



Medical Scientist Training Program

Combined M.D. / Ph.D. Degree Program



University of Colorado
Denver, Colorado

**Student Handbook
2009 - 2010**

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Expectations of MST Program Students

The key expectation of each student admitted into the UC Denver Medical Scientist Training Program is that they take full advantage of all UC Denver resources and couple that with personal responsibility to achieve optimal success. 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, students must 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 encouraged to first complete one to two clinical rotations and then students must begin thesis research and successfully pass the Comprehensive Exam. During this year, students will help organize the National MD/PhD 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. A student's success at this stage of training and in subsequent steps will depend on the student's own drive, initiation 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 success!

Expectations for PhD Training

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

1. A student must be self-motivated. Motivation should come from within and not determined by the mentor or arbitrary deadlines.
2. A student should work the necessary hours in the lab to complete their 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.

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 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

*Adapted from: AAMC and NBME report -Embedding Professionalism in Medical Education; http://www.nbme.org/PDF/NBME_AAMC_ProfessReport.pdf

General Information

Welcome to the Medical Scientist Training Program

At the University of Colorado School of Medicine and Graduate School, the MST Program is a seven to eight year program for 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 – 2 clinical rotations, 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 Dr. Angie Ribera and by members of the MST Program Steering and Executive Committees. In addition, there are two student representatives who serve on the Steering Committee. The program's subcommittees and their current chairs are:

Student Advisory: **Arthur Gutierrez-Hartmann, M.D.** and **Angie Ribera, Ph.D.**

Clinical Transition: **Matthew Taylor, M.D., Ph.D.**

Faculty Credentials: **Michael Vasil, Ph.D.**

Seminar/Evaluation: **Angie Ribera, Ph.D.**

Admissions Committee: **David Jones, Ph.D.**

MD/PhD Student Conference: third year MST Program students and selected faculty advisor

Program Information

University of Colorado Denver at Anschutz Medical Campus/ MST Program

Program Director: **Dr. Arthur Gutierrez Hartmann** (a.gutierrez-hartmann@ucdenver.edu)

Program Associate Director: **Dr. Angeles Ribera** (angie.ribera@ucdenver.edu)

Program Administrator: **Jodi Cropper** (jodi.cropper@ucdenver.edu)

Program Administrative Assistant: **Pat Goggans** (patricia.goggans@ucdenver.edu)

Anschutz Medical Campus (AMC)
Academic Office One
Room 2601
(303) 724-4600
(303) 724-2920 (FAX)

Mailing Address:
UC Denver MSTP/Mail Stop B 176
Academic Office One/ Room 2601
12631 East 17th Ave.
PO Box 6511
Aurora, CO 80045

Program Faculty

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

<http://www.uchsc.edu/som/mstp/faculty.html>

New Student Information

The successful applicant to the MST Program enters the University of Colorado Denver 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. Over the summer, students will receive several communications regarding Student Orientation Week over the summer. 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 (this is in addition to the transcripts requested by the Medical School)
- Final Transcript from degree-granting institution, documenting receipt of the undergraduate degree
- Colorado Residency Form

Student Support

Accepted students receive full funding, including a stipend (currently \$25,000/year), tuition and fees for the entire period of study. Continued support is contingent upon satisfactory academic and research 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 Student Grants/Individual Funding Section for agencies that support MD/PhD students. The student returns to MST Program support upon defending a thesis and returning to medical school.

New Student Paperwork: Payroll

Before students can receive their stipend, they must fill out the appropriate paperwork with the MST Program and the UC Denver Payroll Department. PLEASE NOTE: An original copy of one's 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 Payroll 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). **Appropriate taxes will NOT be withheld from student's pay. It is the STUDENT'S responsibility to pay their taxes.** Students should consult with a tax professional and the IRS website (<http://www.irs.gov/individuals/students/index.html>) to learn about their options.

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 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 (www.uchsc.edu/studentinsurance) 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 LaVerne Loechel at Student Health Services, (303) 724-7674.

ID Cards

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 building access after hours and weekends. UCD at AMC ID cards are issued for no longer than 4 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 National Jewish or UC Boulder.

Tuition Bills

The MTSP 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 Bursars Office to the MST Program Office.

Parking

Students intending on driving to the Anschutz Medical Campus must contact the Parking Office at (303) 724-1584 (<http://www.uchsc.edu/facilities/parking/>) 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 at the Anschutz Medical Campus.

New Student Orientation

During the week 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.

Establishing Colorado Residency

All out-of-state students are required to petition for In-State Tuition Classification (the petition form: <http://www.uchsc.edu/registrar/instate.pdf>). 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 upon his or her arrival in Colorado. The following must be completed no later than July 1st after the student's MSI year in order to qualify for in-state residency status for the next academic year.

1. Register one's automobile with the State of Colorado.
2. Obtain a State of Colorado driver's license.
3. Register to vote.
4. Obtain a lease agreement or proof of homeownership with the student's name on the document

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

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 the formal course held during the fall semester. Each student then chooses a program-specific elective in the spring semester.

All entering medical/MST Program students are paired with a clinical 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.

Students interested in taking a summer elective must receive approval from the Director or Associate Director prior to registering for the course.

MST Program Seminar

Students in the first two years attend a weekly MST Program seminar 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 students 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. I **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

All MST Program students are required to submit all of their grades to the Administrator. This includes final grades, all course work, 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.

MSI and MSII students are required to pick **two** Medical School courses to take for Graduate School credit and receive a letter grade instead of Honors/Pass/Fail. This allows students to complete their comprehensive exam for their PhD at the required time.

Student Assistance

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 a strict timetable.

Change of Address

To change one's address in the Student Information System (SIS) go to <http://www.uchsc.edu/student>. Follow the "Services for Students" link and then the "Web Registration & Records". Enter the student ID number and the 4-digit PIN. Proceed to the screen for Address/PIN changes.

Students must notify the MST Program Administrator of any address change information by letter or email in order to update Human Resources for payroll purposes.

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).

MST Program Promotion and Recruitment

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 into the Graduate School. The MST Program will pay for the Program copy.

Participation in Recruitment Functions

Between November and March of each year, prospective student applicants visit the UC Denver 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 UC Denver 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. Student's efforts will pay dividends by generating a vital, outstanding Program.

Annual MD/PhD Student Keystone Conference

UC Denver MST Program students organize the Keystone Conference during their first laboratory year (typically a student's 3rd year in the MST Program). The MST Program covers registration and meeting costs for UC Denver students. However, once UC Denver students register for the Keystone conference, they are required to attend, as expenses can not 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 UC Denver MST Program students to attend the conference. In addition, MSTP students must attend a minimum of 2 conferences between the summer before MSI, summer after MSI, and summer after MSII. UC Denver MST Program students in their thesis 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.

Meeting Support

In addition to paying for each student to attend the MD, PhD student conference in Keystone, CO each year, the UC Denver MST Program will support each student with \$300 to help cover the cost of outside courses, course fees, a research meeting, etc. This support will be provided for each student once during his/her training.

Vacations

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

MSI students receive a week-long winter break vacation after Clinical Interlude. MSI students also receive one week spring break vacation in March along with the Medical Students. Unfortunately, the medical school and graduate school may not schedule the same week for spring break. Please make arrangements early to take vacation. It is likely that missed graduate school commitments will be less than missed medical school commitments.

Scheduling USMLE STEP I

The deadline for MSII students to take USMLE Step I is the same as for all SOM MSII students, April 9, 2010. Further, similar to SOM students, after taking STEP I, MST Program students start their next laboratory or clinical rotation on April 12, 2010. Thus, each student makes his/her own decision about when to schedule STEP I and how much vacation time to allow before April 12, 2010. Students must receive permission from the Director and/or the Associate Director if they are unable to meet this deadline.

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.

Resources Available to MST Program Students

- Program-owned digital camera
Available for check-out
- Program-owned LCD projector
Available for check-out
- Books and MST Program Student Theses
Available for check-out
- Computer/Color Printer in 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

Medical School Phase I (MSI)

Course Book

The 2009-2010 UCD Course Book can be downloaded at:

<http://www.uchsc.edu/registrar/coursebook/>

Registration

First and second year MST Program students will automatically be registered for the core MST Program curriculum. For a complete list of courses and explanations regarding resolutions for logistical conflict between the graduate and medical school curricula, please see the Appendix. The Student Advisor, Dr. Angie Ribera, must approve students taking any Medical School and/or Graduate School elective during the first two years. Students may pre-register for electives by using the web registration during the designated times. They must then go to the Registrar's Office during the first two weeks of the semester to obtain a Drop/Add Form that is to be signed by the Program Director and Administrator. Students requesting an exception to the normal MST Program core curriculum must have approval from Drs. Arthur Gutierrez-Hartmann and Maureen Garrity, Associate Dean of Student Affairs.

Students are coded as graduate students the first two years of the Program and during the research years. 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.

During MSI and MSII years, the MST Program Curriculum is demanding and challenging. Focusing on the required coursework takes up a substantial amount of time. To allow for balance and down-time, the MST Program requests that students not take other medical school electives or volunteer in clinics during MSI, MSII or thesis research years. If you desire to take an elective, please discuss this with the MST Program.

In order to have enough Graduate School credits to take the comprehensive exam early 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.

MSI 2009 - 2010 Curriculum

FALL SEMESTER 2009

IDPT 5000	Foundations Doctoring I	2.0 crs
IDPT 5001	Human Body	7.0 crs
IDPT 5015	Basic Cardiac Life Support	0.5 crs
IDPT 5090	Mentored Scholarship	1.0 crs
IDPT 7645	MSTP Seminar	1.0 crs Letter Grade
IDPT 7811	Biomedical Sciences Core Course I	2.0 crs Letter Grade
IDPT 7812	Biomedical Sciences Core Course II	2.5 crs Letter Grade
IDPT 7813	Biomedical Sciences Core Course III	2.5 crs Letter Grade
IDPT 7814	Biomedical Sciences Core Course IV	1.5 crs Letter Grade
IDPT 7815	Biomedical Sciences Core Course V	1.5 crs Letter Grade
IDPT 7805	STDIES: Molecules/Medicine	<u>3.2 crs</u> Letter Grade
	Total Credits	24.7 crs

SPRING SEMESTER 2010

IDPT 5000	Foundations of Doctoring I	2.0 crs
IDPT 5003	Blood and Lymph	4.0 crs
IDPT 5004	Disease and Defense	5.0 crs
IDPT 5005	Cardiovascular/Pul/Renal	9.5 crs
IDPT 5090	Mentored Scholarship	1.0 crs
IDPT 7645	MSTP Seminar	1.0 crs Letter Grade
PRMD 5000	Ethics Hlth Professions I	1.0 crs
<u>XXX</u> XXX	Graduate School Elective	___crs
	Total Credits	(depends on elective)

Graduate School Preliminary Examination

In most cases, students take a two part Preliminary Exam with the first part focusing on key concepts of the Core course and the second part focusing on the elective taken in the winter and/or spring quarters.

Each Program requires its own preliminary examination, which constitutes the second part of the two part Preliminary Examination. However, there is significant flexibility, and completing the exam in one area is typically accepted by most other Graduate Programs. The means by which each Program makes this evaluation will be specified in the Program's literature. The Preliminary Examination requirements vary in each of the basic science Ph.D. Programs. The specifics for each degree are addressed within each Department. Students who are thus evaluated will be notified immediately of the results once they are available. The results of this preliminary examination will be reported to the Graduate School Office on the Application for Candidacy form, which must be filed at least two weeks prior to the comprehensive examination.

Summer Research Rotations

The choice of a research advisor and project 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 help to shape the rotation experience.

Students begin their first required summer rotation after completion of the first year curriculum. Students complete a second laboratory rotation after their second year, typically after completing 1-2 third year clinical rotations. 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 MSTP 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 will 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.

During the spring semester, 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 Program Director and/or Associate Director and the Advisor of the appropriate Graduate Program. Students are allowed to enter thesis laboratories of MST Program Training Faculty only. If a faculty is not a member, the student must obtain prior approval from the Director or Associate Director to perform a lab rotation in that lab.

Students begin their first required summer rotation after completion of the Graduate School preliminary examination, and must begin no later than **June 14, 2010** for MSIs and **April 12, 2010** for MSIIIs. This first rotation is about 8 weeks in length, and at the end of the rotation students present their results as a post-rotation seminar in the fall in the weekly MSTP Seminar course.

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.

Medical School Phase II (MSII)

In the second year, the MST Program students complete the medical school pre-clinical course requirements and take the USMLE Step 1 exam 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. The National Board of Medical Examiners (NBME) is currently evaluating the structure of board examination. Any changes that will affect MST Program students will be discussed as they arise.

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, 1 - 2 laboratory rotations and taken the Medical School Ethics Courses.

MSII 2009 - 2010 Curriculum

FALL SEMESTER 2009

IDPT 6000	Foundations Doctoring II	1.6 crs.
IDPT 6001	Nervous System	7.5 crs.
IDPT 6002	Digest/Endo/Metaboli Sys	9.5 crs.
IDPT 6090	Mentored Scholarship	0.6 crs
IDPT 7645	MSTP Seminar	1.0 crs Letter Grade
PRMD 6000	Ethics Hlth Professions 2	<u>0.7 crs.</u>
	Total Credits	20.9

SPRING SEMESTER 2010

IDPT 6000	Foundations Doctoring II	1.6 crs.
IDPT 6003	Life Cycle	5.0 crs.
IDPT 6004	Infectious Disease	4.5 crs.
IDPT 6015	BCLS Update	0.3 crs.
IDPT 7645	MSTP Seminar	1.0 crs Letter Grade
IDPT 6090	Mentored Scholarship	<u>0.6 crs.</u>
	Total Credits	13.0

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 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. MST Program students must take the Step I exam according to the Medical School Requirements, prior to the start of the MSIII year (April 12, 2009).

MSII students must complete the BLS certification course along with the other MSII students transitioning to MSIII. Please also update your HIPAA and PPD paperwork and turn in the required documentation to the MSTP office.

Clinical Rotations

Since MSII ends in April, UC Denver MST Program strongly advises MST Program students to complete one to two core MSIII clinical rotations 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 in July, August or September, after their second research rotation and after completing 1-2 core MSIII clinical rotations. Students must join a PhD lab by September (fall) of their 3rd year in the MST Program. 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 Angie Ribera.

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 Ms. Fran Osterberg ((303) 724-2914) in the Graduate School (AO1, Room 2609) for information on this process. Be aware that there may be some expenses during this process that may require some time for reimbursement.

In the beginning of the third year, the student formally chooses a laboratory for graduate work and 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. **Students must enroll in the Research Ethics course offered during their first year in the lab** (the Ethics course offered in Boulder and the Immunology Program will meet this requirement). Students must submit final copies of annual/biannual Thesis Committee Meeting Reports to the MST Program Office (mail stop B176). **It is the student's responsibility to ensure that the copies are received in a timely manner.**

Yearly meetings are scheduled with the Associate Director 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 Director and Administrator. Moreover, thesis year students are encouraged and expected to contact the MST Program Director and/or Associate Director whenever there are issues that they would like to discuss or about which they seek advice.

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 their 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.uchsc.edu/gs/gs/handbook>. The handbook outlines all general information pertaining to the Graduate Program at the University of Colorado Denver. Information specific to student's degree-granting Program can be obtained from student's Graduate Program Administrator, Graduate Training Advisor, or on the Graduate Program website.

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 UC Denver faculty and the CU Boulder faculty and must meet the following rigorous criteria:

- They must be engaged in an independent, active, and funded research.
- They 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 a 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 table at the beginning of this handbook for a complete list of all current MST Program training faculty.

Registration

During the research years, students must register 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 who do not register by the end of the first two weeks of a semester will be assessed a late fee.

Course registration is available on-line. To access the web registration and other services go to <https://hydra.cusys.edu/pinnacle/cgi-bin/sisget.cgi/hs/awssgnsn/>.

- Enter student ID
- Enter 4-digit Personal Identification Number (PIN)

After this screen (Student Sign-on Page) the menus are at the bottom of the screen and students must use the “submit” button rather than using the “enter” key.

Registration Status – review current eligibility to register status
Classification for the term – residency status, current class, college, major
Course Status – check the availability status of course prior to registration
Student Schedule – review current schedule of classes
Register – begin registration process

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 2 classes or 5 - 6 hours in work numbered 5000 or above, at least 8 hours, a combination of graduate/professional course work acceptable for graduate credit or any number of thesis hours. (Please refer to the Graduate School Handbook).

Foundations of Doctoring Thesis Year Course

Between the basic science and clinical years, while doing their PhD thesis research, MSTP students are required to enroll in a 1 day-per-month, MSTP-specific Thesis Years - Foundations of Doctoring Course (IDPT 7655) to continue their clinical training during the thesis years. The 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. By registering for this course, MSTP students acquire the usual liability protection provided to all medical students. **UC Denver MSTP students are required to enroll in the FOD Thesis Year Course (IDPT 7655) for 2 of the 3 semesters per year (fall, spring, or summer).**

Students must annually update their HIPAA and PPD certifications and turn in the necessary forms to the MSTP office. Students must also update their BLS certification every other year. **It is the student's responsibility to ensure their documentation is current.**

Comprehensive Examination

The Comprehensive Exam (comps) 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 comps the fall of the 3rd program year. MST Program students usually have cumulated the 45 hours of required coursework about 9 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 course work completed. Please refer to the Graduate School Handbook for more detailed information. In most Programs, the comprehensive exam consists of a 2 page, NIH-style grant proposal, typically focused on the student's proposed thesis questions. If an MSTP student fails the Comprehensive Exam, he/she will be dismissed from the Program and will then have to petition the SOM Associate Dean of Students and the SOM Medical Student Promotions Committee to return to Medical School.

Thesis Committee Meetings

UC Denver MST Program students must select a member of the UCD MSTP Steering Committee to join their thesis committee. Students must schedule one thesis committee meeting per year, but two per year are preferred. A thesis advisory committee meeting summary must be completed by the chair of the committee after each committee meeting. Once the chair of the 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 MD/PhD students. UC Denver MSTP 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 must be written upon a subject approved by student's major Program. To be acceptable, this dissertation should be a worthwhile contribution to knowledge in 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 the final draft of the thesis be approved by the Mentor and the Chair of the Thesis Committee before allowing a date for the formal defense to be scheduled. All dissertations must comply with the specifications of the Graduate School. Students should pick up the "Thesis Specification" handbook at the Graduate School Office. The Graduate School also conducts a Thesis Seminar twice a year in October and March, to assist student in completing their thesis. Notification of the date of the seminar will be posted in Departmental offices.

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 much longer than anticipated. Keep a sense of urgency to finish it well in advance of deadlines. Students should refer to the attached timeline to get a reference on the sequence of events for return to Medical School.

Return to Clinical Years Survey

In November/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 coming 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.

MSIII and MSIV (Clinical Years)

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. Matthew Taylor, Chair of the Clinical Transition Committee. Dr. Taylor 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. Taylor is as follows:

Telephone: 303-724-1400

Pager: 303-266-3164

Email: matthew.taylor@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. Meetings will be scheduled throughout the year to keep students up-to-date on the return to Medical School process and give timelines as guides for allowing adequate time for the completion of all steps necessary for their return.

An appointment should also be made with Dr. Maureen Garrity, Associate Dean of Medical Student Affairs. Dr. Garrity will discuss the third and fourth year curriculum and begin work on a schedule for those years. Please call (303) 724-6402 or email at maureen.garrity@ucdenver.edu.

Students ID Badges are valid for 4 years, so students who do not renew their ID during thesis years will need to request a new ID before returning to clinics.

Immunization Requirements

The following immunizations should be part of student's medical records, as proof of immunizations needed at time of matriculation. Students will need to contact the Medical Records Release of Information Office (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: 2 series
- Polio: childhood set of 4 series
- Varicella: evidence of date of illness, positive titer, or 2 shots one month apart for negative titer
- Hepatitis B series: 3 shot series at 4 and 8 week intervals. If more than one year lapsed between first and third shot, students will need a titer
- Tetanus: good for 10 years
- PPD: annual administration. If it has been more than 1 year since last PPD, students are required to have the 2 step method of testing done.

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. Students are considered for membership in this honor society during the last part of their junior year and again in the late summer of their senior year. 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 if they wish to be considered.

Elective Credit for Thesis Work

Students may petition the School of Medicine requesting that doctoral thesis credit already received be applied towards the School of Medicine graduation requirement of 28 weeks of 8000 level courses. The Program Director and/or the Chair of the Clinical Transition Committee must sign the petition. The signed petition must then be presented to and approved by the Associate Dean for Student Affairs. Credit will not be provided for those students simply seeking extended vacation time.

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 undergird the safe and competent practice of medicine. The USMLE Step II examination is usually taken early in the fall of the senior year. The School of Medicine requires a passing score on USMLE Step II as a requirement for graduation.

MST Program Alumni

Mailing List

University of Colorado MSTP graduates are required to submit 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 MSTP to track publications and positions of current and past students, so graduates of the UC Denver MST Program 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 assure overall success as an investigator in academic medicine.

Appendix

Course Descriptions: First Year MST Program Curriculum

Fall Semester

IDPT 5000 Foundations of Doctoring I 1.6 cr. Course Director, Dr. Wendy Madigosky, M.D. and Course Coordinator, Tina Roquemore, (303) 724-6421

The course is designed to expose students to basic clinical skills necessary for physicians. The course includes a weekly preceptorship along with instruction in physical exam, communication skills and professionalism.

IDPT 5001 Human Body 7.0 cr. Co-Course Directors, Drs. Michael Carry, Ph.D. (303) 724-2411 and Michael Kelly, M.D., 303- 724-2066

This course covers the anatomy and embryology of the back, extremities, trunk, head and neck. Students will dissect human cadavers, and study computer generated cross-sections and radiological images. Clinical case discussions will be integrated with the physical exam material.

The schedule for seven of the dissection sessions conflicts with that of the Graduate Core Course. The plan for how to deal with these conflicts will be discussed in detail at the August 8 orientation. In brief, for six of the seven conflicts students will attend the Graduate Core Course and have an alternate plan for dissections. However, for one of the sessions in conflict, students will attend dissection and watch a videotape of the missed Core class later that same day, so that students will not be behind on Core lectures by the time of the next class.

IDPT 5015 Basic Cardiac Life Support 0.3 cr. Course Director, Dr. Todd Larabee, M.D. (303) 372-5500 and Course Coordinator, Cathy Maciel, 303-372-5500.

Course will be taught, utilizing a lecture, demonstrations on mannequins and a practice session. This course is conducted on a Saturday in the fall. Students must read a required text before the course begins, pass a written examination and demonstrate near perfect performance skills essential to BCLS.

Please note that during student's thesis years, students will have to take this course in order to be able to take the Thesis Year FDC Course.

IDPT 7645 MST Program Seminar 1.0 cr. Co-Course Directors, Drs. Arthur Gutierrez-Hartmann, M.D. 303-724-3921 and Angie Ribera, PhD. 303-724-4517.

Designed to expose MST Program and physician scientist students to research programs and opportunities in biomedical sciences and prepare students for the challenges of the dual degree program and career. Attendance is required.

IDPT 7811 Biomedical Sciences Core Course I Fall Semester 2 cr.

Course Director, Mair Churchill, 303-724-3670

Building blocks and guiding biophysical principles.

IDPT 7812 Biomedical Sciences Core Course II Fall Semester 2.5 cr.
Course Director, Richard Davis, 303-724-3226
Generating the blocks: Replication, transcription and translation. Continuation of Core Course IDPT 7811.

IDPT 7813 Biomedical Sciences Core Course III Fall Sem. 2.5 cr.
Course Director, Robert Evans, 303-724-4306
Building a Cell: Cell structure and function. Continuation of Core Course IDPT 7812.

IDPT 7814 Biomedical Sciences Core Course IV Fall Sem. 1.5 cr.
Course Director, Andy Bradford, 303-724-3507
How does it Function: Cell signaling. Continuation of Core Course IDPT 7813.

IDPT 7815 Biomedical Sciences Core Course V Fall Sem. 1.5 cr.
Course Director, Kristin Artinger, 303-724-4562
From Development to Function: How to build an organism. Continuation of Core Course IDPT 7814.

IDPT 7805 Molecules to Medicine 3.2 cr.
Co-Course Directors, Drs. Arthur Gutierrez-Hartmann, M.D. 303-724-3921 and Angie Ribera, PhD. 303-724-4517.
Molecules to medicine is an integrated approach to cell biology, biochemistry, molecular biology and human genetics presented in a context that emphasizes clinical issues. Attendance is required.

Spring Semester

IDPT 5000 Foundations of Doctoring I 1.6 cr.
Course is a continuation of the fall semester course.

IDPT 5003 Blood and Lymph 4.0 crs. Co-Course Directors, Drs. Tim Garrington, M.D. 303-764-8365 and Jill Slansky, Ph.D. 303-398-1887.
Blood and Lymph covers the basic and clinical concepts underlying immunology, hematology, rheumatology and malignancies of the blood. Histology, genetics, biochemistry, and ethical issues are integrated into the relevant course concepts. Contact hours are divided equally between lecture and discussion groups.

IDPT 5004 Disease and Defense 5.0 crs. Co-Course Directors, Drs. Ronald E. Gill, Ph.D. 303-724-4230 and Marsha Anderson, M.D. 303-861-6877.
Course material covers principles of biometrics, pharmacology, pathology and infectious disease. Topics include mechanisms of tissue damage and repair. Dermatology is presented as an “Organ System”, including structural and function of skin, pathology, pathophysiology and pharmacology.

IDPT 5005 Cardiovascular/Pulmonary/Renal 9.5 crs. Co-Course Directors, Drs. Bruce Wallace, Ph.D 303-724-4532 and John Weil, M.D. 303-315-4471.

Course is an interdisciplinary approach to the cardiovascular, pulmonary and renal system, including anatomy, histology, physiology, pathophysiology, pathology, pharmacology, and development. Emphasis is on how major organs work together to regulate blood pressure and fluid, electrolyte, and acid-base balance.

IDPT 7645 MST Program Seminar 1.0 cr. Co-Course Directors, Drs. Arthur Gutierrez-Hartmann, M.D. 303-724-3921 and Angie Ribera, PhD. 303-724-4517.

Designed to expose MST Program and physician scientist students to research programs and opportunities in biomedical sciences and prepare students for the challenges of the dual degree program and career. Attendance is required.

PRMD 5000 Ethics in the Health Professions I Course Director, Dr. Jackie Glover, Ph.D. 303-724-3992.

Required two-part course in ethics taught with dental, medical, nursing, pharmacy, physical therapy and physician assistant students. This course includes basic knowledge and skills in ethical theory and reasoning, professional ethics, and inter-professional approaches to health care decision making.

Depending upon which spring elective students choose, there may be schedule conflicts with PRMD 5000. In this event, the MST Program will work with Dr. Jackie Glover and the Director of the student's Graduate School Elective to develop a solution to the schedule conflict.

Course Descriptions: Second Year MST Program Curriculum

Fall Semester

IDPT 6000 Foundations of Doctoring II 1.6 cr. Course Director, Dr. Wendy Madigosky, M.D., (303) 724-6420 and Asst. Course Director, Tina Roquemore, (303) 724-6421.

This course is the second year of a longitudinal Foundations curriculum. Students spend one afternoon each week off campus with a generalist physician or on campus learning communications or physical exam skills. Course limited to second year medical students.

IDPT 6001 Nervous System 7.5 cr. Co-Course Directors, Drs. Tom French, Ph.D. 303-724-3387 and Steven Ojemann, M.D. (303) 724-2285

Course covers the gross and microscopic anatomy of the nervous system, basic neurobiology and neurophysiology, pharmacology, neuropathology, and basic neurologic and psychiatric examination skills. Emphasis is on the relationship between basic processes and functional systems to clinical phenomena and behavior.

IDPT 6002 Digestive, Endocrine, and Metabolic Systems 9.5 cr. Co-Course Directors, Drs. Robin Michaels, Ph.D. (303) 724-3402, Virginia Sarapura, M.D. (303) 724-3931 and Daniel Bessesen, M.D. (303) 315-9005

This interdisciplinary course integrates clinical and basic science topics related to the normal function and diseases of the gastrointestinal and endocrine systems. The biochemistry and physiology of nutrient metabolism in health and disease will also be covered.

IDPT 7645 MST Program Seminar 1.0 cr. Co-Course Directors, Drs. Arthur Gutierrez-Hartmann, M.D. (303) 724-3921 and Angie Ribera, PhD. (303) 724-4517.

Designed to expose MST Program and physician scientist students to research programs and opportunities in biomedical sciences and prepare students for the challenges of the dual degree program and career. Attendance is required.

PRMD 6000 Ethics in the Health Professions II 0.7 cr. Course Director, Dr. Jackie Glover, Ph.D. (303) 724-3992

Required two-part course in ethics taught with dental, medical, nursing, pharmacy, physical therapy and physician assistant students. This course includes basic knowledge and skills in ethical theory and reasoning, professional ethics, and inter-professional approaches to health care decision making.

Spring Semester

IDPT 6000 Foundations of Doctoring II 1.6 cr.
Course is a continuation of the fall semester course.

IDPT 6003 Life Cycle 5.0 cr. Co-Course Directors, Drs. Robert Shikes, M.D. (303) 724-3704 and Sonya Erickson, M.D. (303) 724-2034

Course provides an interdisciplinary approach to the normal biology and pathobiology of the male and female reproductive systems, reproduction and pregnancy, the fetus, newborn and child, aging, and end of life. Clinical cases and physical examination will be integrated throughout.

IDPT 6004 Infectious Disease 4.5 cr. Co-Course Directors, Drs. David Barton, Ph.D. (303) 724-4215 and Nancy Madinger, M.D. (303) 315-7233.

This course integrates microbiology, infectious diseases, and antimicrobial pharmacology. Content covers pathogenic microorganisms (bacteria, viruses, fungi and parasites), host-pathogen interactions, microbial virulence determinants, host immune responses, signs and symptoms of disease presentation, epidemiology, laboratory diagnosis, prevention (vaccines) and therapy (antimicrobials).

IDTP 6015 Basic Cardiac Life Support Update 0.3 cr. Course Director, Dr. Todd Larabee, M.D. (303) 372-5500 and Course Coordinator, Cathy Maciel (303) 372-5500. A re-certification. Principles of BCLS will be taught, utilizing lecture, demonstrations on mannequins, practice sessions. Course conducted on a Saturday in mid-Spring. Students must read required text prior to course, pass written examination and demonstrate near perfect performance skills essential to BCLS.

Please note that during student's thesis years, he/she will have to take this course in order to be able to take the Thesis Year FDC Course.

IDPT 7645 MST Program Seminar 1.0 cr. Co-Course Directors, Drs. Arthur Gutierrez-Hartmann, M.D. (303) 724-3921 and Angie Ribera, PhD. (303) 724-4517.

Designed to expose MST Program and physician scientist students to research programs and opportunities in biomedical sciences and prepare students for the challenges of the dual degree program and career. Attendance is required until MSII classes end in March 2009.

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.

UC Denver Programs

Biochemistry and Molecular Genetics

website: <http://www.uchsc.edu/sm/bbgn>
Program Director: Dr. Paul Megee
Graduate Advisor: Dr. Paul Megee
Program Administrator: Ms. Deanne Perez

Biomolecular Structure

website: <http://biomol.uchsc.edu>
Program Director: Dr. Robert Hodges
Graduate Advisor: Dr. Jeff Kieft
Program Administrator: Ms. Jackie Newnam

Cancer Biology

website: <http://www.uchsc.edu/expath/index.htm>
Program Director: Dr. Steve Nordeen
Graduate Advisor: Dr. Steve Nordeen
Program Administrator: Ms. Pamela Goens

Cell Biology, Stem Cells and Development

website: <http://www.uchsc.edu/cdb/>
Program Director: Dr. Linda Barlow
Graduate Advisor: Dr. Linda Barlow
Program Administrator: Ms. Carmel Harberg

Human Medical Genetics

website: <http://www.uchsc.edu/gs/gs/humedgen>
Program Director: Dr. Richard Spritz
Graduate Advisor: Dr. Richard Spritz
Program Administrator: Ms. MJ Stewart

Immunology

website: <http://www.uchsc.edu/sm/immuno/>
Program Director: Dr. Raul Torres
Graduate Advisor: Dr. Raul Torres
Program Administrator: Ms. Amy Scoby

Microbiology

website: <http://www.uchsc.edu/sm/microbio>
Program Director: Dr. Randall Holmes
Graduate Advisor: Dr. Jerry Schaack
Program Administrator: Mr. Tom Shallow

Molecular Biology

website: <http://www.uchsc.edu/molbio/>
Program Director: Dr. James DeGregori
Graduate Advisor: Dr. James DeGregori
Program Administrator: Ms. Jean Sibley

Neuroscience

website: <http://www.uchsc.edu/sm/neuroscience>
Program Director: Dr. Diego Restrepo
Graduate Advisor: Dr. Sukumar Vijayaraghavan
Program Administrator: Ms. Mellodee Phillips

Pharmacology

website: http://pharmacology.ucdenver.edu/gt/gt_overview.shtm
Program Director: Dr. J. David Port
Graduate Advisor: Dr. J. David Port
Administrator: Mr. James Finster

Physiology and Biophysics

website: <http://www.uchsc.edu/physiology/gradpgm.htm>
Program Director: Dr. William Betz
Graduate Advisor: Dr. Sukumar Vijayaraghavan
Program Administrator: Ms. Anisha Phillips-Thomas

Reproductive Sciences

website: <http://www.uchsc.edu/reproductive-sciences/>
Program Director: Dr. Andy Bradford
Graduate Advisor: Dr. Andy Bradford
Program Administrator: Ms. Barb Morgan

CU Boulder Programs

Chemistry and Biochemistry

website: <http://www.colorado.edu/Chemistry/>

Department Chair: Dr. Arthur Pardi

Graduate Advisor: Dr. Natalie Ahn

Program Administrator: Ms. Maia Whitaker

Molecular, Cellular & Developmental Biology

website: <http://mcdb.colorado.edu/>

Program Director: Dr. Thomas Blumenthal

Graduate Advisor: Drs. Min Han (MSTP) and Mark Winey

Program Administrator: Ms. Karen Brown

Biomedical Engineering

website: <http://www.colorado.edu/che/>

Program Director: Dr. Kristi Anseth

Graduate Advisor: Dr. Kristi Anseth

Student Services: Ms. Frannie Ray-Earl

MSTP Steering Committee Membership: 2009 - 2010

Arthur Gutierrez-Hartmann, M.D.

Natalie Ahn, Ph.D.

Kristi Anseth, Ph.D.

Linda Barlow, Ph.D.

Andrew Bradford, Ph.D.

Min Han, Ph.D.

Lee Niswander, Ph.D.

Steven Nordeen, Ph.D.

David Port, Ph.D.

Angie Ribera, Ph.D.

Robert Sclafani, Ph.D.

Matthew Taylor, M.D., Ph.D.

Raul Torres, Ph.D.

Michael Vasil, Ph.D.

Jeff Kieft, Ph.D.

Program Director

Chemistry/Biochemistry – CU Boulder

CHEN/Biomedical Engineering – CU Boulder

Cell and Developmental Biology

Department of Obstetrics and Gynecology

Molecular, Cellular and Developmental Biology

Department of Pediatrics

Department of Pathology/Cancer Biology

Department of Medicine/Cardiology and

Pharmacology

MSTP Associate Director, Physiology and

Biophysics, Neuroscience

Biochemistry and Molecular Genetics

Department of Medicine

Integrated Department of Immunology

Microbiology Department

Keystone Faculty Advisor

MEDICAL SCIENTIST TRAINING PROGRAM

Summer Laboratory Rotation Evaluation 2009

Please Return to MST Program, Campus Box B176 or by email to jodi.cropper@ucdenver.edu

Student: _____

Date: _____

Advisor: _____, Ph.D.

Please rate on scale of **1-10 (1=worst and 10= outstanding)**. Please provide narrative as well as assigning a numeric rating.

1. Rate the student's passion and creativity in experimental science.
2. Rate student's ability to comprehend experimental questions, methods and interpretation of results.
3. Rate the student's overall professionalism (i.e., their responsibility, dependability, commitment and quality peer/professor interactions).
5. Have you discussed your evaluation and/or any concerns with the student?
6. Would you accept student in your lab for completion of dissertation studies? Have you discussed this decision with the student?

Advisor Signature: _____

RESEARCH ROTATION: Summer, 2009

Student Name: _____

Research Advisor: _____

Rotation Title:

INTRODUCTION:

BACKGROUND:

SPECIFIC EXPERIMENTAL AIMS:

METHODS AND DESIGN:

RESULTS:

CONCLUSIONS/FUTURE DIRECTIONS:

UNIVERSITY OF COLORADO DENVER
GRADUATE SCHOOL

REQUEST FOR TRANSFER FROM INTERDEPARTMENTAL PROGRAM TO
DEGREE-GRANTING PROGRAM

Student Name: _____

Student Number: _____

Interdepartmental Program from which student is transferring: **Medical Scientist**
Training Program

Degree-granting Program to which student is transferring: _____

Effective Term: _____

Approved (Required Signatures/in signature order)

Interdepartmental Program Director (*Arthur G-Hartmann, MD*) _____ Date

Degree-granting Program: Chair or Director _____ Date

Student Admissions and Records: Wayne Sell _____ Date

Graduate School: Fran Osterberg _____ Date

Distribution made by Graduate School:
Original to Graduate School Student File
Copy to Interdepartmental Program
Copy to Degree-granting Program
Copy to Office of Admissions and Records

MEDICAL SCHOOL APPROVAL TO RETURN:

The above named student has met the following requirements and has my permission to begin their third year clerkships.

Current BCLS Healthcare Providers certification _____
(must be good for two years once beginning third year)

Passing Score on Step I _____

Current Immunizations for third year
(Please see attached for specific requirements) _____

Completed Ph.D. _____

HIPPA Certification _____

Maureen Garrity, Ph.D., Associate Dean for Student Affairs

Date

Some Extramural Funding Sources that do not exclude MD/PhD Trainees

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

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

<http://grants1.nih.gov/grants/g;uide/pa-files/PA-99-089.html>

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

<http://granst1.nih.gov/grants/guide/pa-files/PA-01-132.html>

URM: Sponsored through the NIGMS. Contact persons include Drs. Adolphus Toliver and Anthony A. Rene (ra50h@nih.gov). website:

<http://www.nigms.nih.gov/funding/trngmech.html#predoc>

American Association of University Women

<http://www.aauw.org/> or <http://www.aauw.org/ef/specialawards.cfm>

American Cancer Society

http://www.cancer.org/docroot/RES/RES_5_1.asp?sitearea=RES

American Chemical Society, Division of Analytical Chemistry: Pfizer Graduate Travel Awards in Analytical Chemistry

http://www.acs-analytical.duq.edu/Pfizer_Award_Description.html

American Diabetes Association

www.diabetes.org or <http://www.diabetes.org/diabetes-research/research-grant-application-forms/ADA-grant-opportunities/ADA-current-grant-opportunities.jsp>

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/Education/index.asp?bid=6278>

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/>

Columbia University - list of internal and external funding opportunities

http://cpmcnet.columbia.edu/dept/neurobeh/nb_phd_fellowship.html

Community of Science Funding Opportunities Database

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

Cornell University Graduate Fellowship Notebook

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

Dept. of Defense, CDMRP – Breast and Prostate Cancer

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

Ford Foundation Dissertation Diversity Fellowships

<http://www7.nationalacademies.org/fordfellowships/forddiss.html>

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

www.pdsoros.org

Proposal Central

<https://v2.ramscompany.com/default.asp>

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.

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-07-106.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 Fellows (F30) <http://grants2.nih.gov/grants/guide/pa-files/PA-05-151.html>

Participating Organizations National Institutes of Health (NIH), (<http://www.nih.gov/>)
Components of Participating Organizations
National Institute on Aging (NIA/NIH), (<http://www.nia.nih.gov/>)
National Institute on Alcohol Abuse and Alcoholism (NIAAA/NIH), (<http://www.niaaa.nih.gov/>)
National Institute of Diabetes & Digestive & Kidney Disease (NIDDK/NIH), (<http://www2.niddk.nih.gov/>)
National Institute on Deafness and Other Communication Disorders (NIDCD/NIH), (<http://www.nidcd.nih.gov/>)
National Institute on Drug Abuse (NIDA/NIH), (<http://www.nida.nih.gov/>)
National Institute of Environmental Health Sciences (NIEHS/NIH), (<http://www.niehs.nih.gov/>)
National Institute of Mental Health (NIMH/NIH), (<http://www.nimh.nih.gov/>)
National Institute of Neurological Disorders and Stroke (NINDS/NIH), (<http://www.ninds.nih.gov/>)
Office of Dietary Supplements (ODS/NIH), (<http://ods.od.nih.gov/>)

Ruth L. Kirschstein NRSA Program for NIGMS MARC Predoctoral Fellowships (F31) (for minority groups underrepresented in the biomedical and behavioral sciences) <http://grants2.nih.gov/grants/guide/pa-files/PAR-03-114.html>
Sarnoff Cardiovascular Research Foundation Fellowship

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

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.