



SCHOOL OF MEDICINE

Medical Scientist Training Program

UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

Student Handbook

2019 - 2020

Updated September 2019

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Expectations of MST Program Students

The key expectation of each student admitted into the CU Anschutz Medical Campus Medical Scientist Training Program is that they take full advantage of all CU Anschutz resources and couple that with personal responsibility to achieve optimal success. This Handbook details the Program REQUIREMENTS. During the first two years of combined medical and graduate school training, there are clear and tangible academic and research milestones every MST Program student must meet. In the first two years, it is expected that students will obtain passing grades in their coursework, successfully complete two research rotations, and pass the MSTP Graduate Preliminary exam and USMLE Step I exam. In the third year, students should begin thesis research and successfully pass the Comprehensive Exam. During this year, students will organize the National M.D./Ph.D. Student Conference. In the subsequent years of thesis research, the milestones become less clear and success relies on a student's own self-motivation, intellectual drive and hard work. Graduate school is not a job – it is training for a challenging career. Throughout the years of thesis work, MSTPs are required to register for the Longitudinal Foundations of Doctoring course in 2 out of the 3 terms (Fall, Spring, or Summer*). A student's success at this stage of training and in subsequent steps will depend on the student's own drive, initiative, and effort. The Thesis Advisor and Committee are in place to provide scientific and professional guidance and support. It is the student's responsibility to utilize his/her Thesis Advisor and Committee to lead a successful graduate experience and career. Ultimately, the student determines his/her success!

*Students in their thesis years on the Boulder campus must do their FOD course in the Fall and Spring only.

Expectations for Ph.D. Training

The MST Program has the following expectations for a student's thesis career,

1. A student should be self-motivated. Motivation should come from within and not be determined by the mentor or arbitrary deadlines.
2. A student should work the necessary hours in the lab to complete his/her experiments. Graduate school is not a five-day a week, 9-5 job. The effort that students put in will be reflected in their success and the timetable for their graduation.
3. A student should be intellectually engaged in their research project. The mentor often initially conceives the project. However, by the Comprehensive Exam, the student should be actively participating in experimental decisions and research directions. In subsequent years, the student should take progressively more control in the execution and direction of their research. Conversely, a student may design his or her own project and have it critiqued and approved by the advisor.
4. A student must take initiative for his/her career and be accountable for successes and failures in research. If things are not working in the lab, the student should coordinate with the advisor to find a solution. The Thesis Advisor and Committee exist to help students, but students must be proactive.

Expectations for Clinical Training

The MST Program has the following expectations for a student's clinical training.

1. A student should master taking a clinical history, performing a physical exam, and sharpening clinical skills.
2. A student should have working knowledge of all of the clinical data for the patients in his/her care and contribute to the differential diagnosis and management plan.
3. A student should maintain professional behavior at all times. Professionalism includes, but is not limited to, working as part of the team, contributing to all aspects of patient care, and becoming familiar with the current and relevant clinical literature.

Expectations for Professionalism

The Medical Scientist Training Program has the following general expectations for an MSTP student:

1. A student must respond to emails from MSTP, the SOM, the Graduate School, Graduate Programs and mentor(s) in a timely manner (within 4 hrs if urgent and within 24 hrs if not urgent).
2. A student must notify the MSTP and SOM if they travel for any personal reason and expect to be away during class time; and notify MSTP and their PhD mentor if they travel during the research period.
3. Professional behavior is expected at all times. Self-reflection to assess whether the student is behaving in the most appropriate and professional manner will be expected.

Over the past decade, many medical and graduate school curricula have dealt with issues related to student professionalism. We expect that MST Program students will maintain the highest standards of professionalism throughout their training and career years. Failure to meet these expectations can lead to dismissal from MSTP.

What do we mean by the term "[professionalism](#)"? We expect students to demonstrate:

- *honor and integrity*: being honest and answering questions truthfully
- *excellence and scholarship*: reading papers related to clinical situations while doing clerkships
- *respect*: across the board - of patients, other health care professionals, instructors, other students, and members of a research team
- *leadership*: mentoring those that can benefit from your knowledge and organizing a team or group with which you work; insight
- *accountability*: strong work ethic; timeliness; responding in a timely manner to e-mails sent by administration, advisors, instructors; commitment; dedication; legal/policy compliance
- *responsibility*: motivation; self-evaluation; independence; take the initiative to communicate regularly with faculty advisors, especially in matters related to research and progress within the graduate program
- *caring and compassion*: communication; sensitivity; tolerance; openness
- *altruism*: helping others who are busy; participation in student or school organizations

General Information

Welcome to the Medical Scientist Training Program

At the University of Colorado School of Medicine and Graduate School, the MST Program targets highly motivated students interested in a career in academic medicine. The successful student receives both the M.D. and Ph.D. degrees at the completion of the curriculum. During the first two years, the students take a combined medical and graduate school basic science curriculum designed to provide the scientific basis necessary both to biomedical research and medical practice. Students rotate through at least two research laboratories to obtain substantive research experience prior to the choice of a laboratory for thesis work. During the subsequent two to four years, the students enter a graduate program in one of the basic science departments fulfilling the requirements for the Ph.D., including successful defense of a dissertation and publication of at least two papers in peer reviewed journals. In the last portion of the program, the students return to the medical school curriculum to complete their clinical training.

Program Direction

The Director of the MST Program is Arthur Gutierrez-Hartmann, M.D., Professor of Medicine and of Biochemistry and Molecular Genetics. He is assisted by Associate Directors, Dr. Cara Wilson and Dr. Patricia Ernst and by members of the MST Program Steering and Executive Committees. In addition, there are two student representatives through the MSTP-Student Council. The co-presidents of the academic year are invited to monthly Executive Committee Meetings. The program's subcommittees and their current chairs are:

Student Advisory:	Arthur Gutierrez-Hartmann, M.D. Patricia Ernst, Ph.D. *pre-clinical years
Clinical Transition:	Unfilled effective 8/1/2019
Faculty Credentials:	Lee Niswander, Ph.D.
Seminar/Evaluation:	Patricia Ernst, Ph.D.
Admissions Committee:	David Port, Ph.D.
MD/PhD Student Conference:	All 3rd year MST Program students and selected faculty advisor

Program Information

Medical Scientist Training Program (MSTP)

University of Colorado Anschutz Medical Campus
13001 E. 17th Place, Room W5119
Fitzsimons Building, Mail Stop C296
Aurora, CO 80045

mstp@cuanschutz.edu

T (303)724-4600

Dr. Arthur Gutierrez Hartmann, Director

a.gutierrez-hartmann@cuanschutz.edu

Dr. Patricia Ernst, Associate Director, Pre-Clinical Years

patricia.ernst@cuanschutz.edu

Dr. Cara Wilson, Associate Director, Clinical Years

Cara.ernst@cuanschutz.edu

Liz Bowen, Administrator

elizabeth.bowen@cuanschutz.edu

Ruhyah Issah, Administrative Assistant

ruhyah.issah@cuanschutz.edu

Program Faculty

For a complete list of all current MST Program training faculty please visit our [Faculty Website Page](#).

New Student Information

The successful applicant to the MST Program enters the University of Colorado with dual status as a medical and a graduate student. The School of Medicine (SOM) Admissions Office handles all of the necessary paperwork for admittance to the School of Medicine and plans an orientation week before the MSI fall semester. This SOM Orientation is REQUIRED. Throughout the summer, students will receive several communications regarding Student Orientation Week. Please notify the School of Medicine of any postal or email address change to avoid a delay in receiving this important information.

The application to the MST Program serves as Part I of the application process to the Graduate School. The Graduate School Application Part II is processed by the MST Program Administrator. Eligibility for admission to the Graduate School cannot be approved without the submission of the following:

- Official Transcript from each College/University attended. Transcripts are not shared between the SOM and Graduate School
- Final Transcript from degree-granting institution documenting receipt of the undergraduate

degree

- Tuition Classification for Colorado Residency. You will submit a form for both the SOM and GS

Email Communications

All communication relating to MSTP, Graduate School, School of Medicine, Faculty, and Staff must be with a “cuanschutz.edu” email address; personal accounts such as gmail or yahoo should not be used. Students on the Boulder campus during their thesis years may use the “colorado.edu” as a secondary email address, but emails coming from Anschutz Medical Campus will be sent to their “cuanschutz.edu” email first.

A student must respond to emails from MSTP, the SOM, the Graduate School, Graduate Programs and mentor(s) in a timely manner (within 4 hrs if urgent and within 24 hrs if not urgent).

New-Student Paperwork: Payroll

Before students can receive their stipend, they must fill out the appropriate paperwork with the MST Program. The Program Administrator will ask for original passport, or driver’s license and social security card for hiring purposes. Students will fill out a W4 through their CU-Student Access Portal.

Stipend will be paid monthly on the last working day of the month (or as deemed by the State of Colorado). **T32 Trainees: Appropriate taxes will NOT be withheld from student’s pay. It is the STUDENT’S responsibility to pay their taxes via quarterly projected withholdings.**

The MSTP Office does not give out tax advice. Students should consult with a tax professional and the [IRS website](#).

New-Student Orientation

Shortly prior to the start of the fall semester, an orientation is scheduled to bring the new MST Program students together with key faculty and MST Program personnel. Representatives from the Medical and Graduate Schools are present to outline requirements and answer any questions. Students receive an orientation packet containing specific programmatic information and other forms.

Financial Support

Accepted students receive full funding, including a stipend (currently \$31,000/year, as of July 2019), tuition, health and dental insurance, and fees for the entire period of study. The MST Program provides the financial support during the students’ medical school program years and the PI/thesis mentor and/or graduate program provides support during the students’ thesis years. Continued support is contingent upon satisfactory academic, research, and professional performance by the student. *Deficient performance in any one of these areas can be grounds for dismissal from the MST Program or graduate program in which they are completing their PhD work, and result in termination of financial support (i.e., payment of tuition, fees and stipend) provided by the MST Program or by the PI/mentor.*

When a student enters a thesis lab, the thesis mentor assumes complete responsibility for the student’s stipend, tuition, fees and associated research costs. The Program strongly encourages students to apply for fellowship support during the research years. Please refer to the Appendix for agencies that support M.D./Ph.D. students. The student returns to MST Program support upon defending a thesis and returning to medical school, unless other funds have been obtained.

Students who transfer to The University of Colorado Boulder or National Jewish Health for their Ph.D. should check with their Ph.D. Program for details regarding their financial support.

These programs may vary slightly in their financial support and supporting medical insurance compared to what is provided on the Anschutz Medical Campus.

Qualification for financial aid may be affected for students assigned to the MSTP NIH T32, an F30 or F31 slots. Check with the MSTP office for details of transferring to Boulder.

Student Health Insurance

All students are required to be covered by health and dental insurance. Students will be automatically signed up for the University Student Health Insurance Program when registered for a minimum of 5 credit hours, unless they have alternate health insurance in place and specifically waive the University plan. Before the fall and spring semesters, students will need to fill out a waiver form through the [Office of Student Health Promotion](#), and follow the office's deadlines. Students must notify the MST Program Office if he/she plans to waive the student insurance. For more information on the plan and what it covers, contact Student Health Services at (303) 724-7674 or by email at: CUAnschutzStudentInsurance@cuanschutz.edu. **As previously listed, coverage of medical insurance differs at CU-Boulder.**

ID Cards/Badge Access

Students will receive a University ID Card as part of the Medical School orientation. Students will need this card for library privileges, parking lot access, and academic/medical school/hospital building access afterhours and weekends. CU Anschutz ID cards are issued for no longer than four years. Students will need to have their ID card re-activated by the end of the second year of graduate studies as well as students returning to the Anschutz Campus after completing their Ph.D. at CU Boulder. Separate ID cards for partner facilities (VA, NJ Health, UCH, CCH, CU Boulder) may also be required. See the MSTP office if you require a badge during thesis years.

Tuition Bills

The MST Program Administrator will pay tuition bills at the beginning of each semester for students in their medical years. That tuition bill will reflect charges for the core courses for which students are pre-registered. It is the student's responsibility to notify the Administrator if a course has been added or dropped during the add/drop period and to return any refund checks from the Bursar's Office to the MST Program Office. Check with the PhD Program Administrator regarding tuition bills during thesis years.

Parking

Students intending to drive to the Anschutz Medical Campus must contact the Parking Office at (303) 724-1584 or their website [HERE](#) to find out where parking is available. The Parking Office is located on the first floor in the Fitzsimons Building (aka: Building 500), across from the Office of Student Life. There is a monthly fee for parking during normal working hours (M - F, 8AM - 6PM). However, there is a Free Permit Parking for students, faculty, and staff after hours and weekends only. There is no charge to park in the gated permit parking lots Monday-Friday, 6:00pm to 6:00am or all day on Saturday and Sunday. Access in or out of the lot will be denied outside of this timeframe. Those still in the lot after 6:00am will be required to pay the hourly parking rate upon exit. A one-time \$10.00

activation applied. To sign up for the after-hours and weekend parking please visit the Parking Office in the Fitzsimons Building. MSTP, and your Anschutz PhD Programs pay for an RTD bus pass while registered as a full-time student. The Parking Office also offers keys for the locked bike storage area.

Establishing Colorado Residency

All out-of-state students are required to petition for In-State Tuition Classification. It takes one year to establish Colorado residency. This process is outlined in a handout entitled "How to Establish Domicile for Tuition Purposes" and found on the Office of the Registrar's website [HERE](#). Students need to read this information carefully so that they understand the process. The MST Program will pay out-of-state tuition during the first year ONLY. Each student must begin to establish residency IMMEDIATELY upon his or her arrival in Colorado.

1. Register the student's automobile with the State of Colorado
2. Obtain a State of Colorado driver's license (even if you don't have a car)
3. Register to vote (even if you don't plan to vote)
4. Obtain a lease agreement or proof of homeownership with the student's name on the document

The petition form can be found [HERE](#).

The **deadline** for submitting a complete residency petition for review is the first day of the term you are petitioning. *Submit earlier, if possible. One year after your driver's license was issued.*

Any student failing to meet the residency deadline will be personally responsible for the difference between in-state and out-of-state tuition rates.

Questions about residency should be directed to the Registrar's Office.

Office of the Registrar
University of Colorado | Anschutz Medical Campus
Campus Box A-054, Education II North
13120 E. 19th Avenue, Room 3205
Aurora, CO 80045
Email: CUAnschutzTCO.Registrar@cuanschutz.edu
Voice: 303-724-8054
Fax: 303-724-8060

Change of Address

To change one's address go to the student portal via <https://passport.ucdenver.edu/login.php>

Student Assistance

The MST Program and the School of Medicine have tutoring services available. Any student having difficulties in their classes should contact the MST Program Office immediately. With approval from the Director or Associate Directors, the MST Program will assist with tutoring fees and will help pay for additional preparatory courses. Please seek help early, as course remediation can delay student progression through an already tight timetable.

Publications and Acknowledgments

All student publications, including abstracts, journal articles and theses, should acknowledge the MST Program along with other university acknowledgments. Students supported on the MST Program training grant should acknowledge the grant number in all publications (MSTP T32 GM008497).

The MST Program Office has copies of all student theses. Students need to provide one bound copy of the final version of their thesis to the MST Program at the same time they turn it in to their Graduate Program. The MST Program will reimburse (students with itemized receipts) for the Program's copy.

Participation in Recruitment Functions

Between November and March of each year, prospective student applicants visit the CU Anschutz MST Program for interviews. It is in the Program's best interest to attract and retain the best of these prospective students. To do this CU Anschutz needs the help of all current students. When asked, students need to be willing to spend some time with the applicants and assist the Program Administrator with the various duties associated with recruitment. Students' efforts will pay dividends by generating a vital, outstanding Program.

Annual M.D./Ph.D. National Student Conference

CU Anschutz MST Program students organize the Annual National MD/PhD Student Conference during their first laboratory year (typically a student's third year in the MST Program). A student transferring into the CU MSTP from either another MD/PhD or MST Program or from the SOM MSII year will consult with MSTP leadership to decide the optimal year to participate in organizing this conference. The MST Program covers registration and meeting costs for CU Anschutz MST Program students. However, once CU Anschutz students register for the Conference, they are required to attend, as expenses cannot be refunded. If an emergency occurs, it is important to notify the Administrator and Director or Associate Directors as soon as possible.

We expect all incoming CU Anschutz MST Program students to attend the conference. In addition, MST Program students must attend a minimum of two conferences between the summer before MSI, summer after MSI, and summer after MSII. CU Anschutz MST Program students in their thesis or clinical years are required to present an abstract (oral or poster) in order to attend. In the event of extenuating circumstances that may conflict with these requirements, MST Program students should discuss their situation with the Director or Associate Directors as soon as possible to obtain a formal exception to the requirements stated above.

Students who attend are expected to stay the entire length of the conference. If you need to leave early, this needs prior approval from the Director and/or the Administrator.

Vacations

Students may schedule one-week vacation during the summer. An optimal time for an MSI/II student to take the vacation is before or after the laboratory rotation and/or before re-entry into their academic year. Students need to discuss vacation plans with their rotation/laboratory mentor. Students **MUST** let the MST Program know of their plans.

MSI students receive a week-long winter break vacation after Clinical Interlude. MSI/MSII students also receive a one-week spring break vacation in March along with the Medical Students. Depending on the student's choice of spring elective, **the medical and graduate school schedules may not coincide with spring break**. It is the student's responsibility to check this in advance and make appropriate plans.

MSTP Travel Funds

There is a limited amount of travel funds available to MSTP students to travel to conferences. If you seek travel assistance from MSTP, you will be asked to also seek out funds from other resources (e.g. SOM, Graduate School, PI). MSTP will consider matching the funds from other resources, up to \$500.

To be considered for MSTP Travel Funds, you must email the MSTP Program Administrator with detailed information regarding the conference – when, where, will you be presenting (required to give a talk and/or poster), and the cost breakdown of the conference (registration fees, lodging, etc.).

Office Resources Available to MST Program Students

Books, Test Prep Materials and MST Program Student Theses (Available in the MSTP office)

Color Printer (MST Program Office)

Mail Box in MST Program Office (Campus Box C296)

Black and White Copier

Mental Health Resources Available to MST Program Students

Campus Mental Health Services—

<http://www.ucdenver.edu/life/services/student-health/mental-wellness/Pages/default.aspx>

RAVE Campus Emergency Notification Service—

<http://www.ucdenver.edu/about/departments/UniversityPolice/EmergencyPreparedness/EmergencyNotificationSystem/Pages/UniversityEmergencyNotificationSystemRAVE.aspx>

CARE – Campus Assessment, Response & Evaluation Team (303) 315-7306;

shareaconcern@ucdenver.edu – <http://www.ucdenver.edu/life/services/CARE/Pages/default.aspx>

Refer to the Graduate School Handbook for a full list of services

Curriculum

The typical student enters the MST Program in August, although a research rotation may be taken the summer prior to matriculation. The first two years are devoted to a combination of graduate and medical school basic science courses. The Graduate School Core Course gives students a unified presentation of fundamental principles of biochemistry, cell biology, genetics and molecular biology. First-year students are registered for each of the sections of the Core course taught during the fall semester. Each student then chooses a graduate elective in the spring semester.

All entering medical/MST Program students are paired with a clinical Foundations preceptor and spends one afternoon per week during the first two years at the preceptor's site of practice. Students will be given a preceptor request form to survey their interests and logistical restraints. We encourage students to complete and return this form quickly to ensure the most appropriate match from a pool of preceptors. Conversely, students may arrange their own preceptors with the approval of the SOM Foundations of Doctoring office. The Foundations of Doctoring Course continues during a student's Thesis Years and MSIII.

Students interested in taking a summer elective need to have prior approval from the Director or Associate Directors prior to registering for the course; if not, they will be responsible for tuition fees.

MST Program Seminar

Students in the first two years attend a weekly MST Program seminar (Wednesdays at 12 PM) as a course for one (1) credit hour. The seminars provide a forum for MST Program students to present their research to the program, students, and faculty. All students in their research years present a yearly research-in-progress seminar and first and second-year student's present post-rotation seminars. Each presenting student meets with the Program Directors following their talk. Topics such as Mental Health and Stress, Interpersonal Education, How to study for Anatomy and Step 1 are also presented. MSI and MSII students register for this course, as **attendance at the Seminar is required for MSI and MSII students**. In the event of a schedule conflict or other circumstance, the student needs to contact the Program Director, Associate Directors, and/or Program Administrator in advance and explain why attendance will not be possible.

Grades

MSI and MSII students are required to submit all of their grades to the Administrator. This includes final grades, all coursework, exams scores, and USMLE scores. In addition, the MST Program requires that students submit grades on all interim and mid-term exams so that the Directors can monitor their progress in a timely and effective manner and provide alternative or additional study aids as required.

MSTP students are required to pick **two** Medical School courses from MSI and/or MSII to take for Graduate School credit and receive a letter grade (A/B/C) instead of Pass/Fail. This allows students to schedule their Ph.D. Comprehensive Exam at the required time. Once you have chosen your two courses, the student will not be able to switch courses they want for grade.

MSTP students are subject to the School of Medicine rules to Medical School courses. Should a MSTP student not achieve a passing score in the medical school course they chose to take for Graduate School credit, they letter grade will be reflected as such on their transcript.

Medical School Phase I (MSI)

Registration

Students are coded as graduate students during the first two years and research years of the Program. During the research years, students are on approved Leave of Absence from the School of Medicine and their return is contingent upon successful progress, defense, and submission of their thesis.

In order to have enough Graduate School credits to take the Comprehensive Exam by the required deadline during the research years, students will take two of their essentials core (i.e., MSI and MSII) Medical School courses as Graduate School courses (see section on **Grades**). Students will decide in advance which of the Medical School courses will be taken for graduate credit. Please remember that Graduate School courses are graded differently than Medical School courses (A/B/C vs. Pass/Fail).

During the MSI year, the MST Program Curriculum integrates medical and graduate courses, resulting in a very demanding and challenging year. Focusing on the required coursework takes up a substantial amount of time. In addition, the time allotted to summer laboratory rotations is limited and MST Program students should focus solely on this Program requirement during this period. Thus, to allow for optimal performance, balance and downtime, the MST Program requires that students NOT take other Medical School electives or additional clinical volunteer experiences during the MSI year or during laboratory rotations. If you desire to take an elective or volunteer in a clinic, the time to do so is in the fall semester of MSII. To take an elective in your MSII year, you need prior approval from Dr. Arthur Gutierrez-Hartmann. Students who drop a Medical School elective course after the add/drop deadline are responsible for paying for the tuition.

Fall Semester 2019

IDPT 5000	Foundations of Doctoring I	2.0 credits	
IDPT 5001	Human Body	7.0 credits	
IDPT 7806	GS: Core Course I	6.0 credits	Letter Grade
IDPT 7810	GS: Core Course Topics I	2.0 credits	Letter Grade
IDPT 7810	GS: Core Course Topics II	2.0 credits	Letter Grade
IDPT 7805	MSTP: Molecules/Medicine	3.2 credits	Letter Grade
IDPT 7645	MSTP Seminar	1.0 credits	Letter Grade

Spring Semester 2020

IDPT 5000	Foundations of Doctoring I	2.0 credits	
IDPT 5003	Blood and Lymph	4.0 credits	
IDPT 5004	Disease and Defense	5.0 credits	
IDPT 5005	Cardio/Pulmonary/Renal	9.5 credits	
IPED 5002	Interprofessional Education I - Ethics	1.0 credits	

IDPT 7645 MSTP Seminar 1.0 credits Letter Grade

XXX XXXX Graduate School Elective 1-6 credits Letter Grade

Depending upon the specific schedules of the graduate and medical school courses during the fall of the first year, there may be conflicts. Each year, these will be identified and a plan for resolution will be developed by the first year MSTP students prior to the start of classes.

MSTP Graduate Preliminary Examination

The Graduate School requires that graduate students must pass a Preliminary Examination, given at the end of the first year after completing graduate courses, in order to continue in graduate school and the Graduate Program. Each Graduate Program has its own specific requirements for the Preliminary examination. For the MST Program, the Preliminary Examination is a grant writing exercise whereby first-year students develop a 7-page written research proposal during the latter half of the Spring MST Program Noon Seminar sessions (Course #: IDPT 7645), as part of the MSTP Grant Writing course. Topics will be chosen from areas covered during the Fall MST Program M2M Course (Course #: IDPT 7805), and MST Program leadership must first approve the chosen topic. The proposals will be reviewed by the MSI class in a study-section manner in late spring. A Preliminary Examination that is considered to be failing work can be grounds for dismissal, or at the discretion of the Program, the student may be allowed to retake the entire examination or a portion thereof. The grade results of the MST Program Preliminary examination will be reported to the Graduate School Office.

The key points that will be evaluated include:

- development of a precise, clearly articulated hypothesis addressing a biological mechanism
- concise aims that directly test the hypothesis
- review of relevant background and presentation of clear rationale
- rigorous, creative research plan with appropriate controls
- interpretation of expected data and statistical analysis
- impact of results for the field

Summer Research Rotations

The choice of a research advisor is perhaps the most important decision of the student's first two years in the program. The quality of the projects underway in the laboratory, the influence of postdoctoral fellows and other students in the lab, the level of the advisor's involvement, and the character of the advisor's relationship with the student will all help shape the rotation experience.

Students begin their first required summer rotation (10 weeks) after completion of the first-year curriculum. Students complete a second laboratory rotation (8-10 weeks) after their second year and after completing the USMLE Step 1 exam. If the choice of thesis laboratory has been made, the rotation is often used to gain experience not available in the laboratory of the thesis advisor. If not, this serves as a second trial rotation.

Research rotations are an important part of the academic program during the first phase of MST Program training. The principal purpose of these rotations is to aid students in selecting a thesis

advisor and to provide exposure to a variety of research problems and laboratory techniques. While rotating, students should participate in all lab activities to get an idea of what it would be like to be a member of that particular lab. These activities include lab meetings, journal clubs, and seminars (departmental and other relevant seminars).

Exposure to the training faculty's research during the interview process and the weekly MST Program Seminars gives our students a good foundation from which to choose a summer laboratory mentor. Attending Program-specific retreats is also encouraged when they do not pose serious conflicts with other commitments. Each student will also meet with the MSTP Program Director and/or Associate Directors in a personal counseling session to discuss his or her research interests and suggestions for appropriate laboratory selection.

First- and second-year students are encouraged to discuss potential projects with the various faculty whom they are considering for a rotation, and to visit their laboratories and attend their laboratory meetings. **MSI students should have their lab rotations choice secured and reported to the MSTP Office by March/spring of their first year; MSII students should have their lab rotations choice secured and reported to the MSTP Office by December.**

A Summer Rotation/Thesis Lab Selection Form must be completed by each student prior to the start of the laboratory rotation. This enables the MST Program Office to keep track of the student during the summer months and assists the Program Director and Academic Advisor in keeping an accurate record of each student's progress. Students will also complete a rotation abstract form for their files after their rotation is complete.

Two laboratory rotations must be completed prior to choosing a thesis lab. If the MSTP Student has not matched into a thesis lab after the second rotation, due either to loss of financial support by a pending PI or due to the student feeling that neither the first nor second rotation would be a good match for him/her, then a third rotation is allowed. A fourth rotation requires the approval of the MSTP Leadership.

Students are allowed to enter thesis laboratories of MST Program training faculty only – all current training faculty can be found on the website [HERE](#). Students begin their first required summer rotation after completion of their MSI SOM final exams, and must begin no later than one week after final exams. Summer lab rotations are 10 weeks in length; at the end of the rotation, students present their results as a post-rotation seminar in the fall during the weekly MST Program Seminar Course.

Medical School Phase II (MSII)

In the second year, the MST Program students complete the medical school pre-clinical course requirements and must take the USMLE at the end of the second year (in April), fulfilling the School of Medicine requirement that this examination is passed before clinical work can be undertaken. Any delay in taking this exam must be approved by the Associate Dean of the Office of Student Life.

By the end of the first two years, MST Program students will have completed all of the pre-clinical medical school requirements, two years of the Foundations of Doctoring course, the core graduate course requirements for most graduate programs, the MSTP Graduate Preliminary exam, USMLE Step 1 exam, one to two laboratory rotations, and taken the Medical School Ethics Courses.

Fall Semester 2019

IDPT 6000	Foundations of Doctoring II	2.0 credits	
IDPT 6001	Nervous System	7.5 credits	
IDPT 6002	Digest/Endo/Metabolic Systems	9.5 credits	
IPED 6001	Ethics Health Professions 2	1.0 credits	
IDPT 7645	MSTP Seminar	1.0 credits	Letter Grade

21 Total Credits

Spring Semester 2020

IDPT 6000	Foundations of Doctoring II	2.0 credits	
IDPT 6003	Life Cycle	5.0 credits	
IDPT 6004	Infectious Disease	4.5 credits	
IDPT 7645	MSTP Seminar	1.0 credits	Letter Grade

12.5 Total Credits

USMLE Step I

The United States Medical Licensing Examination (USMLE)[™] is a single, three-step examination for medical licensure in the United States. USMLE is sponsored by the Federation of State Medical Boards (FSMB), and the National Board of Medical Examiners® (NBME®). USMLE provides a common evaluation system for all US applicants for medical licensure. Performance on the USMLE is reported to medical licensing authorities in the United States for use in granting the initial license to practice medicine.

Computer-Based Testing for USMLE[™] began for Step 1 in May 1999, Step 2 in August 1999, and Step 3 in November 1999. The last paper and pencil administration of Step 1 occurred on October 20-21, 1998. Students register with the National Board of Medical Examiners (NBME) and are given a permit to sit for this exam at a local testing site.

Step I assesses whether a student can apply the knowledge and understanding of key concepts of basic biomedical sciences, with an emphasis on principles and mechanisms of health, disease and modes of therapy. In recent years, an integrated testing approach has been emphasized. An

informational meeting is scheduled by the School of Medicine in the spring to discuss the registration process and examination details. Also, the SOM administers a “Pre-Test” to all MSII’s to assess his/her strengths and weaknesses; if a student performs below passing on the pre-test, both the SOM and MST Program institute tutor-based intensive review sessions. MST Program students must take the Step I exam, according to the Medical School Requirements, prior to the start of the MSIII clinical rotation.

Scheduling USMLE STEP I

The deadline for MSTP MSII students to take USMLE Step I is the same as for all SOM MSII students. Further, similar to SOM students, after taking STEP I, MST Program students start their clinical rotation when the MSIII year begins. Achieving a passing score on USMLE Step I is REQUIRED in order to progress to an MSIII clinical rotation. Students must receive permission from the Director and/or the Associate Directors if they are unable to meet this deadline. **Students who delay their exam without prior approval from the SOM, MSTP Director, and/or Associate Directors will be in violation of professionalism and honor code and will be sent to the Promotions Committee to review.**

In the event that an MST Program student is advised by the SOM to schedule STEP I for a later date, the student must inform the MST Program of this change and plan a revised schedule that is approved by both the SOM and the MST Program.

The Research Years

Typically, students enter their doctoral thesis laboratory by the beginning of the fall semester. If a student has not identified a suitable thesis advisor by the end of the second summer rotation or feels that the rotation time was insufficient to make such an important choice, the student is allowed to take a third rotation in the fall of the third year. This rotation can either be in a different laboratory altogether or in one of the two original rotation laboratories. Students must discuss a third rotation with Drs. Arthur Gutierrez-Hartmann or Patricia Ernst.

Students planning to pursue graduate training at CU Boulder must complete any and all necessary paperwork to transfer to the CU Boulder Graduate Program of choice during this second summer. The student must formally withdraw from the University of Colorado AMC Graduate School. Contact Liz Bowen (303-724-4600, elizabeth.bowen@ucdenver.edu) for information on this process.

Boulder Programs require students apply to their Graduate School prior to their matriculating year and by the December 1 deadline. If the student's second rotation is in Boulder, they must apply immediately and notify the appropriate Boulder Program Administrators. Contact the Boulder PhD Programs for application processes and requirements.

After the student formally chooses a laboratory for graduate work, he/she joins the relevant basic science PhD Program as a graduate student. During this year, any additional coursework necessary to complete specific requirements of the chosen graduate program is taken. **While some Programs require only one annual Thesis Committee meeting, the MST Program requires biannual meetings.**

Yearly meetings are scheduled with the Director or Associate Directors to review progress and preview plans for return to clinic. In addition, other MST Program activities are scheduled each year that allow contact among thesis-year students and other students and MST Program Director, Associate Directors, and Administrator. Moreover, thesis-year students are encouraged and expected to contact the MST Program Director and/or Associate Directors whenever there are issues that they would like to discuss or about which they seek advice.

MST Program Faculty: Thesis Advisors

The primary mission of the Program faculty is to provide our students with a broad understanding of the basic sciences and rigorous training directed at the interface of scientific research and medicine. It is a major goal of the graduate faculty that MST Program students receive a thorough grounding in basic research. The most important element in this portion of their training is the choice of a thesis advisor. Training faculty members are recruited from both the CU Anschutz faculty and the CU Boulder faculty and must meet the following rigorous criteria:

- Program faculty must be engaged in an independent, active, and funded research
- Program faculty must have a record of training graduate students and postdoctoral fellows for research in basic biomedical science (or for new faculty members, an interest in training)
- Program faculty should maintain a laboratory environment suitable for training graduate students and with adequate physical space for the student.
- Program faculty must have a primary or joint appointment in a basic science department, and must be a member of the Graduate faculty.
- Program faculty should show enthusiasm for training dual degree MST Program students

To be an MST Program thesis advisor, a faculty member must first be approved by the MST Program Credentialing Committee and then by a vote of the full MST Program Executive Committee. Please see the MSTP [website](#) for a complete list of all current MST Program Training Faculty.

Interdepartmental Transfer

Once the choice of a thesis advisor has been made, the student begins the process of formally transferring into the appropriate degree-granting Graduate Program. The MST Program Director contacts the potential advisor to ensure that appropriate funding mechanisms are in place for the MST Program student and to provide a smooth transition from our program to the elected graduate program.

The student must submit a Request for Transfer to Degree-Granting Program form, complete with all required signatures, to the Graduate School Office – see the MSTP Administrator for the form. The MST Program Office will forward a copy of student's transcripts, MST Program application and biosketch to update the student's file in their newly chosen Graduate Program. This process must be completed by December, during the MSII year, for students considering transferring to one of the CU Boulder programs for their PhD thesis work.

Once the interdepartmental transfer has been approved, the student is now counted as a member of the elected Graduate Program. The Graduate School Program Administrator is the contact for any and all questions regarding registration, tuition, fees, health insurance, etc. A valuable resource are the program program-specific Student Handbooks. Additional information specific to a student's degree-granting program can be obtained from the student's Graduate Program Administrator, Graduate Training Advisor, or on the specific Graduate Program website. The Handbooks outline general information pertaining to the Graduate School at the University of Colorado.

Registration During Thesis Years

During the research years, students must register for the fall and spring semesters to be considered a full-time student for the academic year. Students should consult with their Program Director, Advisor, and/or Administrator regarding the classes for which he/she should register and if he/she should register for the summer semester. **Students must enroll in the Research Ethics course offered during their first year in the lab** (the Ethics course offered in Boulder as well as the Immunology or Pharmacology Program courses meet this requirement). Students who do not register by the add/drop deadline will be responsible for the consequent late fee.

Course registration is available on-line through the Student Web Portal. To access the web registration and other services go to <http://ucdenver.edu/students/portal/Pages/default.aspx>

A student will be considered to be carrying a full load during a regular term for purposes of determining residence credit if they are registered for a minimum of 5 hours in thesis and/or didactic work numbered 5000 or above. Contact your Graduate School Program Administrator for more specifics as to number of credits and courses required each semester.

Longitudinal Foundations of Doctoring (FOD) - Thesis Year Course

Between the basic science and clinical years, while doing their Ph.D. thesis research, MST Program students are required to enroll in a one-day-per-month, MST Program-specific Thesis Years - Foundations of Doctoring Course (IDPT 7655) to continue their clinical training during the thesis years. Goals of this course are to maintain and further the clinical skills learned during Phases I and II, provide opportunities to engage in clinical/translation scholarly activities, experience potential career choices, and minimize the anxiety often encountered upon re-entry into the clinics after an extended absence. Grading will be based on attendance and performance, with initiative, ownership, and personal responsibility used to measure students' progress. Registering for this course, MST Program students acquire the usual liability protection provided to all medical students.

CU Anschutz MSTP students are required to enroll in the Thesis Years-FOD Course (IDPT 7655) for two (2) of the three (3) semesters per year (fall, spring, or summer)*; fall and spring are preferred. MSTP students are expected to attend a minimum of FOUR full-days (once a month) or EIGHT half-days (twice a month) per semester, even in the summer term.

***CU Boulder students must register in the fall and spring only. They CANNOT register in the summer.**

Students must update their BCLS certification every other year. It is the student's responsibility to ensure that their documentation is current.

Comprehensive Examination

The Comprehensive Exam is usually completed 9 – 15 months after entering the thesis lab, though this varies depending on the selected degree program. MST Program students usually have accumulated ~45 hours of required coursework about nine months after entering their thesis lab and are strongly encouraged to take the Comprehensive Exam at this point. Students must formally apply for Admission to Candidacy for the Ph.D. degree on forms supplied by the Graduate School Office at least two weeks before the Comprehensive Examination can be scheduled.

Any coursework taken more than five years prior to the date of the Comprehensive Examination must be validated by a process determined by the student's respective Program Director. The Director will advise the Graduate School in writing that such courses have been validated prior to the student's advancement to candidacy.

In order to progress to candidacy for the Ph.D. degree, students **MUST** pass the Comprehensive Exam in their field of concentration and related fields. This examination may be oral or written or both, and will test mastery of a broad field of knowledge, not merely the formal coursework completed. In most Programs, the Comprehensive Exam consists of submitting a NIH-style grant proposal, typically focused on the student's proposed thesis questions.

Student Grants and Individual Funding

There are several NIH pre-doctoral grant/award opportunities specifically targeting M.D./Ph.D. students. CU Anschutz MST Program students who are eligible for these awards must submit an application. Specifically, areas supported include Neurosciences Drug Addiction, Mental Health, Cardiology, Pulmonary, Renal, Endocrinology, Gastroenterology, Hematology, and Environmental Health and Toxicology. In addition, training awards for Underrepresented Minority (URM) students are available. Predoctoral training awards are also available from the DOD and a number of foundations.

Please refer to the Appendix for a list of fellowships available (this list is included in the letter to the PI/mentor when the MSTP student joins his/her laboratory).

Thesis Committee Meetings

CU Anschutz MST Program students typically select a member of the CU MSTP Steering Committee to join their Thesis Committee. Students must schedule **two** thesis committee meetings per year. While some Programs require only one annual Thesis Committee meeting, the MST Program requires biannual meetings. A Thesis Advisory Committee meeting summary must be completed by the chair of the committee after each committee meeting.

Thesis

A thesis based upon original investigation and showing mature scholarship and critical judgment as well as familiarity with tools and methods of research is written on a subject approved by student's major Program. To be acceptable, the dissertation constitutes a worthwhile contribution to knowledge in a student's specific field. The student must submit finalized draft copies of the thesis to the final exam committee at least two weeks prior to the final examination date. Please note that many Graduate Programs now require that students submit, and be accepted, a first-author manuscript prior to defense of the thesis. Also, the final draft of the thesis may require approval by the mentor and the chair of the Thesis Committee before allowing a date for the formal defense to be scheduled. Notification of the date of the seminar will be posted in Departmental and Program offices.

All dissertations comply with the specifications of the Graduate School. Please note: copyright approval must be obtained from publishers for any figures, tables and/or text included in the thesis that have been already published.

Dissertations must follow Graduate School formatting requirements, which can be downloaded from the Graduate School's website.

Please refer to your Graduate School Program Handbook for detailed information on thesis hours, defense, time limit, and transfer of credit. Remember that thesis preparation and defense usually take longer than anticipated. Keep a sense of urgency to finish it well in advance of deadlines. **A bound, approved copy of the PhD dissertation MUST be submitted to the MSTP office. MSTP will reimburse the student for this copy.**

Return to Clinical Years Survey

In early fall of each year, students in their research years will be asked about the student's proposed date to return to the clinical years. This information is intended only to provide both the MST Program and the School of Medicine an estimate of the return date; it is not a binding agreement.

For those students who will be returning to Medical School, their response is the first communication with the Medical School indicating the student's upcoming transition back to Medical School. Both the student and thesis advisor should indicate the best estimation of the student's return. The student will be added to the database of current SOM MSII students and will receive mailings regarding registration and schedule planning for their MSIII year. If students indicate that they will be returning to Medical School sometime during the upcoming academic year, they will automatically be registered for the Transition to Third Year course (ICC), which takes place during the third or fourth week in April. Students must take this two-and-a-half-day course before he/she may begin their third year of

medicine. **It will be the responsibility of the student to withdraw from the course if they end up not returning in the upcoming academic year.**

Note: The School of Medicine is having fewer Step 1 Exam delays, therefore more students to schedule for clerkships. If you return to medical school off-cycle (June-August), you may see a delay in receiving your clerkship schedule; however, the OSL will do their best to schedule you

Medical School Phase III/IV (MSIII/IV)

Transition to Clinic

Once a student has set a tentative date for their return to Medical School, they should make an appointment to meet with Dr. Arthur Gutierrez-Hartmann, who can begin advising on the process for re-entry to the SOM. The meeting will focus on an individualized plan for refreshing clinical skills and preparing for a return to Medical School. Contact Ruhiyah Issah or Liz Bowen in the MSTP Office to schedule a meeting with Dr. Gutierrez-Hartmann.

MST Program students must complete ALL requirements for their Ph.D. degree, including the thesis defense and final revisions on the thesis, prior to starting the MSIII curriculum. Appropriate meetings will be scheduled throughout the year to keep students up-to-date on the return to Medical School process and timelines to ensure adequate time for the completion of all steps necessary for their return.

MST Program students must be registered for senior medical school courses/electives of your choice throughout the entire MSIV academic year.

An appointment should also be made with Dr. Nichole Zehnder Assistant Dean of Medical Student Affairs, to discuss the third- and fourth-year curriculum and begin work on a schedule for those years with Deborah Jackson. Please call (303) 724-6407 or email at nichole.zehnder@cuanschutz.edu.

Students' ID Badges are valid for four years, so students who do not renew their ID Badge during thesis years will need to request a new badge before returning to clinics. See the MSTP office for assistance.

Immunization Requirements

The following immunizations should be part of students' medical records as proof of immunizations needed at time of matriculation. Students will need to contact the Medical Records Release of Information Office at (303) 372-7330 to retrieve their archived records [if they are covered by student health insurance] and request that the records be faxed to AF Williams Medical Center. Students are responsible for the cost of any needed immunizations.

- MMR: two series
- Polio: childhood set of four series
- Varicella: evidence of date of illness, positive titer, or two shots one month apart for negative titer
- Hepatitis B series: three-shot series at four- and eight-week intervals. If more than one year lapsed between first and third shot, students will need a titer
- Tetanus: good for 10 years

Alpha Omega Alpha (AOA)

Although students at this Medical School are not ranked, opportunities are available for students to receive awards and other recognition for their performance. One example is Alpha Omega Alpha (AOA), a national medical honor society. Junior AOA is based on honors points accrued during the first two years of medical school and MSTP students should apply during the year after they complete these two years of core curriculum (i.e., during their third year, or while they're in their first year of research).

The selection, done by current student members of AOA, is based on the academic qualifications and personal qualities of the student. This requires a review of the candidate's academic record by the student members of AOA. Such review is possible only if the student grants written permission to the society, thus MST Program students must respond and provide this written permission of if they wish to be considered.

Please make note of the following important instructions to be considered:

1. Students must consent to allow current AOA students to review their student files.
2. Students must provide an updated CV including clinical, research, educational, community and leadership activities.
3. Students must submit a 1-page summary/statement detailing their reasons for seeking AOA elections. The summary should focus on scholarship, leadership, and service activities during Medical School; do not include activities that occurred prior to Medical School enrollment.

SOM Elective Credit for Thesis Work

Students returning out of synchrony (i.e., not with the first MSIII block) may petition the School of Medicine to credit their doctoral thesis work for up to 15 weeks towards the School of Medicine graduation requirement of 32 weeks of 8000-level courses. The Program Director and/or the Chair of the Clinical Transition Committee must sign the petition. The signed petition is presented to and approved by the Associate Dean for Student Affairs. Credit will not be provided for those students simply seeking extended vacation time. See the MSTP office for the form.

USMLE Step II

Step II assesses whether a student can apply the medical knowledge and understanding of clinical science considered essential for the provision of patient care under supervision, including emphasis on health promotion and disease prevention. It is intended to ensure that due attention is devoted to principles of clinical science that underlie the safe and competent practice of medicine. The USMLE Step II examination is usually taken soon after completion of MSIII. The School of Medicine requires a passing score on USMLE Step II for graduation.

MST Program Alumni

Mailing List

University of Colorado MST Program graduates are required to provide a forwarding address, both email and postal, for future correspondence. Alumni will be added to a University of Colorado MSTP distribution list and will continue to receive newsletters and important announcements. Alumni will also be contacted during grant renewals for current positions and recent publications.

Publications, Positions and Funding Support

NIH requires the MST Program to track publications and positions of current and past students, so graduates of the CU-AMC MST Program must report recent publications and career progress. The University of Colorado MSTP website will soon have a PubMed link to all alumni publications. Similarly, funding records will also be requested in order to assess overall success as an

investigator in academic medicine. **To aid in tracking, we require MSTPs to create a uniform ORCID identifier number and report this number to our office.**

Leave of Absence Requests

Leave of Absence requests that occur during the first two years or the last two years of medical school and during the period between completion of USMLE Step 1 and committing to a PhD-degree-granting graduate program will require that the MSTP student meet with MSTP and SOM leadership to discuss this option. The student will be required to write a letter stating the reason for the request, a plan of action during the LOA, and a plan for return to MSTP and/or the SOM. A copy of this letter should be submitted to the SOM Associate Dean of Students and to the Dean of the Graduate School. The SOM Promotions Committee will review such requests and make final decisions.

If the Leave of Absence occurs during the thesis years, the MSTP student should confer with the MSTP Leadership, his/her PI/mentor and the student advisor of their graduate program (and likely the Program Director as well). Again, the student will be required to write a letter stating the reason for the request, a plan of action during the LOA, and a plan for return to MSTP and/or the thesis laboratory. A copy of this letter should be submitted to the SOM Associate Dean of Students, with the mentor and the graduate program making the final decision.

When students take a Leave of Absence, per University Policy, all financial support, including medical insurance coverage, will be suspended until the student returns to active MSTP, Graduate and/or SOM status. Some arrangements can be made for the student should insurance be necessary for them while on leave. This is determined on a case-by-case situation.

Dismissal and Appeals

As noted in the “Expectations” section of this Student Handbook, there are clear professionalism behaviors and tangible academic and research milestones that every MST Program student must meet in order to remain in good standing as an MSTP student. The MST Program, directors and administrators, including SOM leadership will support students through any and all difficulties at any point during both their medical and graduate school years.

Grounds for dismissal from MSTP include: poor academic performance; subpar performance in the laboratory rotations; professionalism issues; failing the Preliminary Exam; failing the Comprehensive Exam; poor progress in their PhD Thesis work; or dismissal from their Graduate Program and Graduate School.

Students who the program feels are eligible for dismissal will be asked to meet with the Program Director, Associate Directors, and/or SOM Leadership at any point in the program to review their behavior, training progress, and commitment to the program. The student will be given a warning until the program feels the student has remedied their situation.

The MSTP Leadership will schedule regular meetings with the student, as they feel necessary, to continue to review the student’s progress. The student can also schedule meetings with any of the Directors at any time during this period.

Dismissing a student from MSTP is done only after very careful review, by the MSTP Executive Committee, of the student’s behavior, professionalism, academic and research training progress, and

commitment to a career as a physician-scientist; the MSTP Executive Committee includes MSTP, SOM, and Graduate School leadership faculty. If the decision is to dismiss, by the majority of the MSTP Executive Committee, the student will be notified immediately following review. Finally, upon dismissal from MSTP, the student will no longer receive the financial support (tuition, fees, insurance, or stipend) provided by MSTP.

Dismissal from MSTP does not necessarily mean dismissal from Medical School, but such a result can occur. If dismissal from MSTP occurs, the student will need to submit a formal request in writing to the SOM Associate Dean of Students and the SOM Promotions Committee to continue in medical school. The request to continue as a medical student must be approved by either the SOM Associate Dean of Students and/or the SOM Promotions Committee. See SOM Policies and Procedures [HERE](#).

Below are the basis in which a MSTP student could be dismissed from the MST Program:

- A. Failure to pass the preliminary exam in the spring of year 1. See page 15
- B. The inability to match into a thesis lab due to professionalism issues or because the MSTP student has cumulated subpar performance in the previous rotations such that PI's are not willing to accept that student
- C. Failure to pass the Comprehensive Examination. The student's Graduate Program can dismiss the student from that Program at that point. Dismissal from the Graduate Program results in dismissal from Graduate School and dismissal from MSTP.
- D. Poor academic performance while in medical school and/or graduate school.

Below is the outline of the procedure for Appeal of MSTP Dismissal decisions during distinct periods of the MD/PhD training plan:

- A. **During MSI or MSII** – If dismissal from MSTP occurs within the first two years of medical school, appeals must be submitted in writing to the SOM Associate Dean of Students, the SOM Promotions Committee, and the MSTP Director, stipulating the basis for the appeal.
- B. **During Graduate School/Thesis Years** – If dismissal from MSTP occurs at any point after the MSTP student has committed to a graduate program and/or is on a Leave of Absence from the SOM, appeals regarding the dismissal from their graduate program (and thus from the Graduate School) must be submitted in writing to the to the Dean of the Graduate School stipulating the basis for the appeal; with copies to the Graduate Program Director, the MSTP Director, and the SOM Associate Dean of Students,
- C. **During MSIII or MSIV** – If dismissal from MSTP occurs during the last two years of medical school, appeals regarding the dismissal from MSTP at this point in the training must be submitted in writing to the to the Associate Dean of Students, the SOM Promotions Committee and the MSTP Director, stipulating the basis for the appeal.

Appendix

Departmental Graduate Programs

Listed below are the graduate programs affiliated with the MST Program. Key contact information has been provided. Please reference the program websites for specific information regarding pre-requisites, program-specific seminars and activities, faculty members and their research interests, thesis information, etc. **A link to the program webpages can be found [HERE](#).**

ANSCHUTZ MEDICAL CAMPUS (13)

Bioengineering

Program Director: Dr. Robin Shandas; Program Administrator: Natalie Kersten

Cancer Biology

Program Director: Dr. Mary Reyland; Program Administrator: Sabrena Heilman

Cell Biology, Stem Cells and Development

Program Director: Dr. Jeff Moore; Program Administrator: Caitlin Moloney

Computational Bioscience

Program Director: Dr. Larry Hunter; Program Administrator: Caitlin Moloney

Epidemiology

Program Directors: Dr. Tessa Crume and Dr. John Hokanson; Program Administrator: Cassandra Thao

Human Medical Genetics and Genomics

Program Director: Dr. Tamim Shaikh; Program Administrator: Maia Evans

CU BOULDER CAMPUS (4)

Chemical & Biological Engineering

Program Director: Dr. Kristi Anseth
Graduate Advisor/MSTP Liaison: Dr. Kristi Anseth
Program Administrator: Dominique de Vangel

Mechanical Engineering

Department Chair: Dr. Michael Hannigan
Graduate Advisor/MSTP Liaison: Dr. Mark Rentschler
Program Administrator: Andrew Angely

Immunology

Program Director: Dr. Laurel Lenz; Program Administrator: Michele Hwozdyk-Parsons

Integrated Physiology

Program Director: Dr. Jim McManaman; Program Administrator: Deanne Sylvester

Microbiology

Program Director: Dr. Thomas E. "Tem" Morrison; Program Administrator: Michele Hwozdyk-Parsons

Molecular Biology

Program Director: Dr. Rytis Prekeris; Program Administrator: Sabrena Heilman

Neuroscience

Program Director: Dr. Sukumar Vijayaraghavan; Program Administrator: Deanne Sylvester

Pharmacology

Program Director: Dr. J. David Port; Program Administrator: Shanelle Felder

Structural Biology and Biochemistry Program Director: Dr. Mair Churchill; Program Administrator: Maia Evans

Biochemistry

Department Chair: Dr. Natalie Ahn
Graduate Advisor: Dr. Robert Batey
MSTP Liaison: Dr. Roy Parker
Program Administrator: Pamela Williamson

Molecular, Cellular and Developmental Biology

Department Chair: Dr. Lee Niswander
Graduate Advisor/MSTP Liaison: Dr. Ken Krauter
Program Administrator: Karen Brown

List of T32 Predoctoral Programs and Funding (AMC)

T32 Ageing; T32 Cancer Biology; T32 Head and Neck Cancer; T32 Immunology T32 Molecular Biology T32 Neuroscience; T32 Pediatric Hematology & Oncology; T32 Pharmacology; T32 Rheumatology & Immunology

MSTP Executive Committee Members: 2019 – 2020

Arthur Gutierrez-Hartmann, MD – Director, MSTP
Patricia Ernst, PhD – Pre-clinical Associate Director, MSTP
Cara Wilson, MD – Clinical Associate Director, MSTP
Brian Dwinnell, MD – Associate Dean, Office of Student Life
Nichole Zehnder, MD – Assistant Dean of Admissions & Student Affairs, OSL
Andy Bradford, PhD – Assistant Dean of Medical School Curriculum
Shawna Cox, PhD – Assistant Dean, Graduate School
Matthew Taylor, MD – Director, Adult Medical Genetics Program
Jennifer Adams, MD – Assistant Dean, Medical Education and Clinical Curriculum
David Port, PhD – Chair of MSTP Admissions Committee
Liz Bowen, BA – Program Administrator, MSTP

MSTP Steering Committee Membership: 2019 - 2020

Arthur Gutierrez-Hartmann, MD	Medicine, Biochemistry & Molecular Genetics (MOLB, CANB, REPS)
Patricia Ernst, MD	Pediatrics (MOLB, PHCL)
Cara Wilson, MD	Medicine (IMMU)
Matt Taylor, MD	Medicine (HMGGP, NRSC)
Bruce Appel, PhD	Pediatrics (CSDV, NRSC)
Andy Bradford, PhD	Ob/Gyn (CANB, IPHY, MOLB)
Lee Niswander, PhD	Molecular Cellular & Developmental Biology (MOLB, CSDV, HMGG)
David Port, PhD	Medicine, Pharmacology (PHCL)
Mary Reyland, PhD	Pathology, Cell and Developmental Biology (CANB, MOLB)
Rytis Prekeris	Biochemistry & Molecular Genetics (CANB, HMGG, MOLB)
Richard Benninger, PhD	Bioengineering (BIOE)
Raul Torres, PhD	Immunology (IMMU)
Roy Parker, PhD	Chemistry/Biochemistry, (BIOCH)
Kristie Anseth, PhD	Chem & Biol Engineering (CHBE)
Ken Krauter, PhD	Molecular, Cellular and Developmental Biology (MCDB)
Sukumar Vijayaraghavan, PhD	Physiology and Biophysics (NRSC)
Student Members	MSTP Student Council Leadership

Additional External Funding Sources that do not exclude MD/Ph.D. Trainees

Please visit the websites for deadlines, qualifications, and funding applications.

Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral Fellowships (F31) to Promote Diversity in Health-Related Research

<http://grants.nih.gov/grants/guide/pa-files/PA-10-109.html>

Participating Organizations

National Institutes of Health (NIH), (<http://www.nih.gov/>)

Agency for Healthcare Research and Quality (AHRQ), (<http://www.ahrq.gov>)

Components of Participating Organizations

National Cancer Institute (NCI), (<http://www.nci.nih.gov/>)

National Center for Complementary and Alternative Medicine (NCCAM), (<http://www.nccam.nih.gov/>)

National Center for Research Resources (NCRR), (<http://www.ncrr.nih.gov/>)

National Eye Institute (NEI), (<http://www.nei.nih.gov/>)

National Heart, Lung, and Blood Institute (NHLBI), (<http://www.nhlbi.nih.gov>)

National Human Genome Research Institute (NHGRI), (<http://www.nhgri.nih.gov/>)

National Institute on Aging (NIA), (<http://www.nia.nih.gov/>)

National Institute on Alcohol Abuse and Alcoholism (NIAAA), (<http://www.niaaa.nih.gov/>)

National Institute of Allergy and Infectious Diseases (NIAID), (<http://www.niaid.nih.gov/>)

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS),
(<http://www.niams.nih.gov/>)

National Institute of Biomedical Imaging and Bioengineering (NIBIB), (<http://www.nibib.nih.gov/>)

National Institute of Child Health and Human Development (NICHD), (<http://www.nichd.nih.gov/>)

National Institute on Deafness and Other Communication Disorders (NIDCD),
(<http://www.nidcd.nih.gov/>)

National Institute of Dental and Craniofacial Research (NIDCR), (<http://www.nidcr.nih.gov/>)

National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK),
(<http://www.niddk.nih.gov/>)

National Institute on Drug Abuse (NIDA), (<http://www.nida.nih.gov/>)

National Institute of Environmental Health Sciences (NIEHS), (<http://www.niehs.nih.gov>)

National Institute of General Medical Sciences (NIGMS), (<http://www.nigms.nih.gov>)

National Institute of Mental Health (NIMH), (<http://www.nimh.nih.gov/>)

National Institute of Neurological Disorders and Stroke (NINDS), (<http://www.ninds.nih.gov/>)

National Institute of Nursing Research (NINR), (<http://www.ninr.nih.gov/>)

Office of Dietary Supplements (ODS), (<http://www.ods.od.nih.gov/>)

Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral MD/PhD and Other Dual Doctoral Degree Fellows (Parent F30)

<http://grants.nih.gov/grants/guide/pa-files/PA-11-110.html>

Participating Organizations National Institutes of Health (NIH), (<http://www.nih.gov/>)

Components of Participating Organizations

National Cancer Institute ([NCI](#))

National Institute on Aging ([NIA](#))

National Institute on Alcohol Abuse and Alcoholism ([NIAAA](#))

National Institute on Deafness and Other Communication Disorders ([NIDCD](#))

National Institute on Dental and Craniofacial Research ([NIDCR](#))

National Institute of Diabetes and Digestive and Kidney Diseases ([NIDDK](#))

National Institute on Drug Abuse ([NIDA](#))

National Institute of Environmental Health Sciences ([NIEHS](#))

National Institute of Mental Health ([NIMH](#))

Special Note: Applicants are cautioned that not all NIH Institutes and Centers (ICs) participate in this program, and that consultation with relevant IC staff prior to submission of an application is strongly encouraged. The participating ICs have different emphases and program requirements for this program. Therefore, a prospective applicant is urged to consult the [Table of IC-Specific Information, Requirements and Staff Contacts](#) to determine whether the planned research and training falls within the mission of one of the participating NIH ICs.

Ruth L. Kirschstein NRSA Program for NIGMS MARC Predoctoral Fellowships (F31) (for minority groups underrepresented in the biomedical and behavioral sciences)

<http://www.nigms.nih.gov/Training/MARC/MARCPredoctoral.htm>

Neurosciences: Several NS-related Institutes, NIDA, NIAA, NIMH, NIDDK, NHLBI, NIEHS, and NINDS, specifically fund MD/Ph.D. Predocotral Awards. Please refer to the website:

http://www.ninds.nih.gov/funding/areas/training_and_career_development/pre-doctoral-fellowship.htm#f31mdphd

Environmental Health and Toxicology: NIEHS, with more information at their website:

<http://www.niehs.nih.gov/careers/research/trainingfrom/fellowships/f30/index.cfm>

NIDDK:

<http://grants.nih.gov/grants/guide/pa-files/PA-11-113.html>

URM:

1) Sponsored through the NIGMS. Contact persons include Drs. Adolphus Toliver and Anthony A. Rene (tolivera@nigms.nih.gov). website:
<http://www.nigms.nih.gov/nigms.nih.gov/Templates/CommonPage.aspx?NRMODE=Published&NRNODEGUID={1C5E94A6-8017-4802-9AD6-AB9AC3E5411A}&NRORIGINALURL=%2fTraining%2fOverview.htm&NRCACHEHINT=Guest#a13>

2) Sponsored through NIDDK

Predoctoral ([F31](#)) for underrepresented ([definition](#)) [minority students](#), for students with disabilities, and for students from disadvantaged backgrounds.

<http://www2.nidk.nih.gov/Funding/TrainingCareerDev/NRSA.htm>

Please keep in mind that there is a five-year limit for NIH pre-doctoral funding from T32 training grants or NRSA fellowships (a 6th year can be granted to MST Program student upon application to the NIH prior to the 6th year). Mentors and student should contact the MST Program office once an application has been submitted and MUST contact the office of the exact period of support on any T32 or individual NRSA award.

American Association of University Women

http://www.aauw.org/learn/fellowships_grants/american.cfm

American Diabetes Association

http://professional.diabetes.org/Diabetes_Research.aspx?typ=18&cid=64383

American Federation for Aging Research Scholarship

<http://www.afar.org/grants.html> – Applications accepted annually in December.

American Heart Association Regional Affiliates Predoctoral Fellowship

<http://www.americanheart.org> or <http://www.americanheart.org/presenter.jhtml?identifier=9713>

American Physiological Society

<http://www.the-aps.org/> or www.the-aps.org/awards/other.htm

American Society for Microbiology Robert Watkins Graduate Fellowship for minorities

<http://www.asm.org/index.php/education/asm-robert-d-watkins-graduate-research-fellowship.html>

American Society for Pharmacology and Experimental Therapeutics

http://www.aspet.org/public/awards/awards_fellowships.html

Boston University Women in Science

<http://www.bu.edu/chemistry/buwic/resources/fellowship/>

Community of Science Funding Opportunities Database

<http://fundingopps2.cos.com/>

Cornell University Graduate Fellowship Notebook

<http://cuinfo.cornell.edu/Student/GRFN>

Department of Defense, CDMRP – Breast and Prostate Cancer

<http://cdmrp.army.mil/>

Ford Foundation Dissertation Diversity Fellowships

<http://sites.nationalacademies.org/PGA/FordFellowships/index.htm>

Fulbright Program Institute of International Education for studies abroad

<http://www.iie.org>

Josephine de Karman Predoctoral Fellowship

<http://www.dekarman.org/Qualifications.aspx>

L'Oreal Foundation Women in Science Predoctoral Fellowships

<http://www.lorealusa.com/en/us/> Applications accepted annually in October.

NASA Individual Predoctoral Fellowship

<http://education.nasa.gov/edprograms/fellowgrants/index.html>

NATO Predoctoral Fellowship With Partner Nations

<http://www.nato.int/science/>

NIH Predoctoral Fellowship Awards for Students with Disabilities (F31)

<http://grants.nih.gov/grants/guide/pa-files/PA-00-068.html>

Paul and Daisy Soros Fellowship for New Americans (The deadline for submission of completed applications is November 1, 2011.)

<http://www.pdsoros.org/competition/>

Sarnoff Cardiovascular Research Foundation Fellowship

<http://www.sarnoffendowment.org/fellowship.shtml>

Proposal Central

<https://proposalcentral.altum.com/>

ProposalCENTRAL is an e-grantmaking website shared by many government, non-profit, and private grant-making organizations. Over twenty thousand applicants and reviewers interact electronically with the grant-makers that are members of ProposalCENTRAL

COLORADO DENVER | ANSCHUTZ
Medical Scientist Training Program

SUMMER ROTATION FORM

Student Name: _____

Student Number: _____

Mentor's Name: _____ **Mentor's Signature** _____

Summer Rotation 1
(please circle one)

Summer Rotation 2

Summer Rotation 3

Lab Address: _____

Lab Phone Number: _____

Project Title: _____

IRB (Human Subject) Protocol Number/ Most Recent Approval Date (if applicable)

IACUC (Vertebrate Animal) Protocol Number/ Most Recent Approval Date (if applicable)

Description of Research Project

(to be submitted at the end of the summer rotation on the Summer Research Description Form)

Signatures required before entering lab

Arthur Gutierrez-Hartmann, MD or
Director, MST Program

Patricia Ernst, PhD
Assoc. Director, MST Program

Date

Elizabeth Bowen
Administrator, MST Program

Date

RESEARCH DESCRIPTION: ROTATION 1 2 3 (circle)

Student Name: _____

Research Advisor: _____

Rotation Title: _____

INTRODUCTION:

BACKGROUND:

SPECIFIC EXPERIMENTAL AIMS:

METHODS AND DESIGN:

RESULTS: