



SCHOOL OF MEDICINE

Medical Scientist Training Program

UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

Student Handbook

2017 - 2018

Updated February 2018

Table of Contents

Expectations of MST Program Students Page 4

- Expectations for PhD Training
- Expectations for Clinical Training
- Expectations for Professionalism

General Information Page 6

- Welcome
- Program Direction
- Program Information
- Program Faculty
- New student Information
- Financial Support
- Student Health Insurance
- ID Cards/Badge Access
- Tuition Bills
- Parking
- Establishing Colorado Residency
- Change of Address
- Student Assistance
- Publications and Acknowledgements
- Participation in Recruitment Functions
- Annual National MD, PhD Student Conference
- Meeting Support
- Training Related Expenses
- Vacations
- Resources Available

Curriculum Page 12

- MST Program Seminar
- Grades

Medical School Phase I (MSI) Page 13

- Registration
- Curriculum

- Graduate School Preliminary Examination
- Summer Research Rotations

Medical School Phase II (MSII) Page 16

- Curriculum
- USMLE STEP I
- Clinical Rotations

The Research Years Page 17

- Interdepartmental Transfer
- MST Program Faculty: Thesis Advisors
- Registration
- Foundations of Doctoring: Thesis Years Course
- Comprehensive Examination
- Thesis Committee Meetings
- Student Grant and Individual Funding
- Thesis
- Return to Clinical Years (MSIII) Survey

MSIII and MSIV (Clinical Years) Page 22

- Transition to Clinics
- Immunization Requirements
- Alpha Omega Alpha (AOA)
- Elective Credit for Thesis Work
- USMLE STEP II

MST Program Alumni Page 23

- Mailing List
- Publications, Positions and Funding Support

Appendix Page 24

- Departmental Graduate Programs
- Steering Committee Members
- Forms
- Funding Sources

Expectations of MST Program Students

The key expectation of each student admitted into the CU Anschutz Medical Campus (CU-AMC) Medical Scientist Training Program is that they take full advantage of all CU-AMC 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 Graduate School Preliminary exam and USMLE Step I exam. In the third year, students are required to first complete one clinical rotation and then 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 3-4 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*). *Students in their thesis years on the Boulder campus must do their FOD course in the Fall and Spring only. 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!

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

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

*<http://www.nbme.org/PDF/Publications/Professionalism-Conference-Report-AAMC-NBME.pdf>

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 complete 1 clinical rotation, 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, Drs. Patricia Ernst and Jorge DiPaola and by members of the MST Program Steering and Executive Committees. In addition, there are two student representatives who serve on the Steering Committee, and one who serves on the Executive Committee. The program's subcommittees and their current chairs are:

Student Advisory:	Arthur Gutierrez-Hartmann, M.D. Patricia Ernst, Ph.D. *pre-clinical years Jorge DiPaola, M.D. *clinical years
Clinical Transition:	Jorge DiPaola, M.D.
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

12631 E. 17th Ave, Room 2601
Academic Office One, Mail Stop B176
Aurora, CO 80045

mstp@ucdenver.edu

T (303)724-4600

F (303)724-2920

Dr. Arthur Gutierrez Hartmann, Director

a.gutierrez-hartmann@ucdenver.edu

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

patricia.ernst@ucdenver.edu

Dr. Jorge DiPaola, Associate Director, Clinical Years

Jorge.dipaola@ucdenver.edu

Liz Bowen, Administrator

elizabeth.bowen@ucdenver.edu

Katie Bidus, Administrative Assistant

katie.bidus@ucdenver.edu

Program Faculty

For a complete list of all current MST Program training faculty please visit,

http://www.ucdenver.edu/academics/colleges/medicalschoo/education/degree_programs/mstp/Faculty/Pages/faculty.asp

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 Admissions Office handles all of the necessary paperwork for admittance to the School of Medicine and plans an orientation week before the fall semester. 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 (send them to MSTP first and we will forward them to the SOM.)
- Final Transcript from degree-granting institution documenting receipt of the undergraduate degree
- Colorado Residency Form (found in the Student Checklist Area of the MD admissions packet)

Email Communications

All communication relating to MSTP, Graduate School, School of Medicine, Faculty, and Staff must be with a “ucdenver.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 “ucdenver.edu” email first.

New-Student Paperwork: Payroll

Before students can receive their stipend, they must fill out the appropriate paperwork with the MST Program and the CU-AMC Payroll Department. PLEASE NOTE: A copy of one’s original social security card is required before students can be entered in the University payroll system. If a student does not have an original card, he/she must apply for one immediately after arrival to Colorado. Students need to get a letter from the clerk in the social security office stating that they have applied for a new card. A copy of this letter must be given to the Payroll Department before they can be paid. When the new card arrives, students need to stop by the MSTP office so they can put a photocopy of the card in the file.

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.** 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 luncheon 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 their fall semester schedule, an orientation packet containing specific programmatic information and other forms.

Financial Support

Accepted students receive full funding, including a stipend (currently \$30,000/year), tuition, health and dental insurance and fees for the entire period of study. Continued support is contingent upon satisfactory academic, research, and professional performance by the student. The MST Program provides the financial support during the first two years of training.

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.**

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 (Plan A) when registered for at least 5 credit hours unless they have alternate health insurance in place and specifically waive the University plan. Before fall semester each year, Students will need to fill out the form- <http://ucdenver.edu/life/services/student-health/Pages/default.aspx> to select the student health plan they prefer or to waive it. 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 CUAnschutzStudentInsurance@ucdenver.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. UCD at AMC 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. If you are MSI-IV, see the MD office for hospital badging.

Tuition Bills

The MST Program Administrator will pay tuition bills at the beginning of each semester. 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.

Parking

Students intending to drive to the Anschutz Medical Campus must contact the Parking Office at (303) 724-1584 <http://ucdenver.edu/about/departments/FacilitiesManagement/Documents/AMC.pdf> to find out where parking is available. There is a monthly fee for parking during normal working hours (M - F, 8AM - 6PM). However, students can park free after hours, so long as students notify the Parking Office that they will be doing this. The Parking Office, which also offers discounted RTD bus passes and keys for the locked bike storage area, is located in Building 500 (left of the cafeteria) at the Anschutz Medical Campus. Please note: a RTD bus pass is included in your student fees.

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." Students need to read this handout 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 at <http://www.ucdenver.edu/student-services/resources/registrar/Documents/RegistrarForms/DDC/ResidencyPetition.pdf>

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@ucdenver.edu
Voice: 303-724-8054
Fax: 303-724-8060

Change of Address

To change one's address go to the student portal - UCDAccess
<https://passport.ucdenver.edu/login.php?page=ucdaccess.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 Director, 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 the Graduate School. 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-AMC 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-AMC 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-AMC MST Program students organize the National Student Conference during their first laboratory year (typically a student's third year in the MST Program). The MST Program covers registration and meeting costs for CU-AMC MST Program students. However, once CU-AMC 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 Director as soon as possible.

We expect all incoming CU-AMC 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-AMC 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 Director as soon as possible to obtain a formal exception to the requirements stated above.

Students that are required to attend are expected to stay the entire length of the conference. If you need to leave early, this need prior approval from the Director.

Vacations

Students may schedule one week vacation during the summer. An optimal time for an MSI/II student to take the vacation is after the laboratory rotation and 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.

Resources Available to MST Program Students

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

Computer/Color Printer (MST Program Office)

Fax Machine in MST Program Office (303) 724-2920

Mail Box in MST Program Office (Campus Box B176)

Use of School of Medicine Computer Lab

Black and White Copier

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 three 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 spend 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 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 Director 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 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. Topics such as how to write a grant, how to present a seminar, how to read a scientific paper, and how to take charge of your research are also presented. **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 Director 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 Honors/Pass/Fail. This allows students to schedule their Ph.D. Comprehensive Exam at the required time.

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. 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.

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. Also, 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 down-time, 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. In addition, you need prior approval from Dr. Arthur Gutierrez-Hartmann and/or Dr. Jorge DiPaola. Students who drop a Medical School elective course after the add/drop deadline are responsible for paying for the tuition.

Fall Semester 2017

IDPT 5000	Foundations of Doctoring I	2.0 credits	
IDPT 5001	Human Body	7.0 credits	
IDPT 5002	Molecules/Medicine Biostats	8.0 credits	Letter Grade – take EBM but do not register
IDPT 5015	Basic Cardiac Life Support	0.5 credits	
IDPT 7806	Core Course I	6.0 credits	Letter Grade
IDPT 7810	Core Course Topics I	2.0 credits	Letter Grade
IDPT 7810	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 2018

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	
IDPT 7645	MSTP Seminar	1.0 credits	Letter Grade
PRMD 5000	Ethics Health Professions I	1.0 credits	
XXX XXX	Graduate School Elective	1-3 credits	

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 developed prior to the start of classes.

Graduate School Preliminary Examination

Each Graduate Program has specific requirements for the Preliminary examination. For the MST Program, first-year students will develop a 7-page written research proposal during the latter half of the Spring MST Program Noon Seminar sessions. Topics will be chosen from areas covered during the Fall MST Program M2M Course, and MST Program leadership must first approve the chosen topic. The proposals will be received by the MSI class in a study-section manner in late spring. The grade results of the MST Program Preliminary examination will be reported to the Graduate School Office on the Application for Candidacy Form.

The key points that will be evaluated include:

- development of a precise, clearly articulated hypothesis
- 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-weeks) after their second year, after completing 1 required third-year clinical rotation. 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 Program Director and/or Associate Director 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. Students discuss choices of potential mentors and research projects with the MSTP Program Director and/or Associate Director and the Advisor of the appropriate Graduate Program.

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.

Students are allowed to enter thesis laboratories of MST Program training faculty only – 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 8-10 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 Dr. Kristina Tocce, Assistant 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 Graduate Preliminary exam, USMLE Step 1 exam, one to two laboratory rotations and taken the Medical School Ethics Courses.

Fall Semester 2017

IDPT 6000	Foundations of Doctoring II	1.6 credits
IDPT 6001	Nervous System	7.5 credits
IDPT 6002	Digest/Endo/Metabolic Systems	9.5 credits
IDPT 7645	MSTP Seminar	1.0 credits Letter Grade
PRMD 6000	Ethics Health Professions 2	.7 credits

20.3 Total Credits

Spring Semester 2018

IDPT 6000	Foundations of Doctoring II	1.6 credits
IDPT 6003	Life Cycle	5.0 credits
IDPT 6004	Infectious Disease	4.5 credits
IDPT 6015	BCLS Update	0.3 credits
IDPT 7645	MSTP Seminar	1.4 credits Letter Grade

12.8 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 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 Director if they are unable to meet this deadline. **Students who delay their exam without prior approval from the SOM, MSTP Director and/or Associate Director 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 the SOM and the MST Program.

Clinical Rotations

Since MSII ends in March, CU-AMC MST Program **REQUIRES** MST Program students to complete one core (6 or 8 week) MSIII clinical rotation before committing to a thesis laboratory. This plan allows MST Program students to gain patient-oriented context for future thesis work, and will allow greater flexibility and clinical expertise for when the students return to the clinics after completing their Ph.D. degree.

The Research Years

Typically, students enter their doctoral thesis laboratory by September. 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, Jorge DiPaola, or Patricia Ernst.

Students planning to pursue graduate training at CU Boulder must complete the 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 Denver AMC Graduate School. Contact Liz Bowen (303-724-4600, elizabeth.bowen@ucdenver.edu) for information on this process. Be aware that there may be some expenses during this process that may have delayed reimbursement.

After the student formally chooses a laboratory for graduate work, he/she joins the relevant basic science department as a graduate student. During this year, any additional coursework necessary to complete specific requirements of the chosen graduate department 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-AMC 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 Steering 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. 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 during the second summer rotation for students transferring to CU Boulder.

Once the interdepartmental transfer has been approved, the student is now counted as a member of the elected Graduate Program. The Graduate Program Administrator is the contact for any and all questions regarding registration, tuition, fees, health insurance, etc. A valuable resource is the Graduate Student Handbook, available on-line at

<http://www.ucdenver.edu/academics/colleges/Graduate-School/Documents/pdf/Graduate-School-Policies-and-Procedures.pdf>

The Handbook outlines all general information pertaining to the Graduate School at the University of Colorado Denver. 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.

Registration During Thesis Years

During the research years, students must register for fall and spring semesters to be considered a full-time student for the academic year. Students should consult with their Program Director or Advisor 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 at least two classes or 5 – 6 hours in work numbered 5000 or above, at least 8 hours, a combination of graduate/professional coursework acceptable for graduate credit or any number of thesis hours (please refer to the Graduate School Handbook).

Longitudinal Foundations of Doctoring 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-AMC MSTP students are required to enroll in the FOD Thesis-Year Course (IDPT 7655) for two of the three semesters per year (fall, spring, or summer); fall and spring are preferred. Students just entering their thesis lab do not start this FOD course until the fall semester. MSTP students are expected to attend a minimum of FOUR full-days (or EIGHT half-days) 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 annually update their HIPAA and PPD certifications and turn in the necessary forms to the MST Program Office. Students must also 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. For example, Immunology students will complete the exam in the fall of the third program year. MST Program students usually have accumulated the 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.

Before admission to candidacy for the Ph.D. degree is granted, 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. Please refer to the Graduate School Handbook for more detailed information. In most Programs, the Comprehensive Exam consists of a 12-page, NIH-style grant proposal, typically focused on the student's proposed thesis questions.

Thesis Committee Meetings

CU-AMC 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. Once the Chair of the Thesis Committee signs off on the form, a copy of the report or minutes from the meeting must be forwarded to the MST Program office by the student.

Student Grants and Individual Funding

There are several NIH pre-doctoral grant/award opportunities specifically targeting M.D./Ph.D. students. CU-AMC 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. Please refer to the Appendix for a list of fellowships available.

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 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 offices.

All dissertations comply with the specifications of the Graduate School. Students should pick up the "Thesis Specification Handbook" at the Graduate School Office. The Graduate School conducts a Thesis Preparation Seminar twice a year, in October and March, to assist students in completing their thesis. 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.

Please refer to the Graduate School Handbook and Thesis Specification 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 December of each year, students in their research years will be sent a Return to Clinical Years Survey Form requesting information regarding the student's proposed return to the clinical years. This form is intended to provide both the MST Program and the School of Medicine an estimate of the return date and is not a binding agreement. Students who are not planning to return to Medical School the following academic year should simply sign the form, secure their research mentor's signature, and return the form to the School of Medicine Student Affairs Office.

For those students who will be returning to Medical School, the return of the form 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 review the form and indicate the best estimation

of the student's return. The student needs to secure all signatures on the bottom half of the form and then forward it to the School of Medicine Student Affairs Office. The student will be added to the database of 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, 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. Students should also refer to the attached time line to get a reference on the sequence of events for return to Medical School.

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. Jorge DiPaola, Clinical Associate Director. Dr. DiPaola 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 information for Dr. DiPaola is as follows:

Telephone: (303) 724-4400

Pager:

Email: Jorge.dipaola@ucdenver.edu

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 time lines 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. Kristina Tocce, Assistant Dean of Medical Student Affairs. Dr. Tocce will discuss the third- and fourth-year curriculum and begin work on a schedule for those years with Katie Watts. Please call (303) 724-6407 or email at Kristina.tocce@ucdenver.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.

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.**

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 website 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:

<http://www.ucdenver.edu/academics/colleges/Graduate-School/prospective/Pages/explore.aspx>

*find the program under 'Explore Doctoral Programs'

ANSCHUTZ MEDICAL CAMPUS

Bioengineering

Program Director: Dr. Robin Shandas
Program Administrator: Nhu Pham

Cancer Biology

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

Cell Biology, Stem Cells and Development

Program Director: Dr. Bruce Appel
Program Administrator: Maia Evans

Computational Bioscience

Program Director: Dr. Larry Hunter
Program Administrator: Elizabeth Wethington

Epidemiology

Program Directors: Dr. Tessa Crume and Dr. John Hokanson
Program Administrator:

Human Medical Genetics and Genomics

Program Director: Dr. Richard Spritz
Program Administrator: Maia Evans

Immunology

Program Director: Dr. Raul Torres
Program Administrator: Michele Parsons

Integrated Physiology

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

Microbiology

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

Molecular Biology

Program Director: Dr. Robert Sclafani
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: Elizabeth Wethington

CU BOULDER CAMPUS

Chemical & Biological Engineering

Program Director: Dr. Kristi Anseth

Graduate Advisor/MSTP Liaison: Dr. Kristi Anseth

Program Administrator: Dominique de Vangel

Chemistry and Biochemistry

Department Chair: Dr. Natalie Ahn

Graduate Advisor: Dr. Robert Batey

MSTP Liaison: Dr. Roy Parker

Program Administrator: Pamela Williamson

Mechanical Engineering

Department Chair: Dr. Michael Hannigan

Graduate Advisor/MSTP Liaison: Dr. Mark Rentschler

Program Administrator:

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 Neuroscience

T32 Cancer Biology

T32 Molecular Biology

T32 Pharmacology

T32 Immunology

T32 Ageing

T32 Head and Neck Cancer

T32 Pediatric Hematology & Oncology

T32 Rheumatology & Immunology

List of T32 Predoctoral Programs (CU Boulder)

MSTP Steering Committee Membership: 2017 - 2018

Arthur Gutierrez-Hartmann, MD

Jorge DiPaola, MD

Patricia Ernst, MD

Matt Taylor, MD/PhD

Bruce Appel, PhD

Andy Bradford, PhD

Lee Niswander, PhD

Medicine, Biochemistry & Molecular Genetics (MOLB, CANB, REPS)

Pediatrics (CANB, HMGGP, MOLB)

Pediatrics (MOLB, PHCL)

Medicine (HMGGP, NRSC)

Pediatrics (CSDV, NRSC)

Ob/Gyn (CANB, IPHY, MOLB)

Pediatrics (CSDV, HMGGP, NRSC)

David Port, PhD	Medicine, Pharmacology (PHCL)
Mary Reyland, PhD	Pathology, Cell and Developmental Biology (CANB, MOLB)
Rytis Prekeris	Biochemistry & Molecular Genetics (CANB, HMGGP, 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	Neuroscience (NRSC)
Student Members	

**Some Extramural 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),

[\(http://www.niams.nih.gov/\)](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/MARCPreddoctoral.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

Predocotrual(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 Predocotrual 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 DESSCRIPTION: ROTATION 1 2 3 (circle)

Student Name: _____

Research Advisor: _____

Rotation Title: _____

INTRODUCTION:

BACKGROUND:

SPECIFIC EXPERIMENTAL AIMS:

METHODS AND DESIGN:

RESULTS: