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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The MSTP Policies and Practices was updated on March 5, 2021. 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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Minneapolis, MN 55455
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Fax: (612) 626-5994
http://www.med.umn.edu/mdphd/

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Fax: (612) 626-4200
http://www.meded.umn.edu

University of Minnesota Graduate School
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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 Associate. 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.

2. PROGRAM GOVERNANCE

2a. MSTP leadership team responsibilities

The specific responsibilities of each member of the MSTP leadership team is outlined in the table below. Additional information is provided in the Appendix.

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<th>Associate Director (Binstadt)</th>
<th>Associate Director (McLoon)</th>
<th>Associate Director (Jacob)</th>
<th>Associate Director (Crawford)</th>
<th>Med School Faculty Advisor (Hertz/Borowsky)</th>
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- Student monitoring and advising
- Admissions and Recruiting
- Diversity Recruitment and Retention
- Diversity, Equity and Inclusion

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2b. 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.

2c. 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 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 and Recruitment Committee.

2d. 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 has primary responsibility for the MSTP Newsletter. In addition, the SAC supervises the activities of the following subcommittees:

- Monthly Meeting Subcommittee
- Social/Volunteer Events Subcommittee
- Retreat Planning Subcommittee
- Diversity and Inclusion Working Group

2e. MSTP Student Admissions and Recruitment Committee

The MSTP Student Admissions and Recruitment Committee (SARC) consists of MSTP students who are in the graduate phase of their training. At least one member of the SARC 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 SARC 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.

2f. MSTP Justice, Equity, Diversity and Inclusion (JEDI) Committee

The mission of the MSTP JEDI committee is to fully address issues of justice, diversity, equity and inclusion (DEI) within the MSTP. These issues may include student experience, faculty diversity, DEI training, and recruitment of new students. The JEDI committee is a continuation and enhancement of the Diversity and Inclusion (DANDI) working group, which has focused on the recruitment and retention of underrepresented minorities within our MSTP. As a student committee with a clearly defined role that is comparable to and distinct from the Student Advisory Committee (SAC), JEDI affirms the program’s dedication to justice, equity, diversity and inclusion.

The JEDI committee will consist of a minimum of six members, with at least one representative from the MD phase and one representative from the PhD phase. There will be a designated chair and co-chair. The JEDI chair and co-chair will agree to serve for two years with alternating start dates to maintain continuity in leadership. Appointment of the JEDI chair or co-chair will be decided by self nomination and vote of all JEDI members. The JEDI chair and co-chair are responsible for making sure that JEDI is fulfilling its mission, but the decisions, work, and priority setting of the committee will be distributed amongst all committee members.

The JEDI committee will hold meetings monthly to discuss JEDI initiatives and any concerns that MSTP students have in relation to DEI. An invitation will be extended to MSTP leadership to join the first 15 minutes of these meetings to discuss any collaborative initiatives that are ongoing between JEDI and MSTP leadership. The MSTP Director and Associate Directors will each attend at least 2 JEDI meetings each year. The JEDI committee chair and co-chair will be responsible for ensuring that one meeting is held every month, but JEDI members can request agenda items or ad hoc meetings. Members of the JEDI committee will meet with all leadership twice a year to discuss goals, initiatives and progress on DEI work within the MSTP. These meetings may take the place of the monthly JEDI meeting.

The JEDI committee will serve as a liaison between the student body and MSTP leadership to address any concerns (e.g., concerns highlighted in the climate survey, or any concerns that arise during a student’s tenure in the MSTP) or any proposals to improve the climate and DEI training within the MSTP. Student groups dedicated to the support of specific populations of students who are underrepresented in science and medicine, such as Women in Science and Medicine (WISM), will be subcommittees of JEDI. At least one member of each of these groups will attend JEDI meetings to provide updates.

At least one JEDI representative (typically the chair or co-chair) will attend each MSTP leadership team meeting (Executive Committee) and Steering Committee discussions related to issues of justice, equity, diversity, and inclusion. MSTP leadership will work with JEDI members to form collaborative initiatives in
relation to DEI work in the MSTP. JEDI members will seek out leadership involvement and provide feedback on their involvement. Continued engagement and partnership with MSTP leadership will provide accountability so that MSTP leadership follows through on actions requested and prioritizes DEI work within their scope as MSTP leadership.

A budget distinct from the SAC budget will be provided to the JEDI committee by the program. Some items that may be funded by this budget include (but are not limited to):

- Speaker honoraria
- Mentorship activities
- Food for MSTP student seminars
- Curriculum development
- Educational material for prospective students, matriculating students and current students

The JEDI committee will have the opportunity to meet with the MSTP External Advisory Board. Two members of the JEDI committee will serve on any search committees to select members of the MSTP leadership team. MSTP leadership will also seek the counsel of the JEDI committee in identifying members of the MSTP Steering Committee.

JEDI will continue efforts started by DANDI and develop new initiatives. Current initiatives include:

- Undergraduate Physician Scientist Mentoring Program
- Hosting a minimum of one monthly meeting annually

### 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 $32,000/year, increasing to $35,000/year upon return to medical school after successful completion of the PhD. 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.

**MSTP students may not engage in any other type of external employment (i.e. other than the MSTP) without prior permission of the Director.**

**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 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 an in-network/out-of-network structure that doesn’t provide special reductions for healthcare at Boynton.
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.** Both plans employ both co-pays and 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 2020-21, this limit was $6,250 for the SHB plan and $2,500 for medical services and $300 for prescriptions with 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:

- Student Health Benefit (SHB) Plan: [https://shb.umn.edu/health-plans/shbp-home](https://shb.umn.edu/health-plans/shbp-home)
- Graduate Assistant (GA) Health Plan: [https://shb.umn.edu/health-plans/gahp-home](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 and the summer before beginning the PhD phase MSTP training. 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.

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 PhD advisor/graduate program. The funding becomes the responsibility of the student’s chosen thesis advisor. It is the student’s responsibility to consult with their advisor and graduate program to determine the policies on stipend, tuition and fees support. The source of support can come from the advisor’s grants, individual fellowships, training grants, or graduate program support. Although advisors 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. For F30 awards, applicants must have matriculated into the MSTP no more than 48 months prior to the due date of the initial application (typically by no later than April of the second year of graduate training). Resources to assist students in the development of NIH F30/F31 fellowship applications are available through the MSTP grant repository. The Program also organizes Grant Review Group meetings for each NIH grant application deadline. Student participation in the Grant Review Group meetings is recommended but not required. 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.

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.

When MSTP students first enter the Program, they complete the RCR core workshop offered by the University of Minnesota’s Research Education and Oversight program. This core workshop is required for all University of Minnesota faculty, postdoctoral fellows and others (including MSTP students) who receive funding for their research and scholarship. The curriculum is based on key concepts and best practices of research integrity. The curriculum follows the life-cycle of a project, discussing issues of concern at each stage and identifying resources and supplemental information related to each. Topics covered include: social and professional responsibilities, reporting misconduct, mentoring, authorship, plagiarism, peer review, fiscal responsibilities, intellectual property, and research data management. This is an online workshop that takes approximately 6 hours to complete. Entering students also receive a copy of “On Being a Scientist: A Guide to Responsible Conduct in Research”, which is published by the National Academy of Sciences.

The Essentials of Clinical Medicine course taken by MSTP students during the first two years of medical school includes a survey of bioethics topics, including social responsibility of the physician, conflict of interest, informed consent, confidentiality, ethical issues in human subjects research, and professionalism.

When MSTP students enter the PhD graduate phase, they complete additional RCR training through interactive workshops and discussion sections offered by the student’s graduate program.

All MSTP students also complete MSTP-specific 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

Each workshop is 1.5 hours in length and is led by a group of MSTP faculty preceptors. The workshops involve case-based interactive discussions of each topic. 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. Students can opt to complete a workshop more than once in order to obtain additional refresher training.

The MSTP offers two RCR Refresher Workshops (3 hours total) each year that utilize case studies and the interactive movie “The Lab: Avoiding Research Misconduct” that has been developed by the NIH Office of Research Integrity. This exercise provides refresher training on topics such as avoiding research misconduct, mentorship responsibilities, handling of data, responsible authorship, and questionable research practices. All MSTP students in the 6th year of the program must complete the Refresher Workshops so that RCR training occurs at least once every 4 years.

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. MSTP Research Showcase faculty presentations
   b. The MSTP website and websites of MSTP partner graduate programs
   c. Other MSTP students
   d. Meetings with the Director and/or Associate Directors
   e. Meetings 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-programsinstitute-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 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 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. This evaluation is confidential and will only be available to MSTP leadership.

7. M1 AND M2 RESEARCH MEETINGS

The MSTP M1 and M2 Research Meetings aim to promote community building and the development of key research and professional development skills that will promote a successful transition to the graduate phase and overall successful career development as a physician scientist. The meetings are a combination of:
   - Research skills development activities
   - Academic and professional development activities
   - MSTP skills and knowledge
   - Student-led discussions on topics of relevance to physician scientists
   - Peer-to-peer mentoring, engagement and support

The complete schedule and relevant files and resources are available on the Canvas site.

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 their laboratory of choice has adequate grant support to cover lab resources and the cost of their stipend.

8a. MSTP Student Research Commitment Statement

A PhD thesis advisor and graduate program must be declared no later than November 15 of the second year in Medical School. Any extensions must be approved by the Director prior to the deadline. 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” page.

8. Provide a copy of your proposed advisor’s Advising Statement.

A Graduate Phase Transition Meeting with members of the MSTP leadership is held no later than January/February of the second year where advisor choices and graduate programs are finalized. Plans for completion of the Step 1 exam and optional clinical clerkships prior to the start of the graduate phase are also discussed at this meeting.

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 or F31 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.

- Development of a written advising statement that outlines the preceptor’s advising philosophy, as well as expectations and responsibilities for both the advisor and the advisee.

- A commitment to continual improvement as an advisor.

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
• Other Support (NIH format)
• Completed Table 2 (NIH T32 training record)
• Advising statement

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

8c. Advising Statements

Establishing clear expectations at the start of an advising relationship is critical and can occur with a discussion of a faculty member’s advising statement. The program expects all faculty preceptors who are advising a MSTP student during the graduate phase to have a written advising statement that outlines the faculty advisor’s mentoring philosophy, as well as expectations and responsibilities for both the advisor and the advisee. Both the MSTP and the Graduate School have developed advising statement templates that can be edited by faculty advisors if desired. Advising statements developed by other faculty members are available on the MSTP website, the Medical School website, and from the Graduate School. These expectations will be discussed during annual review meetings with each PhD phase student and their advisor(s). The intent of this effort is to maximize the potential for a successful PhD research experience by using these statements to increase transparency regarding expectations, and to provide a foundation for ongoing discussions between an advisor and advisee about expectations and responsibilities.

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
• Biomedical Informatics and Computational Biology (BICB)
• Integrative Biology & Physiology (IBP)
• Chemical Engineering
• Chemistry
• Epidemiology
• Health Services Research, Policy and Administration
• Medicinal Chemistry
• Microbiology, Immunology & Cancer Biology (MiCaB)
• Molecular, Cellular, Developmental Biology & Genetics (MCDB&G)
• Neuroscience
• Pharmacology

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 at the time of admission to the MSTP. After the selection of a graduate program, students complete an online application in order to formally enter their chosen graduate program. Personal statements and letters of recommendation are not required. The MSTP office assists students with this process.

9a. Graduate Student Resources

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

- Graduate School Diversity Office
- Graduate School Current Student Toolkit
- Medical School Office of 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 4-8 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

The program recommends, but does not require, that students complete a minimum of one required clinical rotation following completion of USMLE Step 1 during the summer prior to starting the graduate phase. Registration for these rotations is handled by the student’s the MSTP office. Students will work with the MSTP Assistant Director and their Medical School academic advisor in February of Year 2 of Medical School to schedule the rotation(s).

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

- Medicine (8 weeks)
- Pediatrics (4 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 MSTP 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
  
  o 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.
  
  o 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.
  
  o Students will prepare and present a MSTP Grand Rounds presentation as part of this course.
  
  o 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
  
  o See Clinical Continuity Expectations and Responsibilities

- Clinical Continuity Experience for Physician Scientist 2 (INMD 7545) – 3 credits
  
  o 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.
  
  o 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.
  
  o 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

- 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.
  - If desired, completion of INMD 7548 can fulfill one of the required Advanced Selective clerkships.
  - 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

Selecting a MSTP Clinical Continuity Mentor

Students will meet in the summer prior to the start of the second year of the graduate phase with one of the Associate Directors to discuss their 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 a mutually agreeable 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.

11e. NIH Clinical Electives Program (M3 and M4 years)

The NIH Clinical Center, through the Office of Clinical Research Training and Medical Education, offers short term, 4- to 12-week clinically oriented rotations in the Clinical Electives Program (CEP). The focus of the CEP is enhancing the training experience for highly motivated students who are strongly interested in, or committed to, research-oriented careers in academic medicine.

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)

**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; fall, 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, fall)
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.

NSC 8111 – Quantitative Neuroscience
(Offered every fall)
Principles of experimental design and statistical analysis in neuroscience research. Includes an introduction to computer programming for data analysis using both classic and modern quantitative methods.

PUBH 6414 - Biostatistical Literacy
(3.0 cr; online)
Develop ability to read/interpret statistical results in primary literature. Minimal calculation. No formal training in any statistical programming software. Biostatistical Literacy will cover the fundamental concepts of study design, descriptive statistics, hypothesis testing, confidence intervals, odds ratios, relative risks, adjusted models in multiple linear, logistic and Poisson regression, and survival analysis. The focus will be when to use a given method and how to interpret the results, not the actual computation or computer programming to obtain results from raw data.

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.

**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 – Systems Analysis of Biological Processes**
(3.0 cr; spring)
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.

**13. GRADING POLICY**

Students receive pass or no pass grades while in the first two years in Medical School. 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 April 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 short “chalk talk” 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 the thesis defense of other students.

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 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.

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
- 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 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
- 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 final year of the graduate phase are required to give a Clinical/Basic Science Seminar. This presentation is focused on the student’s thesis research, but should incorporate translational aspects of their thesis research that would be of interest to a diverse audience. The educational objective of the Clinical/Basic Science Seminar is to provide an opportunity for students to showcase their research accomplishments at one of the major divisional or departmental clinical conferences (e.g. Pediatrics, Medicine, Lab Medicine Grand Rounds; CIDMTR, Pulmonary, HOT research/clinical conference).

Students should ask their Clinical Continuity or Foundations mentor(s) for advice regarding an appropriate venue for the Clinical/Basic Science Seminar, such as one of the existing research conferences held regularly by each Clinical Science Department in the Medical School. Contact Dr. Binstadt for help if you encounter difficulties in identifying an appropriate venue or scheduling the seminar.

Students should complete the Clinical/Basic Science Seminar requirement before they return to medical school for clinical rotations.

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 credits/weeks is required (85 credits/weeks maximum)
- 56 credits/weeks in the following required courses:
  - Foundational Clerkships (36 weeks) – 3rd year lanes
    - 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) – 4th year clerkships
    - ICU Subinternship (INMD 79xx): 4 weeks
    - Emergency Medicine (EMMD 7500): 4 weeks
    - Advanced Selectives: 2 advanced selectives, each 4 weeks:
      - Consult [https://docs.google.com/document/d/1HsoOxGcE8l052Oyq-DE8rLjEu9yc9dsAPWQhmQ0v08/edit?usp=sharing](https://docs.google.com/document/d/1HsoOxGcE8l052Oyq-DE8rLjEu9yc9dsAPWQhmQ0v08/edit?usp=sharing) for the list of advanced selectives
      - INMD 7548/Clinical Foundations may be used to fulfill one of the advanced selectives if desired
  - Becoming a Doctor (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 “Interdisciplinary Research” form must be completed, which is available from the Medical Education web site at [https://www.med.umn.edu/md-students/academics/coursedirectory/course/interdisciplinary-research](https://www.med.umn.edu/md-students/academics/coursedirectory/course/interdisciplinary-research). Please note that the Medical School will not grant retroactive credit for previous work.

Transfer of PhD coursework credits. Students may use up to 6 credits of graduate-level coursework from your PhD studies to fulfill Medical School elective requirements. This request must be initiated by the student. Contact Susan for the transfer request form.

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>
<thead>
<tr>
<th>Required courses</th>
<th>Course #</th>
<th>Credits/weeks</th>
<th>After M2</th>
<th>Grad phase</th>
<th>M3/M4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Medicine</td>
<td>MED 7500</td>
<td>8</td>
<td></td>
<td></td>
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<tr>
<td>Surgery</td>
<td>SURG 7500</td>
<td>8</td>
<td></td>
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<tr>
<td>Pediatrics</td>
<td>PED 7501</td>
<td>4</td>
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<tr>
<td>Obstetrics/Gynecology</td>
<td>OBST 7500</td>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>Neurology</td>
<td>NEUR 7510</td>
<td>4</td>
<td></td>
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<tr>
<td>Psychiatry</td>
<td>ADPY 7500</td>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>Family Medicine</td>
<td>FMCH 7600</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICU Sub-Internship*</td>
<td>INMD 79xx</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Medicine*</td>
<td>EMMD 7500</td>
<td>4</td>
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<td></td>
<td></td>
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<tr>
<td>Advanced Selective #1</td>
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<td>Advanced Selective #2</td>
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<td>4</td>
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</tbody>
</table>

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### Intersessions

<table>
<thead>
<tr>
<th>Electives</th>
<th>Credits/weeks</th>
<th>After M2</th>
<th>Grad phase</th>
<th>M3/M4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Continuity 1</td>
<td>INMD 7542</td>
<td>3</td>
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<td></td>
</tr>
<tr>
<td>Clinical Continuity 2</td>
<td>INMD 7545</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Must have taken MED 7500 at least 6 weeks prior to the start of ICU Sub-Internship. If taking Surgical ICU Sub-Internship, must also have taken SURG 7500. If taking Neonatal Sub-Internship or Pediatric Sub-Internship, must also have taken PED 7501

**Must have taken MED 7500 and SURG 7500

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 and the student’s academic advisor.

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. MSTP students should generally plan to return to clinic sometime between May and the end of August.

19d. Submitting a Thesis Update Report and M3/M4 Schedule Proposal

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 defend their thesis and return in clinic in 2015 must attend this meeting and begin thinking about their desired M3/M4 schedule in the fall of 2014.
2. Submit a Thesis Update Report and M3/M4 Schedule Proposal (see below)

The Thesis Update Report and M3/M4 Schedule Proposal should be addressed to the MSTP leadership and contain the following:

1. Thesis Update Report. Provide a clear and concise document with the following information:
   a. Student’s name, year entered, thesis advisor, and graduate program
   b. Update on status of manuscripts detailing those papers published, in press, submitted, and in progress
   c. An outline of research progress to date
   d. A timeline of experiments that remain to be completed and publications that remain to be written and submitted before thesis research is completed.
   e. Anticipated or scheduled date of the thesis defense and submission of thesis to the Graduate School.
f. Status of completion of required Clinical Continuity & Clinical Foundations courses

g. Status of Clinical/Basic Science Seminar

2. **Describe your physician scientist career goals, interests and objectives**

3. **M3/M4 Schedule Proposal.** Address the following regarding your proposed return to clinic schedule:
   a. Identify your desired clinical “lane” for returning to clinic. Describe any potential changes to the lane that you have discussed with your Medical School academic advisor and/or the Assistant Director. You should plan to complete all of your M3 Foundational Clerkships within one calendar year after returning to clinic.
   b. Your plan for taking the Step 2 exam
   c. If there are large gaps in your schedule between clerkships, indicate what you will be doing during these periods.
   d. Describe any plans you have for research activities during M3/M4.
   e. Any other issues relevant to your proposal and your career development as a physician scientist

4. **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.

Submit your Thesis Update Report, M3/M4 Schedule Proposal, and completed Year 3/4 scheduling worksheet as a single PDF to Susan Shurson (shurs002@umn.edu) and Yoji Shimizu (shimi002@umn.edu).

Following submission of the Thesis Update Report and M3/M4 Schedule Proposal, students will be scheduled to meet with the MSTP leadership team. The meeting will give students an opportunity to update their status and obtain feedback on the feasibility and appropriateness of their plan.

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

1. You want to be competitive 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 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. Consult the lane schedule and **identify your top 3 lane choices for re-entry to medical school** prior to your meeting with your Medical School academic advisor. You can return to clinic after the start date of your desired clinical lane, but you will need to work with the Assistant Director and your Medical School academic advisor to devise a plan that will allow you to complete all of your M3 Foundational Clerkships within one calendar year after returning to clinic.

   If you are interested in a **longitudinal integrated clerkship** (LIC), you should meet with your academic advisor to discuss the LIC. Students must begin a LIC at a specific date, so you must plan proactively so that you can defend your thesis before the start of the LIC.
5. Electives in your clinical specialty of interest should be completed before residency applications are submitted in Year 4
   a. Students typically complete advanced rotations in their specialty of interest anytime from May through August.

6. If you are planning to do an away rotation:
   a. Apply early!
      i. Additional information about applying to away rotations will come out in January of M3
      ii. Most programs start accepting applications anywhere from February through May of M3 for summer of M4 though there are a small number of schools that accept before that timeframe
   b. The best time to do an away rotation is late summer before start of Year 4 (before residency applications will be reviewed)

7. Take the Step 2 exam no later than late summer/early fall of Year 4. In many specialties, having your Step 2 score available at the time that residency applications are being reviewed is of benefit. Completion of foundational clerkships (Med I, Peds, Ob/Gyn, Psychiatry, Family Medicine, Neurology, Psychiatry) is important for performing well on Step 2.

8. Residency interviews typically occur from early November through January of M4. Plan accordingly.

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

20. INCORPORATING RESEARCH INTO M3 AND M4 YEARS OF MD TRAINING

To bring research experiences into the final two years of medical school, MSTP students may take 6-12 credits/weeks of “research for credit,” spend unscheduled time doing research that will not be counted for credit, or a combination of both. Students may consider returning to the lab where they obtained their PhD, or doing something different. Here are some ideas that may help you think about how to spend your time.

What kind of project do you want to do?

- Do you want to do bench research? If yes, do you:
  o Want to continue to work in your PhD advisor’s lab? If yes, talk to your advisor to develop a plan. This could include writing and submitting additional manuscripts, completing additional experiments related to your PhD thesis research, or developing a new line of investigation.
  o Want to apply methodology you have learned to a new question with a new mentor? If yes, make a list of the methodologies you can bring to a new lab and then consider new research areas/mentors who may want you to set this up in their lab. Ask your PhD mentor or any of the MSTP Steering Committee members for help finding a mentor.
o Want to learn new methodology that can be applied to your past research? If yes, meet with your PhD mentor or a faculty member whose research is in the same area

• Do you want to address a clinical question using real world data from the electronic medical record?
  o Meet with any of the clinical continuity mentors in the specialty area where you have an interest to formulate a question
  o Meet with the Informatics Consulting Service to learn about the clinical data repository
  o Meet with the Biostatistical Design and Analysis Center to develop plans for design and analysis

• Do you want to use stored samples to address a question about a human disease?
  o Meet with any of the clinical continuity mentors or lab based scientists in the specialty area where you have an interest to formulate a question
  o Determine availability of samples in Bionet
  o Meet with the Biostatistical Design and Analysis Center to develop plans for design and analysis

• Do you want to use existing data sets to address new questions?
  o Talk to faculty who are involved or have been involved in multicenter clinical trials about accessing data collected in the course of the study
  o Talk to faculty involved in “–omics” about availability of large data sets you could use to address new questions
  o Talk to faculty who have access to and are skilled in analysis of large datasets like Medicare, UKPDS, etc.
  o Meet with the Informatics Consulting Service to learn how to manage these data sets

• Do you want to do research in human subjects?
  o Find out what studies are currently recruiting research subjects at study finder. This will lead you to faculty mentors with whom to work.
  o Meet with any of the clinical continuity mentors in the specialty area where you have an interest to find investigators doing human subjects research.

What kind of time commitment are you willing to make?
• A continuous stretch of many weeks in a row may be more suitable for existing projects that have already received all the regulatory approvals necessary to proceed
• A few weeks at different time points during years 3/4 may be more suitable for new projects that will require regulatory approvals.

What are your expectations of the experience?
• Exposure to a new kind of research. Often, you can just show up and learn what others are doing.
• Publication. This expectation will require more planning up front and sticking to a timeline.

Will you need resources?
• Consider applying for a University of Minnesota Foundation Medical Student Research Grant
• Consider applying for a CTSI Translational Research and Development Program (TRDP) grant
• If you want to go abroad to do a project consider applying for a Walter H. Judd International Graduate and Professional Fellowship
• Talk to your mentors about specialty foundation awards in your area of interest.

Case reports or review articles.
Having finished your PhD, you know how to write scientific papers. Use these skills. These activities can typically be done during your other clerkships (i.e., they do not require elective time), although they often require more work than is anticipated.

- Let your clinical mentors know that you are interested in writing a case report/series or a review article. If you identify an interesting case or series of cases, bring it to the attention of your clinical mentor. Or ask your mentors if they have interesting cases to report.
- Let your PhD mentor or thesis committee members know that you are interested in writing a review article with them, if they are invited to write one.

21. RESIDENCY MATCH SUPPORT

The MSTP and Medical School provide several programs and services to assist in a successful residency match for MSTP students.

1. MSTP leadership holds one-on-one meetings with each MSTP student at the end of the third year of medical school and during the application process. These meetings are to discuss residency plans, discuss the application process, and discuss the personal statement and MSPE letter. The MSTP Medical School faculty advisor is responsible for the MSPE letter, with additional input provided by the MSTP leadership team. Additional meetings are held during the interview process as needed and prior to the submission of the student’s rank list.

2. Advice on developing a strong personal statement is available here.

3. The Medical School Residency Match Coordinator provides clinical students with a variety of career advising resources. This includes: 1) maintaining a list of dedicated specialty-specific experts who assist with residency applications and preparation for the Match, 2) developing online resources for specialty decision-making, 3) implementing a longitudinal career exploration program with emphasis on the AAMC Careers in Medicine (CiM) tool and 4) standardizing the career advising approach provided by the MSTP Medical School Faculty Advisor.

4. Specialty-specific Advisors are Medical School faculty within clinical departments who serve as a resource for students to learn more about, and make connections in, individual specialties. These experts provide informal networking and advocacy, share their insights about their specialty and residency programs and assist students in considerations related to the residency application process. The Specialty Experts list is located here.

5. Second-year students are introduced to all major specialties via a “Specialty Series,” providing contact information and guidance on their career interests while third-year students receive a Residency Match primer outlining the Match process. A residency workshop is also offered providing specific information about Match timelines and requirements, and the Residency Match Coordinator takes students through the entire Match process.

22. 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 is 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 program 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 and professionalism in accordance with the policies and practices of the MSTP, 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. Submission of required written updates, including (but not limited to) the Research Commitment Statement, and the Thesis Update Report and M3/M4 Schedule Proposal.
   d. Attendance and participation in the annual MSTP retreat.
   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.

6. Successful completion of all clinical requirements and graduation from Medical School no more than two years after completing the PhD.
23. REMEDIES FOR UNSATISFACTORY STUDENT PROGRESS

Any student not meeting the required elements of satisfactory progress or having non-academic problems will be requested to meet with the Director. Upon clarification of the circumstance or identifying potential 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.

24. 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, including health insurance coverage, during the leave of absence will be dictated by the circumstances, under the authority of the Director.

25. PARENTAL LEAVE

The MSTP supports students wishing to take parental leave. The timing and duration of leave is based on the student’s appointment in the program. Graduate programs abide by the University of Minnesota Reagents Policy on Parental Leave for Employees. Students who are supported by an NIH institutional research training grant (T-award) or an individual research training fellowship (F-award) may abide by the NIH Parental Leave Policy for Ruth L. Kirschstein National Research Service Awards, which differs from the University of Minnesota policy. The Medical School does not strictly adhere to the University of Minnesota Reagents Policy on Parental Leave for Academic Employees, as this policy only applies to University employees. However, this policy is followed as closely as possible for medical students. Students in the MD phase of training are encouraged to reach out to Dr. Michael Kim (mikekim@umn.edu), Assistant Dean for Student Affairs in the Medical School, and to Dr. Shimizu, MSTP Director, to create an individual plan.

26. 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.

27. PROGRAM MEETINGS AND STUDENT-INITIATED ACTIVITIES

27a. Monday M1 and M2 Research Meetings
The MSTP M1 and M2 Research Meetings (Mondays at 12:15 PM) aim to promote community building and the development of key research and professional development skills that will promote a successful transition to the graduate phase and overall successful 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 various topics relevant to science and medicine

27b. 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.

27c. 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.

27d. 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.

27e. 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.

27f. 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, the final round of the Medical School’s 3 Minute Thesis Competition, and a guest keynote address. MSTP students in the graduate phase are strongly encouraged to submit an abstract and participate in the poster session.

27g. 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.

28. 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.
29. FELLOWSHIPS AND AWARDS
The Program expects MSTP students to apply for internal and external predoctoral fellowships, particularly NIH F30/F31 awards.

29a. NIH F30 and F31 Predoctoral Fellowship

Information on NIH F30/F31 awards is available online at 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.
- Copies of F30/F31 applications prepared by MSTP students, information on the NIH review criteria, and information provided at the yearly NIH F30/F31 workshop are available in the MSTP Grant Repository. Students will receive a link to this information before entering the graduate phase.
- 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
- MSTP Grant Review Group meetings are held before each F-award application deadline. Students preparing an F-award application meet 4 times to receive feedback on a section of their application from faculty and students. MSTP students are strongly encouraged to participate as peer reviewers in these meetings.

29b. American Heart Association Predoctoral Fellowship

The American Heart Association Predoctoral Fellowship aims to “enhance the integrated research and clinical training of promising students who are matriculated in pre-doctoral or clinical health professional degree training programs and who intend careers as scientists, physician-scientists or other clinician-scientists, or related careers aimed at improving global cardiovascular, cerebrovascular and brain health.” 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 here.

29c. 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/preceptorships
29d. 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, including eligibility criteria, is available at http://www.pdsoros.org/.

29e. 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.

29f. 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.

29g. ASH Minority Hematology Graduate Award

The ASH Minority Hematology Graduate Award (MHGA) encourages graduate students from historically underrepresented minority groups in the United States and Canada to pursue a career in academic hematology. The award provides funding for students conducting research on hematology-focused projects and is open to doctoral students in their first, second, or third year of graduate school at the time of application.

29h. Hispanic Scholarship Fund

The HSF Scholarship is designed to assist students of Hispanic heritage obtain a university degree. Graduate students are eligible.

29i. Lasker Essay Contest

The Lasker Essay Contest engages young scientists and clinicians from the US and around the globe in a discussion about big questions in biology and medicine and the role of biomedical research in our society today. The Contest aims to build skills in communicating important medical and scientific issues to broad audiences. The topic is announced annually in early February.

29j. 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://grad.umn.edu/funding/program-requests-nominations/requests/bridging-funds.
29k. 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.

29l. Doctoral Dissertation Fellowship (DDF)

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.

29m. Interdisciplinary Doctoral Fellowship (IDF)

The Interdisciplinary Doctoral Fellowship (IDF) provides a unique opportunity for outstanding PhD students who are engaged in interdisciplinary research to study with faculty at one of the University of Minnesota’s interdisciplinary research centers or institutes during the fellowship year. Applicants designate the host center or institute they believe is the best match with their planned dissertation topic, contingent upon endorsement by the host center or institute. Applicants should check with mentors and directors early to ensure a good match. All application materials are forwarded to the student’s graduate program for submission to the Graduate School.

29n. Endowed Fellowships Administered by the Graduate School

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

29o. 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.

29p. 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.

29q. CTSI TRACT TL1 Program

The Translational Research and Career Training (TRACT) program is an NIH-funded TL1 program for pre- and post-doctoral scholars that provides comprehensive, flexible training for a diverse cohort of predoctoral
and postdoctoral trainees who are committed to a substantive and impactful career in translational research and team science.

29r. 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.

30. MISCELLANEOUS POLICIES AND PRACTICES

30a. Vacation policy.

MSTP 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.

30b. 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.

30c. 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.

30d. 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.
30e. 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.

31. 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.

31a. 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.

31b. 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.

31c. 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.)

31d. 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.

Let's Talk is a program that provides informal virtual drop-in consultations for U of M students throughout the academic year. No appointment is necessary, so you can drop in virtually during the scheduled times. Let’s Talk is not a substitute for formal counseling and does not constitute mental health treatment, but counselors can listen to specific problems, provide support, help explore solutions and give information about other resources.

SCS offers a range of online educational workshops, affinity groups to connect and create community, and therapy groups for increased support and moving toward healing or change around specific challenges.
Students are able to learn new skills and strategies, connect with one another, and share difficulties and experiences in a safe, supportive online environment. Further information is available here.

31e. 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.

31f. 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.

31g. 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.

31h. de-stress

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

31i. Online therapy

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

31j. 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).

31k. 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.

31l. 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.”

31m. BIPOC Mental Health Collective

This collective meets virtually monthly for a wellness activity and small group discussions. Folks are able to choose which breakout room to join and our rooms for this month are Grad Student Mental Health, Wellness, Problem Solving/Strategizing, and Current Events.

31n. 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

31o. University Recreation and Wellness

Exercise and physical activity are important factors 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, have an additional fee. The Rec Center also offers a host of equipment for rental, including ski equipment, paddleboards, kayaks, etc. Further details about special features such as classes, lessons, and outdoor equipment rental can be found on the University Recreation and Wellness website.
### 32. 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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</thead>
<tbody>
<tr>
<td><strong>Summer before Year 1</strong></td>
<td>- Lab rotation&lt;br&gt;- Monday M1 and M2 Research Meetings&lt;br&gt;- Responsible Conduct in Research training&lt;br&gt;- Meet with Director (July)</td>
</tr>
<tr>
<td><strong>Year 1</strong></td>
<td>- First year Medical School curriculum&lt;br&gt;- Monday M1 and M2 Research Meetings&lt;br&gt;- Meet with Director (fall)&lt;br&gt;- Submit plan for completion of additional 1 or 2 rotations (April)&lt;br&gt;- Lab rotation (optional, spring semester only)&lt;br&gt;- Submit annual IDP Progress Report (June 1)&lt;br&gt;- Meet with Director (June/July)</td>
</tr>
<tr>
<td><strong>Summer of Year 1</strong></td>
<td>- Lab rotation (1 or 2)&lt;br&gt;- Responsible Conduct in Research training</td>
</tr>
<tr>
<td><strong>Year 2</strong></td>
<td>- Second year Medical School curriculum&lt;br&gt;- Monday M1 and M2 Research Meetings&lt;br&gt;- Complete laboratory rotations&lt;br&gt;- Choose thesis advisor/Graduate Program and submit MSTP Student Research Commitment Statement (January 1)&lt;br&gt;- Graduate Phase Transition Meeting&lt;br&gt;- Submit annual progress report (June 1)</td>
</tr>
<tr>
<td><strong>May-June of Year 2</strong></td>
<td>- USMLE Step 1 Examination</td>
</tr>
<tr>
<td><strong>June-August of Year 2</strong></td>
<td>- Complete clinical rotation(s) (optional)&lt;br&gt;- Meet with Director (August)</td>
</tr>
<tr>
<td><strong>Graduate Phase Years 3-6</strong></td>
<td>- Complete required graduate courses&lt;br&gt;- Initiate full-time thesis research&lt;br&gt;- Seek independent funding by submitting a NIH F-series predoctoral fellowship application (or equivalent)&lt;br&gt;- Present research at Biomedical Sciences Graduate Programs Research Recognition Day (annually)&lt;br&gt;- Submit annual progress report (June 1)&lt;br&gt;- Meet with annual progress review committee (annually)&lt;br&gt;- Present chalk talk at MSTP Annual Retreat (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 6-9 months)</td>
</tr>
<tr>
<td>Year 7</td>
<td>Year 8</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>Enroll and complete Clinical Continuity Experience for Physician Scientists 1 (year 2 of graduate phase)</td>
<td>Apply to residency training programs</td>
</tr>
<tr>
<td>Present a minimum of one MSTP Grand Rounds (in year 2 of graduate phase)</td>
<td>Complete clinical rotations</td>
</tr>
<tr>
<td>Enroll and complete Clinical Continuity Experience for Physician Scientists 2 (year 3 of graduate phase)</td>
<td>USMLE Step 2 Examinations</td>
</tr>
<tr>
<td>Enroll and complete Clinical Foundations for the Physician Scientist (end of graduate phase)</td>
<td>Meet with Director and Associate Directors after completion of residency interviews and before submission of residency rank list (January/February)</td>
</tr>
<tr>
<td>Present research at a minimum of two national/international conferences</td>
<td>Residency Match results (March)</td>
</tr>
<tr>
<td>Present research seminar at MSTP student monthly meeting (middle of grad phase year 3)</td>
<td>Complete Program with both MD and PhD degrees</td>
</tr>
<tr>
<td>Submit M3/M4 Schedule Request (by November 1 of last year of graduate phase)</td>
<td>Attend Medical School graduation</td>
</tr>
<tr>
<td>Submit Thesis Update Report (by January 31 of last year of graduate phase)</td>
<td>Meet with MSTP leadership (exit interview)</td>
</tr>
<tr>
<td>Present Clinical/Basic Science Seminar (last year of graduate phase)</td>
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<tr>
<td>Publish at least one first-authored paper in a peer-reviewed journal prior to return to clinic</td>
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<tr>
<td>Write, defend and submit thesis no later than the end of the fourth year in graduate phase</td>
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<tr>
<td>Resume clinical rotations</td>
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<tr>
<td>Submit annual progress report (June 1)</td>
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<tr>
<td>Meet with Director, MSTP Faculty Advisor, and Associate Directors (June - August) for residency application preparation</td>
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<tr>
<td>Prepare residency application</td>
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# UNIVERSITY OF MINNESOTA MSTP TRAINING TIMELINE

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<tr>
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<td>MD courses</td>
<td>Research</td>
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<td>USMLE Step I &amp; Clerkship</td>
<td>PhD courses</td>
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<td>PhD courses</td>
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<td>GRAD 1</td>
<td>MSTP Grand Rounds</td>
<td>Clinical Continuity 1</td>
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<td>GRAD 2</td>
<td>Clinical Continuity 2</td>
<td>Clinical Continuity 2</td>
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<tr>
<td>GRAD 3</td>
<td>Specific Aims Proposal</td>
<td>Clinical Continuity 2</td>
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<tr>
<td>GRAD 4</td>
<td>MSTP Grand Rounds</td>
<td>Clinical Continuity 2</td>
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<td>Clinical Foundations</td>
<td>Clinical Continuity 2</td>
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<td>Clinical/Basic Science Seminar</td>
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<td>MS 3</td>
<td>Clerkships</td>
<td>Research Elective</td>
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<td>MS 4</td>
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33. POLICIES AND PROCEDURES OF THE COMMITTEE ON STUDENT SCHOLASTIC STANDING

The Committee on Student Scholastic Standing (COSS) defines policy on Satisfactory Academic Progress, which is measured by quantitative measures (i.e., grades), qualitative measures (i.e., pace of progression), and time frame. More information can be found on the Medical Student Policies website.
Appendix

MSTP Executive Committee
April 2020

Yoji Shimizu, PhD
MSTP Director
Dept. of Laboratory Medicine and Pathology
Graduate programs: MICaB, MCDB&G

Suma Jacob, MD, PhD
Dept. of Psychiatry and Behavioral Sciences
Graduate program: Neuroscience

Bryce Binstadt, MD, PhD
MSTP Associate Director
Dept. of Pediatrics
Graduate program: MICaB

Linda McLoon, PhD
Dept. of Ophthalmology and Visual Neurosciences
Graduate programs: Neuroscience, MCDB&G

Peter Crawford, MD, PhD
MSTP Associate Director
Dept. of Medicine
Graduate program: BMBB, BICB

Susan Shurson, MA
MSTP Assistant Director
Iris Borowsky, MD, PhD
Dept. of Pediatrics
Medical School Faculty Advisor for MSTP Students

Marshall Hertz, MD
Dept. of Medicine
Medical School Faculty Advisor for MSTP Students

Bayardo Garay
Student Advisory Committee Representative
Graduate program: Neuroscience

Ifeolu Akinnola
JEDI Representative
Graduate program: IBP
<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yoji Shimizu, PhD</td>
<td>Laboratory Medicine and Pathology</td>
</tr>
<tr>
<td>Bryce Binstadt, MD, PhD</td>
<td>Pediatrics</td>
</tr>
<tr>
<td>Peter Crawford, MD, PhD</td>
<td>Medicine</td>
</tr>
<tr>
<td>Suma Jacob, MD, PhD</td>
<td>Psychiatry and Behavioral Science</td>
</tr>
<tr>
<td>Linda McLoon, PhD</td>
<td>Ophthalmology and Visual Neurosciences</td>
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<tr>
<td>Esther Krook-Magnunson, PhD (2021)</td>
<td>Neuroscience</td>
</tr>
<tr>
<td>Erik Peterson, MD (2021)</td>
<td>Medicine</td>
</tr>
<tr>
<td>Chad Myers, PhD (2021)</td>
<td>Computer Science and Engineering</td>
</tr>
<tr>
<td>Rita Perlingeiro, PhD (2021)</td>
<td>Medicine</td>
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<tr>
<td>Patrick Alford, PhD (2021)</td>
<td>Biomedical Engineering</td>
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<tr>
<td>Anthony Baugn, PhD (2022)</td>
<td>Microbiology and Immunology</td>
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<tr>
<td>Carol Lange, PhD (2022)</td>
<td>Medicine</td>
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<tr>
<td>Melena Bellin, MD (2022)</td>
<td>Pediatrics</td>
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<tr>
<td>David Boulware, MD, MPH (2022)</td>
<td>Medicine</td>
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<tr>
<td>David Potter, MD, PhD (2022)</td>
<td>Medicine</td>
</tr>
<tr>
<td>Carston Wagner, PhD (2023)</td>
<td>Medicinal Chemistry</td>
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<tr>
<td>Tyler Bold, MD, PhD (2023)</td>
<td>Medicine</td>
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<tr>
<td>Laura Niedernhofer, MD, PhD (2023)</td>
<td>Biochemistry, Molecular Biology &amp; Biophysics</td>
</tr>
<tr>
<td>Zohar Sachs, MD, PhD (2023)</td>
<td>Medicine</td>
</tr>
<tr>
<td>Kaylee Schwertfeger, PhD (2023)</td>
<td>Laboratory Medicine and Pathology</td>
</tr>
<tr>
<td>Peter Bitterman, MD (2024)</td>
<td>Medicine</td>
</tr>
<tr>
<td>Laurie Parker, PhD (2024)</td>
<td>Biochemistry, Molecular Biology &amp; Biophysics</td>
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<tr>
<td>Yasushi Nakagawa, MD, PhD (2024)</td>
<td>Neuroscience</td>
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<tr>
<td>Heather Nelson, PhD (2024)</td>
<td>Epidemiology and Community Health</td>
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<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Dimple Patel**</td>
<td>Associate Dean for Admissions</td>
</tr>
<tr>
<td>Susan Shurson**</td>
<td>MSTP Assistant Director</td>
</tr>
</tbody>
</table>

**ex officio
MSTP Student Advisory Committee  
2020 - 2021  

mstp-student-advisory@lists.umn.edu

Google Drive folder

Michelle Corkrum 2020-2021 2012 entering class
Lien Phung 2020-2022 2014 entering class
Chris Tucker 2019-2021 2014 entering class
Megan Schmit 2020-2022 2015 entering class
Robin Lee 2019-2021 2015 entering class
Kevin Lin 2020-2022 2016 entering class
Julia Riedl 2019-2021 2016 entering class
Adrine Kocharian** 2020-2022 2017 entering class
Bayardo Garay* 2019-2021 2017 entering class
Riley Shearer 2020-2022 2018 entering class
Mahima Devarajan 2019-2021 2018 entering class
Andrea Maxwell 2020-2022 2019 entering class
Laura Padilla 2019-2020 2019 entering class
Sarah Wall 2020-2021 2020 entering class
Sinibaldo Romero Arocha 2020-2022 2020 entering class

*SAC Chair  
**SAC Co-Chair

Executive Committee Student Representatives
Bayardo Garay  
Adrine Kocharian

University of Minnesota MSTP APSA Representatives
German Velez Reyes  
Natalie David  
Phil Titcombe

COGS Representative
Megan Schmit

Research Recognition Day Committee Representative
Brian Trieu

Medical Student Council Representative
Olivia Smith

Monthly Meeting Subcommittee
Michael Anderson  
Taylor Brown  
Fathima Mohamed  
Megan Schmit
Retreat Planning Subcommittee
Jovany Betancourt
Taylor Brown
Arthur de la Cruz-Lynch

Social Subcommittee
Mahima Devarajan
Erik Faber
Riley Shearer
Jose Valentin Lopez

Volunteer Subcommittee:
Natalie David
Minna Ding
Allison Dona
Paul Wang
MSTP Student Admissions and Recruitment Committee
2020 - 2021

Sara Bolivar Wagers (co-chair)
Caleb Vogt (co-chair)
Michael Anderson
Taylor Brown
Rebecca Butler
Minna Ding
Kevin Lin
Fathima Mohamed
Elizabeth Okafor
Javier Sierra Pagan
MSTP Justice, Equity, Diversity and Inclusion (JEDI) Committee
2020 - 2021
mstp-jedi@umn.edu

Ifeolu Akinnola (co-chair)
Dominique Earland (co-chair)
Anisha Adke
Kate Dembny
Mahima Devarajan
Rebecca Goldblum
Kacey Guenther Bui
Edith Hernandez
Alexandria Kristensen Cabrera
Andrea Maxwell
Fathima Mohamed
Laura Padilla
Stephanie Rhee
Megan Schmit
Blake Stagg
Brian Trieu
Sruthi Valluri

Women in Science and Medicine
Anisha Adke
Taylor Brown
Natalie David
Kate Dembny
Mahima Devarajan
Allison Dona
Kate Fallon
Rebecca Goldblum
Edith Hernandez
Guldamla Kalender
Fathima Mohamed
Lien Phung
Julia Riedl
Megan Schmit
### 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>Aaron Goldstrohm, PhD</td>
<td>626-7497</td>
<td><a href="mailto:agoldstr@umn.edu">agoldstr@umn.edu</a></td>
</tr>
<tr>
<td>Biomedical Engineering (BME)</td>
<td>Casim Sarkar, PhD</td>
<td>626-0525</td>
<td><a href="mailto:csarkar@umn.edu">csarkar@umn.edu</a></td>
</tr>
<tr>
<td>Biomedical Informatics &amp; Computational Biology (BICB)</td>
<td>Chad Myers, PhD</td>
<td>624-8306</td>
<td><a href="mailto:chadm@umn.edu">chadm@umn.edu</a></td>
</tr>
<tr>
<td>Chemistry</td>
<td>Aaron Massari, PhD</td>
<td>626-8146</td>
<td><a href="mailto:massari@umn.edu">massari@umn.edu</a></td>
</tr>
<tr>
<td>Epidemiology</td>
<td>Richard Maclehose, PhD</td>
<td>624-1932</td>
<td><a href="mailto:macl0029@umn.edu">macl0029@umn.edu</a></td>
</tr>
<tr>
<td>Health Services Research, Policy and Administration</td>
<td>Donna McAlpine, PhD</td>
<td>625-9919</td>
<td><a href="mailto:mcalp004@umn.edu">mcalp004@umn.edu</a></td>
</tr>
<tr>
<td>Integrative Biology &amp; Physiology (IBP)</td>
<td>Jop van Berlo, MD, PhD</td>
<td>626-1853</td>
<td><a href="mailto:jvanberl@umn.edu">jvanberl@umn.edu</a></td>
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<tr>
<td>Medicinal Chemistry</td>
<td>Daniel Harki, PhD</td>
<td>625-8687</td>
<td><a href="mailto:dharki@umn.edu">dharki@umn.edu</a></td>
</tr>
<tr>
<td>Microbiology, Immunology &amp; Cancer Biology (MICaB)</td>
<td>Wade Bresnahan, PhD</td>
<td>626-5876</td>
<td><a href="mailto:bresn013@umn.edu">bresn013@umn.edu</a></td>
</tr>
<tr>
<td>Molecular, Cellular, Developmental Biology &amp; Genetics (MCDB&amp;G)</td>
<td>Sivaraj Sivaramakrishnan, PhD</td>
<td>612-301-1537</td>
<td><a href="mailto:sivaraj@umn.edu">sivaraj@umn.edu</a></td>
</tr>
<tr>
<td></td>
<td>Scott McIvor, PhD</td>
<td>626-1497</td>
<td><a href="mailto:mcivo001@umn.edu">mcivo001@umn.edu</a></td>
</tr>
<tr>
<td>Neuroscience</td>
<td>Lucy Vulchanova, PhD</td>
<td>626-5726</td>
<td><a href="mailto:vulch001@umn.edu">vulch001@umn.edu</a></td>
</tr>
<tr>
<td>Pharmacology</td>
<td>Colin Campbell, PhD</td>
<td>625-8986</td>
<td><a href="mailto:campb034@umn.edu">campb034@umn.edu</a></td>
</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
24 hour helpline: (612) 626-9111

Behavioral Consultation Team
(612) 626-3030
Advising Statements: Setting up Advisor-Advisee Ground Rules and Expectations

Establishing clear expectations at the start of an advising relationship is critical and can occur with a discussion of a faculty member’s advising statement. We strongly recommend that each MSTP faculty preceptor develop an advising statement that outlines key expectations and responsibilities. We provide an example on the next page with some minimal expectations for MSTP students pursuing a PhD. Faculty members can use this example advising statement as a template, but should feel free to modify this statement so that it accurately reflects their own advising philosophy and expectations. For example, a faculty member may have different expectations with regard to number of first-authored publications or more defined expectations with regard to work hours. Such expectations should be clearly described so that trainees are fully aware of what is expected in order to have a successful PhD training experience. Additional advising statements are available from members of the MSTP leadership team and also available online.

Mentor and mentee need to communicate clearly from the start about your respective roles and responsibilities. These might include:

- **Goals:** develop and share a work plan that includes short-term and long-term goals as well as the timeframe for reaching those goals. Make sure the work plan meets the program’s requirements and is feasible. Make clear that the mentee is to achieve these goals with the support of the mentor and that the mentor is responsible for keeping the mentee accountable.

- **Laboratory Research Goals:** share the short-term and long-term goals that you have set for your laboratory’s overall research program so that your mentees can understand how their specific projects fit within this larger vision.

- **Meetings:** Establish a meeting schedule that includes a defined frequency of contact. Keep the mentee informed if you have a busy travel schedule, are about to take a sabbatical, or will be assuming an administrative position that may impact the frequency of meetings. Assign the mentee the responsibility to take the lead in these meetings.

- **Thresholds:** Be explicit about the kinds of issues the mentor and mentee feel require a face-to-face meeting. Clarify when and how mentor and mentee can be contacted including contact at home. Establish rules for expectations about rapidity of response to inquiries via email and in person.

- **Assessments and Feedback:** Establish a schedule for when the mentor will provide an assessment of the mentee’s general progress, a format that will be used in providing feedback and constructive criticism. Do the same for planned assignments of the mentor by the mentee.

- **Drafts:** Establish expectations of what first drafts should look like before they are submitted to the mentor.

- **Publishing and Presenting:** Establish expectations regarding when and where you would like to see the mentee give research presentations. Explain the standards and norms for authorship credit in your field, and the extent to which you can assist them with preparing work for submission to journals and conferences.

- **Intellectual Property:** Before beginning work on a project, clarify who owns the data that is being collected, and whether others will have access to it. Also discuss issues of copyright and potential patent agreements.

- **Lab Culture:** Describe the type of work environment that you are striving to develop in your lab.
Example Advising Statement
Medical Scientist Training Program (MD/PhD)
University of Minnesota

I believe my role as a PhD advisor is to advance my trainees’ career through direct engagement that facilitates guidance, and sharing experience and expertise. It is my goal in this advising statement to set clear expectations and responsibilities and help support their professional and career goals. In general, I will help foster a sense of professional responsibility and continuous professional development, assist in building a mentorship team, and ensure continual movement towards successful completion of the PhD degree.

Research Goals

- I expect my trainees to develop concrete short term and long term research goals as well as a timeframe for reaching these goals.
- I expect my trainees to submit and publish peer-reviewed first author publications.
- I expect my trainees to keep up with the literature. Generally, trainees should set aside time for reading the primary literature every day.
- I will read and respond to all work submitted to me in a timely manner, within the constraints of my other responsibilities. I will strive to return all materials at least within a week of submission to me.
- I expect my trainees to present their research findings at meetings at least once a year. I will help facilitate the presentation of your research at meetings, both internal and external, and I will work with you so that your presentations effectively communicate your research.

Graduate Stipend and Funding

- I have the primary responsibility to provide for adequate funding of both the research and stipend for my trainees.
- I expect my trainees to participate in the writing of grant proposals, including writing their own fellowship proposals

Meetings

- I will meet regularly with my trainees at a mutually agreed upon interval, and expect that trainees will also be available to meet with me. I recognize that this interval will vary with my trainee’s needs overall and at specific times during the course of training. This includes both regular meetings and informal conversations.
- I expect my trainees to participate in all laboratory group meetings, as well as the seminars and programs related specifically to my trainee’s research focus and graduate program.
- I expect my trainees to meet with their thesis committees at least annually, or as often as required by the chosen graduate program, and to participate in the required MSTP annual progress meetings.

Professionalism

- I expect my trainees to be a good laboratory citizen: help train new students, help maintain equipment, and ensure supplies that are jointly used are maintained.
• I expect my trainees to maintain an accurate and detailed laboratory notebook. This is the legal record of research, and belongs to the laboratory and university, not to the trainee or me. It is critical it be accurate and sufficiently detailed that every experiment could be replicated by another individual and get the same result.

• I expect my trainees to meet laboratory as well as program-related deadlines.

• I will set specific guidelines on work hours, sick leave, and vacation time, and these should be discussed and approved by me. I will help trainees recognize that the amount of time put into research will be directly reflected in the overall time to completion of the PhD.

• All of your professional correspondence should be conducted as if you are communicating with me, whether you are communicating with undergraduate researchers, laboratory and unit staff, or staff members and trainees in other labs or at other institutions.

• I expect my trainees to behave professionally and treat all others with respect. Anything else will not be tolerated.

• We must all contribute to creating an environment that is welcoming, inclusive and respectful for all. We must continually educate ourselves, examine our biases, and work to combat systemic racism and injustice. Any incidents of discrimination, bias or racism will be called out and should be reported to the Bias Response and Referral Network.

• Trainees should speak to me if there are concerns about interactions with other lab members. If there are concerns about interactions with me, please reach out to the graduate program DGS or other program leaders. The Student Conflict Resolution Center is a helpful resource.

Ethical Behavior

• I will maintain ethical standards in my research and scholarly work, including compliance with institutional and federal regulations for research, as well as issues of copyright.

• I expect my trainees to complete all required training and maintain ethical standards for their research and scholarly work.

Independence

• I will work with my trainees to help them become increasingly independent and increasingly responsible as they progress in their thesis research.

• I will be supportive, equitable, accessible, encouraging, and respectful. I expect my trainees to recognize that constructive criticism and feedback is intended to improve their work.

• I will be an advocate for my trainees during their tenure in my laboratory but also as they continue their specific career pathway.

Clinical Training

• I understand that MD/PhD trainees will be obtaining additional clinical training during their time in my lab.

• Where appropriate, I will work with my MD/PhD trainees to identify opportunities for integrating research and clinical interests.

Professional and Career Development
• I will support the professional development goals of my trainees, and work with them to help define what those will be and how to best achieve them.
• I recognize that we all need mentor teams. I will help my trainees identify and seek out external resources that will help them reach those goals if they are not part of the laboratory expertise or that of graduate program training.
• I expect my trainees to complete the annually required MSTP IDP Progress Report and use this as a tool to guide their professional development.

Personal Life and Wellness:
• There is more to life than work. I expect my trainees to take time for themselves, in order to ensure physical, psychological, and social well-being.
• Trainees should be aware of the mental health and wellness resources at UMN.

Timeline
• I expect my MD/PhD trainees to complete their PhD training in 4 years or less.
• I expect my trainees to have at least one first-authored, peer-reviewed research publication prior to completion of the PhD degree.
Multicultural Resources and Services

The Twin Cities Multicultural Directory serves to inform new and current students, staff, and faculty about resources and services within the Twin Cities area. You can view the directory by major category or the primary community served. The descriptions and contact information provided are from the original organization's website. Further information is available here.
# 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>
</tr>
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<tbody>
<tr>
<td>Adamala, Kate</td>
<td>Mahima Devarajan</td>
<td><a href="mailto:devar043@umn.edu">devar043@umn.edu</a></td>
</tr>
<tr>
<td>Aihara, Hideki</td>
<td>Michael Anderson</td>
<td><a href="mailto:and08240@umn.edu">and08240@umn.edu</a></td>
</tr>
<tr>
<td>Amin, Elizabeth</td>
<td>Erik Faber</td>
<td><a href="mailto:fabe053@umn.edu">fabe053@umn.edu</a></td>
</tr>
<tr>
<td>Araque, Alfonso</td>
<td>Michelle Corkrum*</td>
<td><a href="mailto:mcor068@umn.edu">mcor068@umn.edu</a></td>
</tr>
<tr>
<td>Ashe, Karen</td>
<td>Balvindar Singh, Ryan Nelson</td>
<td><a href="mailto:singh308@umn.edu">singh308@umn.edu</a>, <a href="mailto:nels5471@umn.edu">nels5471@umn.edu</a></td>
</tr>
<tr>
<td>Barocas, Victor</td>
<td>Caleb Vogt</td>
<td><a href="mailto:vogtx127@d.umn.edu">vogtx127@d.umn.edu</a></td>
</tr>
<tr>
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<tr>
<td>Adrine Kocharian*</td>
<td><a href="mailto:kocha048@umn.edu">kocha048@umn.edu</a></td>
<td></td>
</tr>
<tr>
<td>Rothwell, Patrick</td>
<td><a href="mailto:trieu016@umn.edu">trieu016@umn.edu</a>, <a href="mailto:bran0886@umn.edu">bran0886@umn.edu</a>, <a href="mailto:kocha048@umn.edu">kocha048@umn.edu</a></td>
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</tr>
<tr>
<td>Sadowsky, Mike</td>
<td><a href="mailto:wein0343@umn.edu">wein0343@umn.edu</a></td>
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<tr>
<td>Schwertfeger, Kaylee</td>
<td><a href="mailto:moham551@umn.edu">moham551@umn.edu</a></td>
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<tr>
<td>Searle, Kelly</td>
<td><a href="mailto:earla001@umn.edu">earla001@umn.edu</a></td>
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<tr>
<td>Seelig, Burckhard</td>
<td><a href="mailto:lane0380@umn.edu">lane0380@umn.edu</a></td>
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<tr>
<td>Shimizu, Yoji</td>
<td><a href="mailto:mahmu004@umn.edu">mahmu004@umn.edu</a>, <a href="mailto:chiux141@umn.edu">chiux141@umn.edu</a></td>
<td></td>
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<tr>
<td>Sivaramakrishnan, Sivaraj</td>
<td><a href="mailto:touma@umn.edu">touma@umn.edu</a></td>
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<tr>
<td>Siegfried, Jill</td>
<td><a href="mailto:velez044@umn.edu">velez044@umn.edu</a></td>
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</tr>
<tr>
<td>Simone, Don</td>
<td><a href="mailto:spel0048@umn.edu">spel0048@umn.edu</a>, <a href="mailto:wheel381@umn.edu">wheel381@umn.edu</a></td>
<td></td>
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<tr>
<td>Spector, Logan</td>
<td><a href="mailto:barks012@umn.edu">barks012@umn.edu</a></td>
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<tr>
<td>Spencer, Sade</td>
<td><a href="mailto:hern0345@umn.edu">hern0345@umn.edu</a></td>
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<tr>
<td>Stromnes, Ingunn</td>
<td><a href="mailto:patte880@umn.edu">patte880@umn.edu</a></td>
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<tr>
<td>Thomas, David</td>
<td><a href="mailto:goldb273@umn.edu">goldb273@umn.edu</a>, <a href="mailto:phung022@umn.edu">phung022@umn.edu</a>, <a href="mailto:touma@umn.edu">touma@umn.edu</a></td>
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<td>Thomas, Mark</td>
<td><a href="mailto:sweis001@umn.edu">sweis001@umn.edu</a>, <a href="mailto:trieu016@umn.edu">trieu016@umn.edu</a>, <a href="mailto:kocha048@umn.edu">kocha048@umn.edu</a>, <a href="mailto:lopez927@umn.edu">lopez927@umn.edu</a></td>
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<tr>
<td>Tolar, Jakub</td>
<td><a href="mailto:meie0158@umn.edu">meie0158@umn.edu</a>, <a href="mailto:jriedl@umn.edu">jriedl@umn.edu</a>, <a href="mailto:quent051@umn.edu">quent051@umn.edu</a></td>
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</tr>
<tr>
<td>Townsend, DeWayne</td>
<td><a href="mailto:yella007@umn.edu">yella007@umn.edu</a>, <a href="mailto:chiux141@umn.edu">chiux141@umn.edu</a></td>
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<tr>
<td>Tretyakova, Natalia</td>
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<tr>
<td>Vallera, Dan</td>
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<tr>
<td>van Berlo, Jop</td>
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<tr>
<td>Name</td>
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<td>Email</td>
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<tr>
<td>Venteicher, Andrew</td>
<td>Olivia Smith</td>
<td><a href="mailto:oliviacs@umn.edu">oliviacs@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>
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<tr>
<td>Vulchanova, Lucy</td>
<td>Anisha Adke</td>
<td><a href="mailto:adke0001@umn.edu">adke0001@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>Wickman, Kevin</td>
<td>Judit Perez Ortiz</td>
<td><a href="mailto:perez211@umn.edu">perez211@umn.edu</a></td>
</tr>
<tr>
<td>Widge, Alik</td>
<td>Edith Hernandez</td>
<td><a href="mailto:hern0345@umn.edu">hern0345@umn.edu</a></td>
</tr>
<tr>
<td>Williams, Jesse</td>
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<td><a href="mailto:patte880@umn.edu">patte880@umn.edu</a></td>
</tr>
<tr>
<td>Winkelman, Tyler</td>
<td>Riley Shearer</td>
<td><a href="mailto:shear162@umn.edu">shear162@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>Ziverstand, Anna</td>
<td>Andrea Maxwell</td>
<td><a href="mailto:maxwe277@umn.edu">maxwe277@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

| Required Courses   | A minimum of 12 credits is required:  
|                   | • One core course module (2 credits)  
|                   | • Student seminar (minimum one credit suggested: two semesters, one credit each = 2 credits)  
|                   | • Departmental seminar (minimum one credit suggested: two semesters, one credit each = 2 credits)  
|                   | • Ethics course (1 credit)  
|                   | • Critical thinking and experimental design (1 credit)  
|                   | • Grantwriting course (1 credit)  
|                   | • Elective coursework (3 credits)  
| Coursework should be planned in consultation with the PhD advisor and BMBB DGS upon entering the program | 
| Supporting Courses | • Maximum of 12 credits in order to meet the 24 credit minimum required by the Graduate School  
| Medical School coursework is used to fulfill supporting course requirement | 
| Written preliminary exam | Beginning of spring semester year 1  
| Oral preliminary exam | End of spring semester year 1  
| Teaching | One semester  

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

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Supporting Courses</th>
<th>Written preliminary exam</th>
<th>Oral preliminary exam</th>
<th>Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>• BMEn 8000-level core (6 credits)</td>
<td>• Technical Electives (9 credits)</td>
<td>Between Year 2 and Year 3 of the PhD phase</td>
<td>Between Year 2 and Year 3 of the PhD phase</td>
<td>One semester out of every two years</td>
</tr>
<tr>
<td>• BMEn 8601 and/or BMEn 8602 - Seminars (3 credits)</td>
<td>• Biology Electives (6 credits)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Free Science/Technical Electives (6 credits)</td>
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</tbody>
</table>

Must be chosen from the BMEn 8000-level course list
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.

Courses in engineering, physical sciences and mathematics
Medical School coursework can be used to fulfill the Biology Electives and the Free Science/Technical Electives

PhD requirements are on the [BME website](#).
Biomedical Informatics and Computational Biology (BICB) Graduate Program

Consult the BICB Student 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>
</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>
</tr>
<tr>
<td>• PUBH 8342 – Advanced Epidemiological Methods: Applications (3 credits)</td>
<td>• Both Tracks: 2 additional credits of content area coursework</td>
</tr>
<tr>
<td>• PUBH 7401 – Fundamentals of Biostatistical Inference (4 credits)</td>
<td>5 credits required for MSTP students instead of 13 credits</td>
</tr>
<tr>
<td>• PUBH 6348 – Writing Research Grants (2 credits)</td>
<td>In content area portion of both tracks, 2 credits (one course) are required instead of 4 credits</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>
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<td>OR</td>
<td></td>
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<tr>
<td>GRAD 8200 – Teaching and Learning Topics in Higher Education (1 credit)</td>
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<tr>
<td>• PUBH 7420 – Clinical Trials: Design, Implementation and Analysis (3 credits)</td>
<td></td>
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<tr>
<td>OR</td>
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<tr>
<td>PUBH 6363 – Design and Analysis of Group-Randomized Trials in Epidemiology (3 credits)</td>
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</table>

Supporting Courses

<table>
<thead>
<tr>
<th>Written preliminary exam</th>
<th></th>
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<tbody>
<tr>
<td>Part A: Comprehensive, 2-day written exam covering the fundamentals of epidemiology, biostatistics and the doctoral-level</td>
<td>5 credits required for MSTP students instead of 13 credits</td>
</tr>
</tbody>
</table>

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 Student Guidebook](#).
### Integrative Biology and Physiology (IBP) Graduate Program

#### Required Courses
- ANSC 5700 – Cell Physiology (4 credits)
- Biostatistics course (3 or 4 credits, see [IBP Handbook](#) for options)
- PHSL 5096 – Integrative Bio & Phys Advances (1 credit, taken fall year 1, spring year 1, and fall year 2)
- PHSL 8242 – Professional Skills Development for Biomedical Scientists (1 credit)
- PHSL 8232 – Critical Journal Reading (2 credits)
- PHSL 5101 – Medical Physiology (5 credits)

Medical School credits count for PHSL 5101

#### Supporting Courses
- 12 credits completed in the minor field or supporting program (non-PHSL credits)

Medical School coursework may be used to fulfill supporting course requirement

#### Written preliminary exam
Essay format test taken within 2 weeks of completion of spring semester year 1

#### Oral preliminary exam
Oral preliminary exam taken no later than end of fall semester of year 2

#### Teaching
None

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

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Supporting Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• MEDC 8001 – General Principles of Medicinal Chemistry (3 credits)</td>
<td>• Two elective courses from the Department of Medicinal Chemistry</td>
</tr>
<tr>
<td>• CHEM 8321 – Organic Synthesis (4 credits)</td>
<td>• One Biochemistry Course</td>
</tr>
<tr>
<td>• MEDC 8050 – Physical and Mechanistic Organic Chemistry (2 credits)</td>
<td>• One elective course from inside or outside the Department of Medicinal Chemistry</td>
</tr>
<tr>
<td>• MEDC 5495 – Vistas in Medicinal Chemistry Research (1 credit)</td>
<td>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</td>
</tr>
<tr>
<td>• MEDC 8002 – General Principles of Medicinal Chemistry (3 credits)</td>
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</tr>
<tr>
<td>• MEDC 8435 – Experimental Design and Statistics (1 credit)</td>
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<tr>
<td>• MEDC 8100 – Seminar (1 credit)</td>
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<tr>
<td>• MEDC 8800 – Lab rotation (1 credit)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Written preliminary exam</th>
<th>Oral preliminary exam</th>
<th>Teaching</th>
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</thead>
<tbody>
<tr>
<td>Generally the last Thursday and Friday in June at the end of year 1</td>
<td>Written proposal due July 1 and oral exam in July – August at the end of year 2</td>
<td>Not required, but contingent on RA funding from advisor</td>
</tr>
</tbody>
</table>

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

| Required Courses | • 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) |

| Supporting Courses | • 12 credits completed in the minor field or supporting program |
|                   | Medical School coursework may be used to fulfill supporting course requirement |

<table>
<thead>
<tr>
<th>Written preliminary exam</th>
<th>Due no later than April 1 of year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral preliminary exam</td>
<td>Scheduled and completed before the start of fall semester of year 2</td>
</tr>
<tr>
<td>Teaching</td>
<td>None</td>
</tr>
</tbody>
</table>

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

| Required Courses | • MCDG 8920 – Special Topics / Itasca Workshop (2 credits)  
|                  | • 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  
|                  | • Minimum of 3 additional credits (a minimum of one additional graduate class) graded A-F | Consult with the MCDB&G DGS to discuss specific MSTP curriculum plan |
| Supporting Courses | • Optional |
| Written preliminary exam | Fall of Year 2 of the PhD phase |
| Oral preliminary exam | Spring of Year 2 of the PhD phase |
| Teaching | One semester |

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.
## Graduate Program in Neuroscience (GPN)
*(effective fall 2020)*

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Supporting Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• NSc 5551 – Cell &amp; Molecular Neurobiology Lab at Itasca (4 credits)</td>
<td>• Not required</td>
</tr>
<tr>
<td>• NSc 5461 – Cellular &amp; Molecular Neuroscience (4 credits)</td>
<td></td>
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<tr>
<td>• NSc 5561 – Systems Neuroscience (4 credits)</td>
<td></td>
</tr>
<tr>
<td>• NSc 5661 – Behavioral Neuroscience (3 credits)</td>
<td></td>
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<tr>
<td>• NSc 8211 – Developmental Neurobiology (3 credits)</td>
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</tr>
<tr>
<td>• NSc 8321 – Career Skills – Understanding Responsibilities as a Neuroscientist</td>
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<tr>
<td>• NSc 8111 - Quantitative Neuroscience (Experimental Design, Neurostatistics, and Coding (3 credits)</td>
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</tr>
<tr>
<td>• Additional courses, not including statistics (6 credits)</td>
<td></td>
</tr>
<tr>
<td>Itasca begins late July before first year of PhD phase</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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Written preliminary exam</th>
<th>Oral preliminary exam</th>
<th>Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>In June after the completion of the first year of coursework</td>
<td>Written proposal due no later than January 2 of the second year of the PhD phase</td>
<td>One semester</td>
</tr>
<tr>
<td></td>
<td>Oral exam completed by January 20 of the second year of the PhD phase</td>
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<tr>
<td></td>
<td>Written research proposal and training plan in the form of a NIH F30 proposal</td>
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</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 (recommended but optional)
      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)
      2. Take NSC 8217 (Systems and Computational Neuroscience)
      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)
   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 8111 Quantitative Neuroscience
         a. Satisfies “Quantitative Requirement for MSTP Students”
      2. MSTP students are not required to enroll in the third semester of 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. 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

| Required Courses | • PHCL 5110 – Introduction to Pharmacology (3 credits)  
|                  | • PHCL 5112 – A Graduate Student Toolkit I: An Introduction to the Scientific Research Lab (1 credit)  
|                  | • PHCL 8200: Seminar: Selected Topics in Pharmacology (1 credit)  
|                  | • PHCL 8211 – Advanced Medical Pharmacology (5 credits)  
|                  | • PHCL 8212 – Advanced Medical Pharmacology II (3 credits)  
|                  | • PHCL 5113 – A Graduate Student Toolkit II: Scientific Speaking and Writing for Graduate Students (2 credits)  
|                  | PHCL 5110 is waived for MSTP students  
| Supporting Courses | • Optional (requires approval of the student’s advisor and Pharmacology DGS)  
| 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 October 29, 2020

Program Announcements and Notices

- **PA-21-049**: 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-21-051**: Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (Parent F31)
- **PA-21-052**: Ruth L. Kirschstein National Research Service Award Individual Predoctoral Fellowship to Promote Diversity in Health-Related Research (Parent F31 - Diversity)
- **NOT-OD-20-031**: NIH’s Interest in Diversity

Key Information

<p>| Program Announcement: |
|----------------------|---|
| Name:                |
| Commons User ID:     |
| ORCiD iD             |
| UMN Departmental/Program Grants Administrator: |
| • E-mail address     |
| • Phone              |
| Sponsor (i.e., PhD advisor): |
| Sponsor Commons User ID |
| Co-Sponsor(s) (if any): |
| Co-Sponsor Commons User ID |
| Consultants/Collaborators/F-Advisory Committee members: |
| Recommendation #1:   |
| Recommendation #2:   |
| Recommendation #3:   |
| Recommendation #4:   |</p>
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<tr>
<td>UMN Financial Conflict of Interest (FCOI) training date</td>
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<td>UMN Responsible Conduct of Research core curriculum completion date (required prior to award set up)</td>
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<td>US citizen or permanent resident?</td>
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<td>Previous NRSA support?</td>
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<td>Veteran’s Administration facilities to be used?</td>
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<td>International work or travel or collaboration planned?</td>
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<tr>
<td>Final NIH Institute:</td>
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<tr>
<td>NIH Program Officer:</td>
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<td>• E-mail address</td>
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**Key Resources**

- [SF424 Guide – Version F](#) (Released March 2, 2020)
  - Official instructions for preparing the application
  - Changes in Version F
    - Added instructions about rigor, experimental design, and quantitative approaches to the “Training Goals and Objectives” section of the “Applicant’s Background and Goals for Fellowship Training” attachment.
    - “Identify the skills, theories, conceptual approaches, etc., to be learned or enhanced during the award, including, as applicable, expertise in rigorous...”
research design, experimental methods, quantitative approaches, and data analysis and interpretation, as applicable.”

- Added instructions for the “Authentication of Key Biological and/or Chemical Resources” field.
  - “If applicable to the proposed science, briefly describe methods to ensure the identity and validity of key biological and/or chemical resources used in the proposed studies.”
- Added new “Description of Candidate’s Contribution to Program Goals” attachment.
  - For diversity-related F31 applications only

- Sponsor/Co-Sponsor Statement
  - “The Sponsor should also describe the roles and responsibilities that both he/she and the fellow are undertaking, including contributions to the research plan, the portion of the research ideas and plan that originated with the candidate, and the relationship between the proposed research plan and funded or unfunded research projects previously devised by the sponsor.”

- 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, Jelenchick, Barks, Breed, Phung, Lee, Wijeyesinghe, Perez Kerkvliet, Faber, Touma, Chiu, Garay, Sierra-Pagan, Wanhainen, Trieu, Brandner, and Gavil 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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**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-21-052 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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<td>How can I improve my presentation skills?</td>
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<td>Am I increasing the depth and breadth of my knowledge by attending seminars within and outside of my field?</td>
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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?

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<td>What BARRIERS might you face when working toward your goal? Include resources needed to overcome these barriers</td>
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<tr>
<td>How will you MEASURE your progress?</td>
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<tr>
<td>What ACTIONS will you take toward achieving your goal? Include how mentors might help you achieve your goal.</td>
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</table>
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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<tr>
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<th>Career Goals</th>
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<tr>
<td><strong>What are my short-term career goals? How will I achieve these goals within the next two to five years?</strong></td>
</tr>
<tr>
<td><strong>What are my long-term career goals? How will I achieve these goals within the next 10 to 15 years?</strong></td>
</tr>
<tr>
<td><strong>Am I thinking ahead about my next career stage having evaluated my strengths, weaknesses, and passions?</strong></td>
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</table>

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](#).

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<tr>
<th>Specialty</th>
<th>Mentor</th>
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<tr>
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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). Students will be registered in the Fall semester, receive a grade of “K”, and continue the course in the Spring semester. A final grade will be assigned at the end of Spring semester.

Clinical Continuity 1
- 2\textsuperscript{nd} year of graduate phase
- 16 half-day clinics over 9 months (2 virtual patient visits = 1 half-day)
- Students function as 3\textsuperscript{rd}-year medical student on clinical rotation
- MSTP Grand Rounds presentation (see MSTP Program Handbook for details)

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 Program Handbook for details)

All students are expected to attend MSTP Grand Rounds.

See separate page regarding Registration and Grading.

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 3\textsuperscript{rd} 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.

PRACTICAL SUGGESTIONS FOR CLINICAL CONTINUITY

The mentor should cover the following topics with the student on or before the first day of clinic:

1. Identify 16 half-days that the student will attend clinic during the academic year. The academic year ends in mid-May. [Link to academic calendar.]

2. Discuss how (email, text, phone, Epic message) and how far in advance the student should communicate with the mentor if the student is unable to attend a scheduled clinic and how a make-up clinic will be scheduled.

3. Discuss what preparation the student should do before each clinic (e.g. reviewing charts in Epic). Show the student how to find your clinic schedule in Epic.

4. Discuss when the student should show up for clinic (e.g. 15 minutes before first scheduled patient).

5. Discuss what the student will do during clinical encounters. Gradually increasing independence is suggested.

6. Discuss expectations for clinical notes or other documentation and how/when you will review the notes with the student. If you use templated notes, share the template(s) with the student via Epic.

7. Discuss appropriate attire for clinic.

8. Introduce the student to other people in the clinic (MDs, RNs, PAs, NPs, MAs, etc.).

9. Discuss and view the online evaluation system (each student has a link to the system). Remind the student to choose a domain to be evaluated each clinic. Discuss when you will complete the evaluations with the student; ideally, complete the evaluation together at the end of each clinic.

10. Halfway through the course, review these suggestions and discuss any modifications that need to be made to improve the experience for both student and mentor.
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 follows the University of Minnesota academic calendar.

Clinical Foundations
- Final year of graduate phase
- 18 half-day clinics (2 virtual patient visits = 1 half-day)
  - Students will be registered in the Fall semester, receive a grade of “K”, and continue the course in the Spring semester. A final grade will be assigned at the end of 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 (see below for details)

All students are expected to attend MSTP Grand Rounds.

See separate page regarding Registration and Grading.

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. The Proposal should include the following:

1. Description of the clinical area for improvement.
2. Quantification metrics at baseline and post-intervention.
3. Suggested QI intervention and QI approach being used (e.g. P.D.S.A. cycle)
4. Strategy to achieve “buy-in” from people affected by QI intervention

The QI Project Proposal should be reviewed with the mentor, then emailed to Dr. Binstadt and Susan Shurson.

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.

**PRACTICAL SUGGESTIONS FOR CLINICAL FOUNDATIONS**

The mentor should cover the following topics with the student on or before the first day of clinic:

1. Identify 18 half-days that the student will attend clinic during the academic year. The academic year ends in mid-May. [Link](#) to academic calendar.

2. Discuss how (email, text, phone, Epic message) and how far in advance the student should communicate with the mentor if the student is unable to attend a scheduled clinic and how a make-up clinic will be scheduled.

3. Discuss what preparation the student should do before each clinic (e.g. reviewing charts in Epic). Show the student how to find your clinic schedule in Epic.

4. Discuss when the student should show up for clinic (e.g. 15 minutes before first scheduled patient).

5. Discuss what the student will do during clinical encounters. Gradually increasing independence is suggested.

6. Discuss expectations for clinical notes or other documentation and how/when you will review the notes with the student. If you use templated notes, share the template(s) with the student via Epic.

7. Discuss appropriate attire for clinic.

8. Introduce the student to other people in the clinic (MDs, RNs, PAs, NPs, MAs, etc.).

9. Discuss and view the online evaluation system (each student has a link to the system). Remind the student to choose a domain to be evaluated each clinic. Discuss when you will complete the evaluations with the student; ideally, complete the evaluation together at the end of each clinic.

10. Halfway through the course, review these suggestions and discuss any modifications that need to be made to improve the experience for both student and mentor.
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.
MSTP Clinical Continuity and Clinical Foundations

Clinical Continuity and Clinical Foundations Registration and Grading

Registration
1. You must inform Susan Shurson by email that you want to register for CC or CF at least two weeks before the semester starts.
2. The drop deadline is the Friday of the first week of the semester. If you Withdraw after the Friday of the first week of the semester, you will receive a W on your transcript. The W cannot be removed from your transcript.

Number of Clinical Sessions to Complete Course
CC1 and CC2: 16 half-day clinics in one academic year (Sept – May)
CF: 18 half-day clinic sessions in one academic year (Sept – May)

(2 virtual patient visits = 1 half-day)

Associated Activities
CC 1: Present MSTP Grand Rounds
CC 2: Prepare Specific Aims Page
CF: Complete online Quality Improvement Course and prepare QI Project Proposal (1 page).

Written Associated Activities for CC2 and CF should be emailed to Dr. Binstadt and to Susan Shurson before the end of the course.

Grading Criteria
Honors (H):
- Attend all expected clinical sessions
  - Complete online evaluation for all clinical sessions
- No unexcused absences from MSTP Grand Rounds
- Complete Associated Activity

Excellent (E):
- Attend all expected clinical sessions
  - Complete online evaluation for all clinical sessions
- No more than one unexcused absence from MSTP Grand Rounds
- Complete Associated Activity

Satisfactory (S):
- Attend at least 80% of expected clinical sessions
  - Complete online evaluation for all clinical sessions attended
- No more than two unexcused absences from MSTP Grand Rounds
- Complete Associated Activity

Incomplete (I):
- Attend at least 50% of expected clinical sessions
  - Complete online evaluation for all clinical sessions attended
- Three or more unexcused absences from MSTP Grand Rounds. If this occurs, you must remediate the absences by attending additional MSTP Grand Rounds the following academic year.
- Incomplete Associated Activity. This must be remediated by completing the Associated Activity.
- The “I” will be removed from your transcript only if you complete the course requirements in the semester following the one in which you registered. The highest grade that you can receive in this circumstance is “S”.

No Pass (N):
• Students who do not meet the requirements for one of the above grades will receive a grade of **No Pass (N)**, equal to Fail. The N cannot be removed from the transcript. For an absence to be excused, the student must notify the course director at least one week in advance of the Grand Rounds that will be missed (except in the case of emergencies). The course director has discretion to determine if an absence is excused or not. Examples of excusable absences include attendance at conferences, previously-planned trips, etc.
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
Advise for Personal Statement for Residency Applications
Medical Scientist Training Program
University of Minnesota

Use the personal statement to describe who you are, how you decided on this clinical field, what you have done, and what you want to do.

This is different from the personal statement(s) you wrote to get into the MSTP. There’s only one statement, so it needs to touch on both clinical and research aspects. And you and all the other applicants are already well on the way to becoming doctors, so don’t go overboard describing how you want to help people. Of course you want to help people.

The fact that you are an MD/PhD student is not immediately obvious from the ERAS application. Be sure it is obvious in your personal statement. Do not, however, use the personal statement to describe how many first-author papers you have or awards you have won -- that info appears elsewhere in the application, especially your letters of recommendation. Leave your horn tooting to others.

Describe your thesis research project, but know that your audience is residency program directors, not (typically) researchers. A few sentences about the research is fine, and if you can highlight its clinical impact that’s great. In addition, describe what you have learned about yourself and/or how you have grown during the MD/PhD program -- demonstrating self-reflection is key. Also, demonstrating gratitude to folks who have helped you during this phase is nice (PhD mentors or other).

Most importantly, describe your career goals and how you plan to incorporate research into your career. This is a chance to demonstrate again how your area of research interest/expertise sets you up well for a career in your chosen field.
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 Career Support**

- **Boreas Leadership Certificate**

- **Center for Writing**

- **Center for Educational Innovation**

- **Clinical and Translational Science Institute**

- **MICaB Career Development Program**

- **Lasker Lessons in Leadership**

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

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

- **James Ryan: Lead with Grace**

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

- **Personal Success Factors: Strengths Test Sites**

- **iBiology: Planning Your Scientific Journey**

- **Ten steps to overcome imposter syndrome**

- **The core traits of career success**

- **The Road to Resilience**

- **Personal Finance for PhDs**

- **NIH Office of Intramural Training and Education (OITE)**

- **Unconscious Gender Bias and its Impact on Imposter Syndrome in Women**
Online Resources: The Graduate Phase

- 20 things I wish I’d known when I started my PhD
- Mastering your PhD: starting off on the right foot
- iBiology: Planning Your Scientific Journey (online self-paced course)
- iBiology: Let’s Experiment: A Guide for Scientists Working at the Bench (online self-paced course)
- How to Be a Graduate Advisee
- Managing Your Advisor
- How to Choose a Good Scientific Problem
- 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. Click the “Activate My Membership” button to claim your membership.

- Lab head should learn to talk about racism
- Advising Across Race: Providing CulturallySensitive Academic Advising at Predominantly White Institutions
- Inclusive Advising
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
  - Introduction to the Specific Aims Page of a Grant Proposal
- Video: Making Scientific Writing Painless
  - The Baldwin formula for scientific writing: writing papers and reviews
- How to write a scientific masterpiece: an update for 2019
- 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
- Simple Rules for Concise Scientific Writing
- Writing in the Sciences: free online course
Online Resources: Communication

- How to create a better research poster in less time
- Scientific presentations: a cheat sheet
- Designing effective scientific presentations
- Oral presentations: using slides effectively
- TED Talk: Talk Nerdy to Me
- TED Talk: How to speak so that people want to listen
- 3 Minute Thesis (3MT) Competition
- How to Give a Great Chalk Talk
- How to Give a Chalk Talk
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

- 28 Questions I Wish I Had Asked When Selecting My PhD Advisor

- Student Conflict Resolution Center

- Student Conflict Resolution Center Resources: The Dignity Project

- Learning to be a mentor: working with undergraduate researchers

- Mentoring Action Plan

- Mentoring map

- NCFDD mentoring map

- Mentoring Hats

- Ten Simple Rules for Building an Antiracist Lab

- Ten Simple Rules towards Healthier Research Labs

- The Art of Scholarly Mentoring

- The Science of Mentorship Podcast
Online Resources: Clinical Training

- Medical School Clinical Specialty Experts
Online Resources: Anti-Racism

- Anti-racism in medicine collection (AAMC)
- Race and Medicine (NEJM)
- Anti-racism resources for higher ed (Center for Educational Innovation)
- Race Matters, David Asai
- Documentary: Jim Crow of the North
- Battling ‘Minnesota Nice’, Structural Racism And White Privilege
- ShutDownSTEM
- Anti-racism resources
- Justice in June
- Becoming Anti-racist, Angeline Dukes, Elena Dominguez, Autumn Ivy
- For Black Scientists, the Sorrow is also Personal, Kafui Dzirasa
- Being Antiracist, National Museum of African American History and Culture
- Talks to help you understand racism in America
- Faculty Fighting Racism, University of Minnesota Graduate School and Graduate School Diversity Office
- Academics for Black Survival and Wellness
- How to deconstruct racism, one headline at a time
- The diversity-innovation paradox in science
- NRMN Unconscious Bias Course
- Responses to 10 Common Criticisms of Anti-Racism Action in STEM
- Health and Human Rights in a Time of Crisis Digital Series
- Bhalla Lab Equity Reading List
- Ten Simple Rules for Building an Antiracist Lab
- How to better support Black trainees in the biomedical sciences
- 1,000 inspiring Black scientists in America
• **Conducting research through an anti-racism lens**

• **Misrepresenting Race - The Role of Medical Schools in Propagating Physician Bias**