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<td></td>
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<td><a href="mailto:schm4097@umn.edu">schm4097@umn.edu</a></td>
</tr>
<tr>
<td>Wagner, R. Carston</td>
<td>Cliff Csizmar*</td>
<td><a href="mailto:csizm004@umn.edu">csizm004@umn.edu</a></td>
</tr>
<tr>
<td>Wood, David</td>
<td>Stephanie Rhee</td>
<td><a href="mailto:rheex016@umn.edu">rheex016@umn.edu</a></td>
</tr>
<tr>
<td>Vallera, Dan</td>
<td>Cliff Csizmar</td>
<td><a href="mailto:csizm004@umn.edu">csizm004@umn.edu</a></td>
</tr>
<tr>
<td>Faculty Member</td>
<td>Student</td>
<td>Student E-mail</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>van Berlo, Jop</td>
<td>Amritha Yellamilli*</td>
<td><a href="mailto:yella007@umn.edu">yella007@umn.edu</a></td>
</tr>
<tr>
<td></td>
<td>Javier Sierra-Pagan</td>
<td><a href="mailto:sierr025@umn.edu">sierr025@umn.edu</a></td>
</tr>
<tr>
<td>Vitek, Jerrold</td>
<td>Scott Warren</td>
<td><a href="mailto:warre295@umn.edu">warre295@umn.edu</a></td>
</tr>
<tr>
<td>Wickman, Kevin</td>
<td>Judit Perez Ortiz</td>
<td><a href="mailto:perez211@umn.edu">perez211@umn.edu</a></td>
</tr>
</tbody>
</table>

**Other Resources for Lab Rotations and Advisor Selection:**

**NIH Reporter:** Searchable database for NIH funding

**PubMed**
University of Minnesota
Medical Scientist Training Program (MD/PhD)

Laboratory Rotation Evaluation Form

Submitted By:  

Faculty Member:  

Dates of Rotation:  

Please rate how much you felt you learned from this rotation on a scale of 1-5 (1=most)  

Please rate the intensity of time commitments on a scale of 1-5 (1=most intensive):  

Please rate the overall experience on a scale of 1-5 (1=best):  

Are you interested in conducting your PhD research with this mentor?  Maybe

Describe what you accomplished during your rotation, and your experiences with this research mentor. Specifically comment on the ratings/recommendations above.
MedicaL Scientist Training Program (MD/PhD)

Faculty Rotation Evaluation

Student Name:  
Faculty Member:  
Dates of Rotation:  

Thank you for providing a laboratory rotation experience for this MSTP student. Your evaluation of the student’s performance will be used by the MSTP in student advising and mentoring, and to provide guidance in selection of a laboratory for PhD training. Your evaluation will be made available to the student if requested.

Please evaluate the student in each of the following areas:

- Research ability and potential: Met expectations
- Self-reliance and independence: Met expectations
- Motivation: Met expectations
- Creativity: Met expectations
- Work ethic: Met expectations
- Communication skills: Met expectations

Did the student put sufficient effort into becoming familiar with your research area?  

Would you be interested in having this student join your lab as a PhD student?  

Please evaluate the student’s lab rotation performance. Discuss the student’s strengths and weaknesses and explain why you may or may not be interested in having the student join your lab.

UMN x500 ID:  
Date:  

Please return the completed form to Yoji Shimizu by E-mail – shimi002@umn.edu
Graduate Program Requirements for MSTP Students

Course, exam and teaching requirements for specific graduate programs are provided on the following pages. Students should always consult the graduate program leadership to confirm these requirements for MSTP students.

All PhD students at the University of Minnesota must complete a minimum of 48 credits: a minimum of 24 graduate-level course credits AND a minimum of 24 thesis credits.

Biochemistry, Molecular Biology and Biophysics (BMBB) Graduate Program

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Supporting Courses</th>
<th>Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>• MCDG 8920 – Special Topics / Itasca Workshop (2 credits)</td>
<td>• Maximum of 18 credits in order to meet the 24 credit minimum required by the Graduate School</td>
<td>One semester</td>
</tr>
<tr>
<td>• Minimum of 4 credits of coursework in a single area of emphasis: Regulatory Biochemistry, Molecular Biology, Microbial Biochemistry and Biotechnology, or Structural Biochemistry and Biophysics</td>
<td>Medical School coursework is used to fulfill supporting course requirement</td>
<td></td>
</tr>
</tbody>
</table>

Coursework should be planned in consultation with the PhD advisor and BMBB DGS upon entering the program.

Written preliminary exam: Beginning of spring semester year 1
Oral preliminary exam: End of spring semester year 1

Consult the BMBB Handbook for additional information.
### Biomedical Engineering Graduate Program

| Required Courses | • BMEn 8000-level core (6 credits) | Must be chosen from the BMEn 8000-level course list
|                  | • BMEn 8601 and/or BMEn 8602 - Seminars (3 credits) | Seminars are 1 credit per semester and may be repeated for credit
|                  | Included in the Core and Technical coursework must be at least 6 credits approved as math/stat-intensive. These are not additional credits – they will overlap with other course requirements. |

| Supporting Courses | • Technical Electives (9 credits) | Courses in engineering, physical sciences and mathematics
|                    | • Biology Electives (6 credits) | Medical School coursework can be used to fulfill the Biology Electives and the Free Science/Technical Electives
|                    | • Free Science/Technical Electives (6 credits) |

| Written preliminary exam | Between Year 2 and Year 3 of the PhD phase |
| Oral preliminary exam    | Between Year 2 and Year 3 of the PhD phase |
| Teaching                 | One semester out of every two years |

PhD requirements are on the [BME website](http://example.com).

### Biomedical Informatics and Computational Biology (BICB) Graduate Program

Consult the [BICB Student Handbook](http://example.com) for additional information.

### Chemical Engineering Graduate Program
Consult the Chemical Engineering Handbook for additional information.

Chemistry Graduate Program

Consult the Chemistry Graduate Handbook for additional information.
Epidemiology Graduate Program

There are two tracks in the Epidemiology PhD Graduate Program: Clinical/Biological Epidemiology (CBE) Track, and Social/Behavioral Epidemiology (SBE) Track. There are minor differences between the two tracks. The exact choice of courses is ultimately decided by the student in consultation with the student’s PhD advisor and Director of Graduate Studies. MSTP students are exempted from 10 credits total. The program has fairly strict expectations for prior Masters level epidemiology coursework & prerequisites. If the student does not have an MPH or MS in epidemiology, then the student can expect to take a full year of preparatory coursework that amounts to the methods and design courses of an Epidemiology Masters.

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Supporting Courses</th>
<th>Written preliminary exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PUBH 8341 – Advanced Epidemiological Methods: Concepts (3 credits)</td>
<td>• Both Tracks: 3 credits of additional doctoral level statistical methods (PUBH 8300 part 3 counts for this)</td>
<td>Part A: Comprehensive, 2-day written exam covering the fundamentals of epidemiology, biostatistics and the doctoral-level</td>
</tr>
<tr>
<td>• PUBH 8342 – Advanced Epidemiological Methods: Applications (3 credits)</td>
<td>• Both Tracks: 2 additional credits of content area coursework</td>
<td></td>
</tr>
<tr>
<td>• PUBH 7401 – Fundamentals of Biostatistical Inference (4 credits)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• PUBH 6348 – Writing Research Grants (2 credits)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• PUBH 6742 – Ethics in Public Health: Research and Policy (1 credit)</td>
<td></td>
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<tr>
<td>• GRAD 8100 – Teaching in Higher Education (3 credits)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR GRAD 8200 – Teaching and Learning Topics in Higher Education (1 credit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• PUBH 7420 – Clinical Trials: Design, Implementation and Analysis (3 credits)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR PUBH 6363 – Design and Analysis of Group-Randomized Trials in Epidemiology (3 credits)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5 credits required for MSTP students instead of 13 credits

In content area portion of both tracks, 2 credits (one course) are required instead of 4 credits
epidemiology sequence. Students must complete PUBH 8341 and PUBH 8342 prior to sitting for the exam.

Part B: an independent, simulated Epidemiology grant application. Students are assigned a topic from their 3 suggestions and have 17 days to write a modified grant application that includes aims, background, methods and analysis plan. Students write the grant autonomously and if requested, perform revisions under the guidance of a primary grader. Part B normally requires completion of PubH 6348. Successful completion of Part A is strongly advised prior to starting Part B.

<table>
<thead>
<tr>
<th>Oral preliminary exam</th>
<th>Within 5 years of matriculation, suggested within 6 months of completing Part A and Part B. The content and format of the written proposal to be presented is determined by consultation with the primary adviser and members of the committee.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching</td>
<td>Not required</td>
</tr>
<tr>
<td></td>
<td>MSTP students must take either GRAD 8101 or GRAD 8200</td>
</tr>
</tbody>
</table>

PhD requirements are on the [Epidemiology website](#) and in the [Epidemiology Handbook](#).
## Integrative Biology and Physiology (IBP) Graduate Program

<table>
<thead>
<tr>
<th>Required Courses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• ANSC 5700 – Cell Physiology (4 credits)</td>
<td></td>
</tr>
<tr>
<td>• Biostatistics course (3 or 4 credits, see <a href="#">IBP Handbook</a> for options)</td>
<td></td>
</tr>
<tr>
<td>• PHSL 5096 – Integrative Bio &amp; Phys Advances (1 credit, taken fall year 1, spring year 1, and fall year 2)</td>
<td></td>
</tr>
<tr>
<td>• PHSL 8242 – Professional Skills Development for Biomedical Scientists (1 credit)</td>
<td></td>
</tr>
<tr>
<td>• PHSL 8232 – Critical Journal Reading (2 credits)</td>
<td></td>
</tr>
<tr>
<td>• PHSL 5101 – Medical Physiology (5 credits)</td>
<td>Medical School credits count for PHSL 5101</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supporting Courses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• 12 credits completed in the minor field or supporting program (non-PHSL credits)</td>
<td>Medical School coursework may be used to fulfill supporting course requirement</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Written preliminary exam</th>
<th>Essay format test taken within 2 weeks of completion of spring semester year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral preliminary exam</td>
<td>Oral preliminary exam taken no later than end of fall semester of year 2</td>
</tr>
<tr>
<td>Teaching</td>
<td>None</td>
</tr>
</tbody>
</table>

Consult the [IBP Handbook](#) for additional information.
Medicinal Chemistry Graduate Program

| Required Courses | • MEDC 8001 – General Principles of Medicinal Chemistry (3 credits)  
|                  | • CHEM 8321 – Organic Synthesis (4 credits)  
|                  | • MEDC 8050 – Physical and Mechanistic Organic Chemistry (2 credits)  
|                  | • MEDC 5495 – Vistas in Medicinal Chemistry Research (1 credit)  
|                  | • MEDC 8002 – General Principles of Medicinal Chemistry (3 credits)  
|                  | • MEDC 8435 – Experimental Design and Statistics (1 credit)  
|                  | • MEDC 8100 – Seminar (1 credit)  
|                  | • MEDC 8800 – Lab rotation (1 credit) |

| Supporting Courses | • Two elective courses from the Department of Medicinal Chemistry  
|                    | • One Biochemistry Course  
|                    | • One elective course from inside or outside the Department of Medicinal Chemistry  
| MSTP students can submit a written request to waive the Biochemistry course requirement and the elective course from inside or outside the Department of Medicinal Chemistry |

| Written preliminary exam | Generally the last Thursday and Friday in June at the end of year 1 |
| Oral preliminary exam | Written proposal due July 1 and oral exam in July – August at the end of year 2 |
| Teaching | Not required, but contingent on RA funding from advisor |

Consult the [Medicinal Chemistry Policies and Procedures](#) for additional information.
### Microbiology, Immunology and Cancer Biology (MICaB) Graduate Program

<table>
<thead>
<tr>
<th><strong>Required Courses</strong></th>
<th><strong>Supporting Courses</strong></th>
<th><strong>Written preliminary exam</strong></th>
<th><strong>Oral preliminary exam</strong></th>
<th><strong>Teaching</strong></th>
</tr>
</thead>
</table>
| • MICA 8012 – Integrated Topics in MICaB (2 credits)  
• One of the following:  
  o MICA 8002 – Structure, Function/Bacteria & Viruses (4 credits) OR  
  o MICA 8003 – Immunity and Immunopathobiology (4 credits) OR  
  o MICA 8004 – The Biology of Cancer (4 credits)  
• One focus area science course (5000-level or higher) (minimum of 3 credits) | • 12 credits completed in the minor field or supporting program | Due no later than April 1 of year 1 | Scheduled and completed before the start of fall semester of year 2 | None |

Medical School coursework may be used to fulfill supporting course requirement

Consult the [MICaB Handbook](#) for additional information.
### Molecular, Cellular, Developmental Biology and Genetics (MCDB&G) Graduate Program

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Supporting Courses</th>
<th>Consult with the MCDB&amp;G DGS to discuss specific MSTP curriculum plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>• MCDG 8920 – Special Topics / Itasca Workshop (2 credits)</td>
<td>• Optional</td>
<td></td>
</tr>
<tr>
<td>• 16 total credits from A-F graded classes. A maximum of 13 credits of pre-clinical MD coursework can be used to meet this requirement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Minimum of 3 additional credits (a minimum of one additional graduate class) graded A-F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supporting Courses</th>
<th>Consult with the MCDB&amp;G DGS to discuss specific MSTP curriculum plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written preliminary exam</td>
<td>Fall of Year 2 of the PhD phase</td>
</tr>
<tr>
<td>Oral preliminary exam</td>
<td>Spring of Year 2 of the PhD phase</td>
</tr>
<tr>
<td>Teaching</td>
<td>One semester</td>
</tr>
</tbody>
</table>

The major in MCDB&G requires 16 credits from A-F graded classes. Because pre-clinical course work is not graded A-F, there is a method to convert the pre-clinical non-graded scores to A-F grades. Pre-clinical course work can be transferred if those classes are deemed appropriate. Typically, MD/PhD students must take a minimum of 3 additional credits (a minimum of 1 additional class) graded A-F for the MCDB&G Ph.D. degree. This additional coursework should be related to your emphasis within Molecular, Cellular, Developmental Biology and Genetics (i.e. the additional coursework is intended to facilitate your thesis research) and will be determined by the Student Review Committee in consultation with your thesis advisor and the DGS. In the first year of the graduate phase, students will therefore typically take 1 additional class. MD/PhD students should plan their MCDB&G coursework in consultation with their advisor and then relay a plan to the MCDB&G DGS before entering the program.

Consult the [MCDB&G Handbook](#) for additional information.
<table>
<thead>
<tr>
<th>Required Courses</th>
<th>NSc 5551 – Cell &amp; Molecular Neurobiology Lab at Itasca (4 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NSc 5461 – Cellular &amp; Molecular Neuroscience (4 credits)</td>
</tr>
<tr>
<td></td>
<td>NSc 5561 – Systems Neuroscience (4 credits)</td>
</tr>
<tr>
<td></td>
<td>NSc 5661 – Behavioral Neuroscience (3 credits)</td>
</tr>
<tr>
<td></td>
<td>NSc 8211 – Developmental Neurobiology (3 credits)</td>
</tr>
<tr>
<td></td>
<td>NSc 8321 – Career Skills – Understanding Responsibilities as a Neuroscientist</td>
</tr>
<tr>
<td></td>
<td>Statistics course</td>
</tr>
<tr>
<td></td>
<td>Additional courses, not including statistics (6 credits)</td>
</tr>
<tr>
<td></td>
<td>Itasca begins late July before first year of PhD phase</td>
</tr>
<tr>
<td></td>
<td>NSc 5461 is audited by MSTP students</td>
</tr>
<tr>
<td></td>
<td>NSc 5661 is audited by MSTP students</td>
</tr>
<tr>
<td></td>
<td>Take NSc 8321 in both the fall and spring of Year 1 of PhD phase</td>
</tr>
<tr>
<td></td>
<td>Medical School coursework can be used to fulfill the 6 credits of additional courses</td>
</tr>
<tr>
<td>Supporting Courses</td>
<td>Not required</td>
</tr>
<tr>
<td>Written preliminary exam</td>
<td>In June after the completion of the first year of coursework</td>
</tr>
<tr>
<td>Oral preliminary exam</td>
<td>Written proposal due no later than September 1 of the second year of the PhD phase</td>
</tr>
<tr>
<td></td>
<td>Oral exam completed by January 20 of the second year of the PhD phase</td>
</tr>
<tr>
<td>Teaching</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Written research proposal and training plan in the form of a NIH F30 proposal</td>
</tr>
</tbody>
</table>
Graduate Program in Neuroscience (GPN) Timeline for UMN MSTP Students

0. Year - M1
   a) Prior to matriculation
      1. Communicate with GPN Director of Graduate Studies (DGS) and Associate DGS to identify potential thesis advisors and laboratory rotations
   b) Summer
      1. Research rotation (summer before M1)

1. Year M1
   a) During year
      a. Meet with GPN Director of Graduate Studies (DGS)
   b) Summer
      1. Research rotation(s) (summer between M1 and M2)

2. Year M2
   a) Winter
      1. Identify thesis advisor for graduate training
   b) Summer
      1. Take USMLE Step 1
      2. First clinical rotation
      3. Take NSC 5551 (Itasca Cell And Molecular Neurobiology Laboratory) – end of July to end of August

3. Year G1
   a) Year-round
      1. Prepare and submit F30 (December 8, April 8, and August 8 submission deadlines). Initial application must be submitted by April 8 of Year 4 in MSTP (G2)
   b) Fall
      1. Take NSC 5461 (Cellular and Molecular Neuroscience)
         a. MSTP students audit this course
      2. Take NSC 8217 (Systems and Computational Neuroscience)
         a. MSTP students audit this course
      3. Take NSC 8321 (Career Skills and Understanding Responsibilities As a Neuroscientist)
   c) Spring
      1. Take NSC 8211 (Developmental Neurobiology)
      2. Take NSC 5661 (Behavioral Neuroscience)
      3. Take NSC 8320 (Readings in Neurobiology, Friday AM seminar)
   d) Summer
      1. Complete and Pass Written Preliminary Examination
      2. Written proposal due no later than September 1

4. Year G2
   a) Year-round
      1. Clinical Continuity Experience for Physician Scientist 1 (INMD 7542)
      2. MSTP Grand Rounds presentation
   b) Fall
      1. Take NSC 8320 (Readings in Neurobiology, Neurostatistics)
         a. Satisfies "Quantitative Requirement for MSTP Students"
         b. Other courses can be taken in its place
      2. Take NSC 8321 (Career Skills and Understanding Responsibilities As a Neuroscientist)
      3. Identify GPN thesis committee and chair
a. 4-5 members (including advisor)
b. Have committee approved by GPN DGS
c) Winter
   1. Complete and Pass Oral Preliminary Examination by January 20
d) Spring
   1. Take NSC 8320 (Readings in Neurobiology, Friday AM seminar)
   2. 30-minute presentation at GPN Colloquium (Wednesdays in spring)

5. Year G3
   a) Year-round
      1. Clinical Continuity Experience for Physician Scientist 2 (INMD 7545)
      2. Specific Aims page (spring)
   b) Research
      1. Meet with Thesis Committee twice annually
      2. 30-minute presentation at GPN Colloquium (Wednesdays in spring)

6. Year G4
   c) Year-round
      1. Clinical Foundations (INMD 7545)
   d) Research
      1. Meet with Thesis Committee twice annually
      2. 30-minute presentation at GPN Colloquium (Wednesdays in spring)
   e) Thesis defense
   f) Return to clinic

Consult the GPN Handbook for additional information.
## Pharmacology Graduate Program

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Supporting Courses</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHCL 5110 – Introduction to Pharmacology (3 credits)</td>
<td>Optional (requires approval of the student’s advisor and Pharmacology DGS)</td>
<td>PHCL 5110 is waived for MSTP students</td>
</tr>
<tr>
<td>PHCL 5112 – A Graduate Student Toolkit I: An Introduction to the Scientific Research Lab (1 credit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHCL 8200: Seminar: Selected Topics in Pharmacology (1 credit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHCL 8211 – Advanced Medical Pharmacology (5 credits)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHCL 8212 – Advanced Medical Pharmacology II (3 credits)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHCL 5113 – A Graduate Student Toolkit II: Scientific Speaking and Writing for Graduate Students (2 credits)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Supporting Courses

- **Written preliminary exam**: Submitted no later than June 1 of year 2
- **Oral preliminary exam**: Oral preliminary exam taken and passed no later than December 31 of year 3
- **Teaching**: None

Consult the [Pharmacology Handbook](#) for additional information.
NIH F30/F31 APPLICATIONS
INFORMATION AND CHECKLIST

Current as of August 28, 2017

Program Announcements

- **PA-16-305**: Ruth L. Kirschstein National Research Service Award (NRSA) Fellowship for Students at Institutions With NIH-Funded Institutional Predoctoral Dual-Degree Training Programs (Parent F30)
- **PA-16-309**: Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (Parent F31)
- **PA-16-308**: Ruth L. Kirschstein National Research Service Award Individual Predoctoral Fellowship to Promote Diversity in Health-Related Research (Parent F31 - Diversity)

Key Information

<table>
<thead>
<tr>
<th>Program Announcement:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
</tr>
<tr>
<td>Commons User ID:</td>
<td></td>
</tr>
<tr>
<td>UMN Departmental/Program Grants Administrator:</td>
<td></td>
</tr>
<tr>
<td>- E-mail address</td>
<td></td>
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<tr>
<td>- Phone</td>
<td></td>
</tr>
<tr>
<td>Sponsor (i.e., PhD advisor):</td>
<td></td>
</tr>
<tr>
<td>Sponsor Commons User ID</td>
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<tr>
<td>Co-Sponsor(s) (if any):</td>
<td></td>
</tr>
<tr>
<td>Co-Sponsor Commons User ID</td>
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</tr>
<tr>
<td>Consultants/Collaborators/F-Advisory Committee members:</td>
<td></td>
</tr>
<tr>
<td>Recommendation #1:</td>
<td></td>
</tr>
<tr>
<td>Recommendation #2:</td>
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<td>Recommendation #3:</td>
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<tr>
<td>Recommendation #4:</td>
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<tr>
<td>Recommendation #5:</td>
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<tr>
<td>(not required)</td>
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<tr>
<td>Potential NIH Institutes:</td>
<td></td>
</tr>
<tr>
<td>UMN Report of External Professional Activities (REPA) filing date</td>
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</tr>
<tr>
<td>UMN Financial Conflict of Interest (FCOI) training date</td>
<td></td>
</tr>
<tr>
<td>UMN Responsible Conduct of Research core curriculum completion date (required prior to award set up)</td>
<td></td>
</tr>
<tr>
<td>US citizen or permanent resident?</td>
<td></td>
</tr>
<tr>
<td>Previous NRSA support?</td>
<td></td>
</tr>
<tr>
<td>Veteran’s Administration facilities to be used?</td>
<td></td>
</tr>
<tr>
<td>International work or travel or collaboration planned?</td>
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</tr>
<tr>
<td>Final NIH Institute:</td>
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</tr>
<tr>
<td>NIH Program Officer:</td>
<td></td>
</tr>
<tr>
<td>• E-mail address</td>
<td></td>
</tr>
<tr>
<td>NIH Study Section Request (if required)</td>
<td></td>
</tr>
</tbody>
</table>

**Key Resources**

- **SF424 Guide**
  - Official instructions for preparing the application

- **A Practical Guide to Writing a Ruth L. Kirschstein NRSA Grant**
  - This book was published in 2014, before the new NIH F-award format that began in August, 2016. Parts of the book refer to sections of the application that have now been rearranged and combined into new sections.

- **MSTP F30 F31 applications**
  - The Sweis, Breed, Barks, and Jelenchick applications are in the current NIH format
## F30/F31 CHECKLIST

All files:
- 0.5 inch margins, no headers or footers, no page numbers
- Type density must be no more than 15 characters per linear inch (including characters and spaces). Line spacing must be no more than six lines per vertical inch
- 11 point (minimum) Arial font is compliant with the above requirements. Smaller text in figures, graphs, diagrams and charts is acceptable, as long as it is legible when the page is viewed at 100%. No restriction on text color, but black is recommended. No highlighting/shading of text.
- Color figures should be discernable when printed/viewed in black & white or gray scale
- Must be separate PDF files

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| Description of Institutional Environment & Commitment to Training  
  - Educational Information**                         | 2 pages| Pg. F-68           |                     |            |             |               |
| Training in the Responsible Conduct of Research%    | 1 page | Pg. F-65           | Chpt. 7.3           |            |             |               |
| Facilities & Other Resources                        | No limit| Pg. F-39           |                     |            |             |               |
| Equipment                                            | No limit| Pg. F-39           |                     |            |             |               |
| Project Summary/Abstract                             | 30 lines| Pg. F-37           | Chpt. 7.1           |            |             |               |
| Project Narrative                                    | 1 - 3 sentences | Pg. F-38 | Chpt. 7.2 |            |             |               |
| Biosketches for Sponsor, Co-Sponsor(s), Advisory Committee, etc.  
  - Personal Statement specific to applicant & training |        |                    | Chpt. 4.1    |            |             |               |
| Cover Letter (list reference letter writers)         | 1-2 pages| Pg. F-29           | Chpt. 7.5           |            |             |               |
| Reference Letters                                    | 3 - 5 | NIH Link           | Chpt. 3.5           |            |             |               |

Optional/Conditional Attachments

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^Clinical Training Plan will be provided by MSTP Director
**Educational Information will be provided by MSTP Director
%RCR template available in [Google Drive folder](#)
+For PA-16-308 only, letter can be provided by MSTP Director
The purpose of an Individual Development Plan (IDP) is to: 1) identify professional career goals and objectives; 2) assess your skill set relative to your professional career goals and objective; and 3) develop a plan to acquire skills and competencies necessary to achieve your professional career goals.

An important component of the IDP is to conduct a self-assessment of your skills, strengths, and areas that need further development. You can engage mentors, faculty, colleagues and friends in the assessment process. With your specific career objective in mind, list individual goals for the next year. It is not required that you have a goal in each category. You may have more than one goal in a single category. For each goal, briefly describe how you will measure your progress, actions you will take to achieve your goal, strengths that will help you achieve your goals, any barriers you might face, and a target date for achieving this goal. Your goals should be SMART: specific, measurable, action-oriented, realistic, and time-bound.

The questions for each category are to assist you in thinking about your specific objectives and goals in each area. Specific questions may not be directly applicable to your specific stage of MSTP training.

**Scientific and Medical Knowledge**
- Am I spending enough time and effort on my coursework in order to learn what I need to know?
- Am I adequately prepared for the USMLE Step 1 exam?
- What courses will provide me with the foundational knowledge needed in my field(s) of interest?
- What courses will provide me with the specialized background needed in my field(s) of interest?
- What primary literature should I be reading?
- How do I learn about new developments in my field?

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**Clinical Skills**
- What clinical skills do I need?
- How will I maintain my clinical skills during the graduate phase?
- Am I able to effectively integrate clinical medicine with basic research and vice versa?
- Do I have a plan for identifying a clinical area for my residency and fellowship?

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Research Skills
- What laboratory skills do I need?
- Am I spending enough time and effort in the lab to accomplish my goals?
- Am I managing my time for experiments, reading and writing?
- Can I plan and execute an experiment and record the results in a form that could be published?
- Can I interpret my results and assimilate new knowledge to formulate good scientific questions?
- Am I thinking creatively, troubleshooting my own experiments, and developing my independence?
- Am I willing to learn new techniques and to take risks?
- Do I have a clear plan for completing my PhD thesis research?

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Funding
- What grants will I apply for and when are the deadlines?
- What feedback have I received on my grant writing skills?
- How will I improve my grant writing skills?
Can I write an original and competitive research proposal?

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**Publications and Written Communication Skills**
- Have I developed a focused set of goals that will lead to publication of a paper?
- How do I efficiently translate results into publication quality data?
- How far away am I from my first publication?
- How can I improve my writing?

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Conferences and Oral Communication Skills
- Have I presented my work and/or attended a scientific meeting?
- How can I improve my presentation skills?
- Am I increasing the depth and breadth of my knowledge by attending seminars within and outside of my field?

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Networking
- Have I formed appropriate support relationships with mentors, peers and administrative staff?
- Do I have opportunities to network with individuals who will be a good fit for my future career aspirations?
- Who are key contacts, in addition to my thesis advisor, for editing and helping me think through ideas?
- Am I discussing my timetable for completion and career plans with my mentors?

SPECIFIC Goal

How will you MEASURE your progress?

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**Leadership and Mentoring/Teaching Skills**

- How can I improve my multi-tasking skills?
- Am I seeking out and taking advantage of opportunities to present my research?
- Do I ask questions and enter into discussions in seminars, conferences and journal clubs?
- What opportunities have I had to develop skills related to conflict management?
- Have I had opportunities to supervise others and to serve as a mentor/teacher?
- What leadership experiences have I had that have allowed me to identify objectives, implement plans and acquire decision making skills?

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**Career Goals**

- What are my short-term career goals? How will I achieve these goals within the next two to five years?
- What are my long-term career goals? How will I achieve these goals within the next 10 to 15 years?
- Am I thinking ahead about my next career stage having evaluated my strengths, weaknesses, and passions?

**What are your short-term career goals?**
Have these short-term career goals changed in the past year? If so, why?

What is your long term career objective?

Has this objective changed in the past year? If so, why?

Implement your plan by discussing your goals with your mentors, enlisting the assistance of your mentors in the implementation, and periodically reviewing your progress.

Describe your level of satisfaction with your progress over the past year.

What specific challenges (if any) did you face this year and how did they affect your progress?

At your Annual Progress meeting, please be prepared to discuss the following:

- Are you satisfied with your progress this year and the mentoring you have received? What could be improved this coming year?
- How can the MSTP, your research mentor(s), your clinical mentor(s), and/or your thesis committee help you address any challenges and achieve your goals for the coming year?
- Are you seeking additional faculty members who might help you achieve your goals?

Would you like the MSTP to provide a copy of this Annual IDP Progress Report to your thesis advisor?

☐ Yes  ☐ No

Submit this completed form AND a copy of your NIH biosketch (F30 format) to Yoji Shimizu by E-mail at shimi002@umn.edu no later than June 1.
Clinical Continuity and Clinical Foundations Mentor Information

The table below lists faculty members who have served as Clinical Continuity and/or Clinical Foundations mentors for current and recently graduated students in the MSTP. This is provided as a resource for MSTP students seeking information about potential clinical continuity mentors. The complete MSTP Clinical Continuity and Clinical Foundations Faculty Mentor list is available here.

<table>
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<th>Specialty</th>
<th>Mentor</th>
<th>Students</th>
<th>Student E-mail</th>
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<tbody>
<tr>
<td>Dermatology – Peds</td>
<td>Sheilagh Maguiness</td>
<td>Sakeen Kashem</td>
<td><a href="mailto:kashe007@umn.edu">kashe007@umn.edu</a></td>
</tr>
<tr>
<td>Family Medicine</td>
<td>David Power</td>
<td>Sruthi Valluri</td>
<td><a href="mailto:vall0161@umn.edu">vall0161@umn.edu</a></td>
</tr>
<tr>
<td>Medicine – Cardiology</td>
<td>Daniel Duprez</td>
<td>Lee Meier</td>
<td><a href="mailto:meie0158@umn.edu">meie0158@umn.edu</a></td>
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<tr>
<td>Medicine – Cardiology</td>
<td>Dan Garry</td>
<td>Mayank Verma</td>
<td><a href="mailto:verma014@umn.edu">verma014@umn.edu</a></td>
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<tr>
<td>Medicine – Endocrine</td>
<td>Betsy Seaquist</td>
<td>Michael Lane</td>
<td><a href="mailto:lane0280@umn.edu">lane0280@umn.edu</a></td>
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<td>Medicine – Hem/Onc</td>
<td>Zohar Sachs</td>
<td>Cliff Csizmar</td>
<td><a href="mailto:csizm004@umn.edu">csizm004@umn.edu</a></td>
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<td></td>
<td>Doug Yee</td>
<td>Cam McDonald-Hyman</td>
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Clinical Continuity for Physician Scientist 1 (INMD 7542)
Clinical Continuity for Physician Scientist 2 (INMD 7545)

Clinical Continuity Expectations and Responsibilities

The Clinical Continuity courses for MD/PhD Students occur during the 2\textsuperscript{nd} and 3\textsuperscript{rd} years of the graduate phase and are designed to provide a longitudinal clinical experience with a physician scientist clinical mentor. Each course is 9 months in duration from September to May, following the University of Minnesota academic calendar (“Classes Begin” in September to “End of Semester” in May).

Clinical Continuity 1
- 2\textsuperscript{nd} year of graduate phase
- 16 half-day clinics over 9 months
- Students function as 3\textsuperscript{rd}-year medical student on clinical rotation
- MSTP Grand Rounds presentation (see MSTP Handbook for details)
- Grade: 75% Clinical Attendance and Completion of Online Evaluations, 20% MSTP Grand Rounds presentation, 5% MSTP Grand Rounds attendance

Clinical Continuity 2
- 3\textsuperscript{rd} year of graduate phase
- 16 half-day clinics over 9 months
- Students function as 3\textsuperscript{rd}-year medical student on clinical rotation
- NIH-Style Specific Aims page (see MSTP Handbook for details)
- Grade: 75% Clinical Attendance and Completion of Online Evaluations, 20% Specific Aims page, 5% MSTP Grand Rounds attendance

All students are expected to attend MSTP Grand Rounds. For a grade of “Honors” in the Clinical Continuity courses, only one excused absence from MSTP Grand Rounds is allowed and the student must attend all 16 half-day clinics and complete the online evaluation for each one.

Responsibilities of the Student:

Clinical Continuity 1 and 2: The student is responsible for attending clinic 16 half days during the academic year. The student should work with the mentor to identify clinic times that are mutually agreeable. Students should be prepared for clinic by reviewing patient charts, evaluating patients by taking history and performing a physical examination, presenting their findings to their clinical mentor, evaluating the patient with their mentor and documenting the visit. Clinical grades are based on attendance and completion of the online evaluation for each of the 16 clinic sessions. The student is responsible for identifying one “milestone” for each clinic session, discussing it with the mentor, and completing the online evaluation together with the mentor.

The student will complete online surveys regarding the mentor at the mid-point and end of the course.

Clinical Continuity 1: Students in the 2\textsuperscript{nd} year of the graduate phase will prepare and present an MSTP Grand Rounds presentation of approximately 45 minutes in length regarding a clinical case from clinic or appropriate to a clinical topic. The case should be presented along with a review of the literature. Presentation of the case as an unknown with a good differential diagnosis should be the basis of the presentation.
Clinical Continuity 2: Students in the 3rd year of the graduate phase will prepare a one-page single spaced NIH-style Specific Aims page regarding a clinical problem observed in clinic that requires inquiry to understand the condition and its mechanism. This page is due May 1 of the academic year the course is taken.

Responsibilities of the Mentor:

The mentor is responsible for providing a clinical venue for the student for 16 half days and setting up times to meet with the student. The mentor should be available at the mutually agreed upon times. The mentor should expect the student to function as a 3rd-year medical student. The mentor is encouraged to provide frequent feedback to the student as needed, including completion of the brief online evaluation at the end of each clinic session.

Clinical Continuity 1 mentors should help the student prepare the MSTP Grand Rounds presentation and should be available to attend the MSTP Grand Rounds presentation that will take place in the late afternoon.

Clinical Continuity 2 mentors should advise the student regarding the Specific Aims page and provide feedback to the student regarding the completed Aims.

The mentor or student may contact the MSTP Associate Director, Bryce Binstadt, MD, PhD (binstadt@umn.edu), at any time should there be problems such as non-attendance or other difficulties.
Clinical Foundations for the Physician Scientist (INMD 7548)

Clinical Foundations Expectations and Responsibilities

The Clinical Foundations course for MD/PhD Students occurs during the final year of the graduate phase and is designed to provide a longitudinal clinical experience with a physician scientist clinical mentor. The course is one semester in duration, following the University of Minnesota academic calendar.

Clinical Foundations

- Final year of graduate phase
- 18 half-day clinics over 1 semester, typically Spring semester
- Students function as 3rd-year medical student on clinical rotation
- Online quality improvement (QI) online courses 101-104 (see below) and project proposal
- Grade: 75% Clinical Attendance and Completion of Evaluations, 20% Completion of online QI course and QI Project Proposal (see MSTP Handbook for details), 5% MSTP Grand Rounds attendance

All students are expected to attend MSTP Grand Rounds. For a grade of “Honors” in the Clinical Foundations course, only one excused absence from MSTP Grand Rounds is allowed and the student must attend all 18 half-day clinics and complete an online evaluation for each one.

Responsibilities of the Student:

The student is responsible for attending clinic 18 half days (or equivalent) during the semester. The student should work with the mentor to identify clinic times that are mutually agreeable. Students should be prepared for clinic by reviewing patient charts, evaluating patients by taking history and performing a physical examination, presenting their findings to their clinical mentor, evaluating the patient with their mentor and documenting the visit. Clinical grades are based on attendance and completion of the online evaluation for each of the 18 clinic sessions. The student is responsible for identifying one “milestone” for each clinic session, discussing it with the mentor, and completing the online evaluation together with the mentor.

The student will complete online quality improvement modules 101-104 offered by the Institute for Healthcare Improvement. The student will then prepare a 1-page clinical QI Project Proposal, based on a clinical scenario they have encountered. This should be reviewed with the mentor.

The student will complete an online survey regarding the mentor at the end of the course.

Responsibilities of the Mentor:

The mentor is responsible for providing a clinical venue for the student for 18 half days and setting up times to meet with the student. The mentor should be available at the mutually agreed upon times. The mentor should expect the student to function as a 3rd-year medical student. The mentor is encouraged to provide frequent feedback to the student as needed, including completion of the brief online evaluation at the end of each clinic session.

The mentor will help the student to identify and provide feedback regarding the QI Project Proposal.

The mentor or student may contact the MSTP Associate Director, Bryce Binstadt, MD, PhD (binstadt@umn.edu), at any time should there be problems such as non-attendance or other difficulties.
MSTP Clinical Continuity and Clinical Foundations Evaluation Forms

The following will be sent to the student as an ONLINE SURVEY at the end of each course and mid-way through the 9-month Clinical Continuity Courses.

The MSTP leadership is interested in the quality of clinical mentoring that MSTP students receive during Clinical Continuity and Clinical Foundations courses. The leadership team will use this information to assist future students in selecting clinical mentors. The information you provide will be kept confidential (i.e., the mentor will not see your responses.)

Please take 5-10 minutes to respond to this survey.

Student Name: ____________________
Clinical Mentor Name: _______________

1 = strongly disagree
2 = disagree
3 = neither agree nor disagree
4 = agree
5 = strongly agree

1. My clinical mentor set clear expectations for me.
2. My clinical mentor communicated his/her clinic schedule clearly to me.
3. My clinical mentor provided useful “real-time” feedback regarding my performance in clinic.
4. My clinical mentor provided useful feedback regarding my written documentation (notes).
5. My clinical mentor provided useful guidance and feedback regarding my MSTP Grand Rounds (Clinical Continuity 1), Specific Aims (Clinical Continuity 2), or Quality Improvement project proposal (Clinical Foundations).
6. My clinical mentor provided useful end-of-course feedback to me in person.

Comments: Please provide any additional comments regarding your clinical mentor, particularly constructive suggestions for areas of improvement.
Travel Requirements
Medical Scientist Training Program
University of Minnesota

This document is meant to set guidelines for arranging University travel to conferences and work related events. Full reimbursement cannot be guaranteed if you do not follow these guidelines.

1. You may arrange your own travel, however please note that reimbursement will not take place until after the trip has been completed. The Program can purchase your airfare and registration fees for you but not hotel. You will need to reserve a hotel on your own.

2. Travelers may make reservations at conference hotels at the rates negotiated by the conference. Stays at non–conference hotels are subject to limits on the rate of reimbursement as determined by government rates. University travelers will be reimbursed up to $150 of the government rate for any given location. See Nick or Susan for information about where to find these rates.

3. If you plan to extend your stay either before or after a conference/event, you must submit evidence that the cost of the extended stay airfare does not surpass the cost to attend conference/event only. Perform fare searches for both the extended stay and the standard trip length and submit copies with your reimbursement. University policy for air travel to a conference/event is no departure earlier than the day before and no return later than the day after the conference/event. Failure to provide flight cost comparison documentation will complicate your reimbursement and may result in partial or full denial of the reimbursement by the Medical School Finance Office.

4. Flights must be economy and the best flight value. Frequent flyer miles cannot be used for personal use (MN statute). If you travel a lot you may be asked to show evidence of this.

5. Meal reimbursements are on a per diem basis and do not require receipts. Please note that meals provided by a conference and covered by the registration fee are not eligible for per diem reimbursement. For example, if there is a scheduled lecture at which dinner will be served, you will not be reimbursed for dinner outside of the conference on that day.

6. You must choose the cheapest available mode of transportation. For example, the University requires use of public transportation and shuttles instead of rental cars whenever possible.

7. If a rental car is the most economical option for transportation, then reservations should be made prior to the trip using the University contract with either Enterprise or National Car Rental. These contracts include additional insurance coverage, so any additional optional coverage are non-reimbursable. Midsize car or smaller is required. Often rental car facilities run out of cars so plan ahead!

8. University policy requires that all reimbursement requests be submitted within 60 days of travel. Unjustified delays will likely result in a denied reimbursement request.

07/01/17
Online Resources: Career Development

- **ORCID**
  Information from the University of Minnesota on ORCID, how to get an ORCID ID, and how to add your information

- **BGREAT Career Development Resources**

- **Graduate School Academic and Professional Development**

- **Center for Writing**

- **Center for Educational Innovation**

- **Clinical and Translational Science Institute**

- **MICaB Career Development Program**

- **Neuroscience Career Facilitation Committee**

- **Lasker Lessons in Leadership**

- **Randy Pausch Last Lecture: Achieving Your Childhood Dreams**

- **James Ryan: The 5 Essential Questions**

- **Choosing a Residency as an MD/PhD**

- **Personal Success Factors: Strengths Test Sites**
Online Resources: Writing

- Center for Writing

- Writing a Specific Aims Page
  - Video: The Patterns of Introductions in AIMS Pages
  - Video: Specific Aims and Conclusions in AIMS Pages
  - Specific Aims Worksheet

- Video: Making Scientific Writing Painless

- My Writing Productivity Pipeline

- A Practical Guide to Writing a Ruth L. Kirschstein NRSA Grant

- Video: 8 ways to successfully navigate NIH peer review and get a fellowship grant
Online Resources: Communication

- Tips for a good poster
- Scientific presentations: a cheat sheet
- TED Talk: Talk Nerdy to Me
- 3 Minute Thesis (3MT) Competition
Online Resources: Mentor/Mentee Responsibilities and Relationships

- **Graduate Student Advising**
  Resources from the Graduate School for both graduate students and faculty

- **The PhD Journey: How to Choose a Good Supervisor**

- **AAMC Mentor-Mentee Compact**

- **Student Conflict Resolution Center**
Online Resources: the PhD phase

- Mastering your PhD: starting off on the right foot
- Getting the Most Out of Your Thesis Committee
- Scientific literature: information overload
- How to keep up with the scientific literature
- Citation Management Tools
- Workshops offered by University Libraries on Citation Management Tools
- The National Center for Faculty Development and Diversity is a nationally-recognized, independent organization that provides online career development and mentoring resources for over 89,000 graduate students, post-docs and faculty members. Activate your membership by completing the registration information at the bottom of the NCFDD webpage.
- iBiology: Course: Planning Your Scientific Journey