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UCD-AMC
Graduate Program in Cell Biology, Stem Cells and Development (CSD)

Student Handbook

2008 – 2009 Academic Year

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UCD-AMC
Graduate Program in Cell Biology, Stem Cells and Development (CSD)

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This handbook, does not constitute a contract with the University of Colorado Denver-Anschutz Medical Campus (UCD-AMC) Graduate School or the Cell Biology, Stem Cells and Development Graduate Program, either expressed or implied. The Cell Biology, Stem Cells and Development Graduate Program reserves the right at any time to change, delete, or add to any of the provisions at its sole discretion. Furthermore, the provisions of this document are designed by the Cell Biology, Stem Cells and Development Program to serve as firm guidelines rather than absolute rules, and exceptions may be made on the basis of extenuating circumstances.

I. Mission

The primary goal of the **Cell Biology, Stem Cells and Development (CSD)** Program is to train talented scientists in cell and developmental biology. The Program strives to attract outstanding students with the highest potential, and to provide them with quality training that stimulates independent and creative scientific thinking. Ultimately, helping students to develop their full potential in becoming independent investigators and leaders in biological science.

The Program's emphasis is on the definition and resolution of biological problems rather than the application of technologies. Thematically, the program is focused on cell, stem cells and developmental biology and offers a wide range of research opportunities. The nature of this program will best serve those students who are interested in developing independent research careers and who wish to pursue problems in biomedical science from an interdisciplinary perspective.

After the initial period of coursework, students choose their specialty fields from a diverse list of topics, and proceed with research until the generation and defense of a thesis leads to the award of a Ph.D. in Cell and Developmental Biology.

II. Graduate School Administration

The Graduate Program in Cell Biology, Stem Cells and Development (**CSD**) is part of the Graduate School of the University of Colorado, which is an equal opportunity institution. The Anschutz Medical Campus has its own Graduate School Division, which is under the leadership of John Freed, PhD, Dean; and Fran Osterberg, Assistant Dean.

The Graduate School of the Anschutz Medical Campus publishes the Graduate Student Handbook, which includes general information and rules concerning graduate students, as well as specific information on Honor Code and Grievance Procedures. This information applies to students in all programs. The purpose of this handbook is to relay additional information specific to the CSD program.

A. Student Support. At present, students accepted in the Ph.D. program are provided full tuition, health insurance, and a stipend of \$23,500 per year for living expenses (for the academic year 2007-2008). Continued support is contingent upon satisfactory academic and research performance by the student. When a student enters a thesis lab, the thesis mentor assumes complete responsibility for the student's stipend, tuition, fees, and associated research costs. In order to qualify for in-state tuition for the following year, **all out-of-state students must establish Colorado residency by the summer of the first year.**

B. Student Advising. During the first year, CSD students will meet with members of the Graduate Advisory Committee (GAC) on a rotating basis to discuss the student's progress in the CSD Program and any questions that may come up. Students will be expected and encouraged to seek advice from the GAC, Director, and/or other CSD faculty and student members prior to lab rotations, Comprehensive Examination, and any other situation requiring faculty consultation.

III. Program Components

Year 1: Coursework, Laboratory Rotations, and Preliminary examination

FALL SEMESTER – YR 1

IDPT 7801/7802/7803

Biomedical Sciences Course Core **10 units**

Course Director: Drs. Bob Murphy, Jim Hagman and Kathryn Howell

This section of the course covers structural, cellular and molecular biology.

PHCL 7605 **Ethics in Research** **1 unit**

Course Director: Dr. J. Stevens

Course is designed to introduce issues around ethics of research, publication, and reviewing of manuscripts and grants.

CSDV **Cells, Development, and Cancer Seminar** **No credit but required**

Course Director: Seminar Committee

Seminar series designed to present recent important findings in cell and developmental biology research. Different topics are presented weekly by CSD Training Program faculty, students and visiting faculty.

CSDV 7650 (1&2)

Laboratory Rotation sections 1 and 2:

1 unit each (2 total)

Coordinated by the GAC, Dr. Kristin Artinger, Chair.

Students will perform research in the laboratory of one of the members of the program. The rotation will be followed by an oral presentation.

SPRING SEMESTER – YR 1

You are required to take Developmental Biology and one elective course in the spring semester:

CSDV 7605 **Stem Cells and Development**

4 units

Course Director: Dr. David Clouthier

Course will cover topics in the development of the organism, such as cell birth, migration, differentiation, and death, in a variety of developmental systems. Part of the course is devoted to the discussion of original literature in the field.

Elective (required; for courses see below)

units vary by course selected

CSDV **Cells, Development, and Cancer Seminar**

No credit

Course Director: Seminar Committee

Seminar series designed to present recent important findings in cell and developmental biology research. Different topics are presented weekly by CSD Training Program faculty, students and visiting faculty.

CSDV 7650(1) **Laboratory Rotation section 3:**

1 unit

Coordinated by the GAC, Dr. Kristin Artinger, Chair.

Students will perform research in the laboratory of one of the members of the program. The rotation will be followed by an oral presentation.

SUMMER – YR 1

CSDV-7650 **Research in Cell and Developmental Biology** **0 unit**

Laboratory research with CSD Training Program faculty.

A. Laboratory Rotations in the First Year. Rotations serve several important purposes. First, they enable the student to explore and compare several areas of cell and developmental biology research and aid in the choice of a mentor and project for thesis work. Second, rotation seminars provide intense training in the craft and art of public presentation, an essential aspect of future career success. Third, they allow program faculty to evaluate the motivation and intellectual preparedness of students to undertake independent research. Students should discuss their interests with several potential faculty mentors, several weeks or more before the start of the rotation.

ROTATION SCHEDULE FOR 2008-2009:

Fall 1st: August 25-November 14

Fall 2nd: November 17-February 20

Spring: February 23-May 15

B. Number of Rotations. Students must perform 3 rotations before the start of their second year.

Students should start their first rotation in the fall semester. Students must complete 3 rotations in 3 separate laboratories in order to advance to their second year. Section 1 will start at the beginning of the fall semester and go through November. Section 2 will start in November and go through February and section 3 will start in March and go until the end of May. Official dates are set by the Graduate School. Optionally, students may start a rotation during the summer before formal entry into the Program. Medical Scientist Training Program (MSTP) students must complete two rotations (during the summers of the first and second year of Medical School).

C. Rotation Expectations. For professionals in training, it is not appropriate to require a minimum number of hours for rotation work. Strong self-motivation is an absolutely essential characteristic for an independent scientist, and we expect our students to demonstrate this quality throughout their training. In this regard, students should expect to be in the lab beyond the normal working hours, i.e. evenings, weekends, and possibly over vacation days during the term. This commitment of time is especially important when long, complex experiments are being done. A major part of the mentor's rotational assessment (as well as his/her willingness to accept a student) will be based on the degree and quality of lab effort. Students should always discuss time off and/or vacation days with their lab mentor in advance, both in their lab rotations and once they enter a thesis lab.

A short written evaluation of the student's rotation will be provided by the faculty mentor. Students are required to give an oral presentation of their rotation progress as well as submit a written report of laboratory work (1-2 pages; including hypothesis, necessary background, experiments performed, results obtained and conclusion). After completing these requirements, rotation grades will be assigned by the first year advisor in consultation with the rotation mentor, and discussed with the student.

D. Rotation Seminar. At the end of the rotation the student will present a seminar. The purpose of the seminar is to provide intense training in the craft and art of public presentation, an essential aspect of future career success. Each seminar should be 15 minutes in length. The student must rehearse the seminar with his or her rotation mentor prior to the public presentation. The seminar is an essential component of the research rotation. Students are expected to present a well-organized, clear, and thoughtful seminar. Students should consider the following elements when designing their presentation (although the order need not be strictly followed):

Introduction - a short statement of the question or problem addressed by the rotation, and the hypothesis to be tested.

Background - describe the significance of the question in broad terms for a diverse audience. Describe previous work and its relationship to the project.

Specific experimental aims - what were the particular experimental goals proposed to test the hypothesis?

Methods and Design - explain briefly any unusual strategies or techniques employed.

Results.

Conclusions and future directions.

Suggestions for Effective Seminars

1. Avoid reading or memorizing your presentation "word-for-word". Wooden, canned deliveries are dull and very hard for audiences to follow.

2. Prepare and use simple, effective visual aids. Remember that effective communication of data and ideas is your goal! Do not spend undue effort and expense on fancy multicolored slides (especially for text), if color is not required to simplify complex data or concepts. Colored visuals tend to require a darkened room and are often much harder to read than black on white line drawings or letters. Keep text very brief and do not read directly from the screen (audiences are much faster at reading silently!).
3. Use the marker board when appropriate. Diagramming or outlining while you are talking is a highly effective means of explaining concepts difficult to describe with the spoken word. Use of the marker board can also help answer spontaneous questions from the audience.
4. Consider audience questions carefully! Both faculty and students are encouraged to ask questions during and after rotation seminars. A few of these questions may be intended to probe your understanding of your research rather than illuminate an area of confusion. Part of your evaluation will concern your effectiveness in responding to questions. Thus, make sure that you understand the question before answering. Repeat the question or ask for a rephrasing if you need to. Second, relax and take a moment of silence if you must before answering to formulate a coherent answer. Third, if after contemplation you don't know the answer, don't be afraid to say so. We all get stumped from time to time!

E. Transfer to the Thesis Lab at End of First Year: An important aim of the rotations is to enable the student to obtain a thesis mentor. After the completion of the three rotations for regular graduate students or two rotations for MSTPs, the student must come to a mutual agreement with a faculty member to act as their thesis mentor. The chair of the GAC and the Program Administrator must be notified on the choice of mentor **on or before June 15th** of the first year. Official transfer to the thesis lab takes place on July 1st. Under exceptional circumstances and at the discretion of the GAC, a student may be allowed to perform an additional rotation during the summer following the first academic year, for the express purpose of enhancing the mentor selection process.

F. Preliminary Exam at the End of the First Year: Material covered in first year courses will be tested in an open note written examination. The exam consists of two parts, each tested on a different day. Part I (day 1) pertains to material covered in IDPT 7801/2/3 (cell and molecular biology) and Part II (day 2) deals with material covered in CSDV 7605 (developmental biology), and other elective course work taken in the 2nd semester of the First Year. The exam is coordinated with the Preliminary Exams of the other Graduate Programs in Molecular Biology, Biochemistry, Microbiology and Biomedical Sciences.

Students are required to answer 6 questions from Part I, and 4 questions from Part II, of which 2 must be from CSDV 7605. Each of the two exams will be graded on a scale from 0 to 100, and an overall grade will be calculated through a weighted average of Parts I and II. The student must obtain an overall grade of 70 or better to pass the preliminary exam, and pass 7 out of 10 questions with a score of 70 or higher on each day. Exact details will be given at the time of the exam.

YEAR 2: Coursework, Pre-Thesis Research and the Comprehensive Examination.

FALL – YR 2

CSDV-7650 **Research in Cell and Developmental Biology** **1-4 units**
Course Director: Dr. Linda Barlow (variable course units, Fall semester must total 5)
Laboratory research with CSD Training Program faculty.

Elective or Advanced Topics Course (see below) **variable units**
Course Director: Varies per semester
Course will focus on specific topics each semester.

SPRING – YR 2

CSDV-7650 **Research in Cell and Developmental Biology** **1-4 units**
Course Director: Dr. Linda Barlow
Laboratory research with CSD Training Program faculty.

Elective or Advanced Topics (see below) **variable units**
Course Director: Varies per semester
Course will focus on specific topics each semester.

SUMMER – YR 2

CSDV-7650 **Research in Cell and Developmental Biology** **1 unit**
Laboratory research with CSD Training Program faculty.

After the first year, one advance topic or elective class is required per academic year

Update talks: Beginning in the second year, each student is required to give an annual update presentation to the program. The first update should be before May 31 of the 2nd year, and should be scheduled with the program administrator at least one month in advance, although the presentation can be scheduled at any time during the year, i.e., earlier is better. We also recommend that you form a committee and have one pre-comprehensive exam meeting at the time of your first update seminar. Thus, to schedule a committee meeting, you will need to be sure all your members can attend, and coordinating faculty schedules can be challenging. Again, we want to emphasize that arranging this update is your responsibility, and urge you to make plans with your committee, and schedule your presentation with the program administrator well in advance.

A. Third year and advanced students

Third year students must **register for CSDV 8990 for 5 or more credits in both the fall and spring semesters and typically only 1 credit for the summer semester.** Each Fall semester, all students must complete the forms for insurance plan selection. Contact the Student Insurance Coordinator, 303-315-0800 with questions. These forms must be completed whether or not you plan to participate in a Student Health Insurance Plan.

B. Comprehensive Exam. At the beginning of the second year of study CSD graduate students will begin preparing for the Comprehensive Exam. It is highly recommended that the student carefully read

the Graduate Student Handbook on Comprehensive Examination policies and deadlines, and pick up a packet of instructions and forms from the Graduate School well ahead of the planned examination so all required paperwork can be completed on time. Completed paperwork must be submitted to the Graduate School no later than two weeks prior to the examination date. **Note:** A student must be registered at the time he/she takes the Comprehensive Examination.

Students must take the Graduate School Comprehensive Examination for admission to candidacy for the CSD Ph.D. by the **end of the summer of their second year but before January 1st of the third year**. Any deviation to this requirement must have approval from the PI, Graduate Advisory Committee, and the Program Director. The Comprehensive Examination Committee shall consist of a minimum of five Graduate Faculty members. At least one of the members must be outside the Program's core training faculty. The majority of the members, including the chair, must be from the core training faculty of the CSD Program. Students should contact members of the Graduate Faculty whom they wish to be on their committee, in consultation with the Director of the Program and their thesis advisor. Students should inform the committee members of their background, the topic of their thesis research and their preliminary results. In addition, the student arranges the time and location of the exam, and informs the members of the committee that the examination requires three hours. The student should provide the GAC with the names of the committee members.

The examination will have as its focus a thesis research proposal written by the student using the format of a NIH predoctoral fellowship. Although preliminary data collected by the student are helpful, it is not essential for the proposal. The written proposal must be distributed to the Comprehensive Exam Committee **at least two weeks prior** to the examination. The student must adequately demonstrate the scientific knowledge and ability to defend this proposal, as well as satisfying the overall requirements for the examination as set forth by the UCD-AMC Graduate Student Handbook. The examination will consist of a 30-45 minute seminar by the student, general questions from the audience and then detailed questions from the Thesis Committee. As stated in the graduate student handbook, the comprehensive examination "will test your mastery of a broad field of knowledge, not merely the formal course work completed." The student should consult with his or her committee members prior to the exam as to the subject areas each member expects the student to have mastered.

1. Written proposal

Listed below are **guidelines** for the proposal:

Title

Short Introduction and Specific Aims	1.0 page
Background and Significance	2.0 pages
Preliminary Studies (this section is not essential)	2.5 pages (additional results can be placed in an appendix)
Experimental Design & Methods, Expected Results & Interpretation thereof	4.0 pages (detailed for each specific aim)
Implementation Time Table	0.5 pages
Total	10.0 pages

Literature citations are additional to the 10 pages. Full references with titles are required.

registration is not required. It is the student's responsibility to register for classes in a timely manner – all late fees and finance charges will be the responsibility of the student.

B. Thesis Research

Within one month of the completion of rotations, each student must reach a mutual agreement with a faculty sponsor who will serve as their thesis advisor. The choice of thesis advisor must be formally approved by the Graduate Advisory Committee. The student and faculty member together plan a thesis project. Doctoral level work requires a close collaboration with a faculty mentor. It is the responsibility of the student to establish and maintain that relationship. Continuation in the PhD program depends upon the student identifying a mutually agreeable thesis laboratory. The thesis research is the responsibility of each student, who must be able to conceive, carry out and write up (as the thesis) a significant body of work in a logical manner. All faculty are available for discussion and consultation. All students are encouraged to apply for fellowship support from outside agencies, e.g. NIH, NSF, Howard Hughes Medical Institute, March of Dimes, etc.

C. Thesis Committee Meetings

It is recommended that the students meet with their committees every six months. The candidate should provide the program with a 20-30 minute talk should be give as well as a brief written summary of the progress made on the stated aims given to the committee at least one week prior to the meeting. Students are required to meet at least once each year. The following documentation is required and copies must be submitted to the Program Administrator for inclusion into the student's file:

- date of meeting
- student's written report to the thesis committee
- the committee's responses/recommendations
- list of attendees for each meeting
- signatures of student and committee chairman

D . Ph.D. Thesis.

After passing the Comprehensive Examination, the student enters Ph.D. candidacy. During the following years the students perform research towards a thesis defense. Students must give annual reports on the progress of their thesis research to the CSD faculty in the form of 30-minute seminars, and meet at least annually with their Thesis Committee. The Chairman of the Thesis Committee will meet with the GAC to discuss the student's progress and will submit a brief written summary of the outcome of each meeting with the student.

Upon completion of a body of original research that constitutes a significant contribution of new knowledge to the field of cell and developmental biology, students will write a Ph.D. thesis containing this information, and defend this document at an oral examination scheduled by the UCD-AMC Graduate School. Check with the Graduate School for current deadlines, thesis format requirements and required paperwork prior to writing the thesis and scheduling the defense.

1. Guidelines

The rules of the University of Colorado Graduate School concerning a PhD thesis are as follows: "All doctoral students are required to submit a thesis (or dissertation) to the Graduate School as partial fulfillment of the requirements of the degree of Doctor of Philosophy. The form and scope of this thesis is determined by the student, the thesis advisor, the Advisory Committee, and the Program. The thesis should be based upon original investigation and showing mature scholarship and critical judgment as well as familiarity with tools and methods of research. It must be essentially approved by

the examining committee before the final examination can be taken.”

The Graduate Program in Cell Biology, Stem Cells and Development amplifies the definition of the thesis as follows:

*The successful thesis presents a problem-orientated, original and substantive investigation. The methodology and results contained in the thesis must be conclusive and of quality. The standards are to be those maintained by quality, peer-reviewed scientific journals. **It is the expectation of the program that the student have 1 or more first author publications submitted prior to the thesis defense.***

2. Thesis Committee

Once a student is admitted to candidacy, he/she should establish a Thesis Committee with the advice of the thesis advisor and the Director of the Graduate Program. The committee need not be the same as the Comprehensive Exam Committee but should be composed of five Graduate Faculty members; at least one member must be outside the program and the majority from within the program. The thesis advisor is a voting member of this committee. One faculty member of the program should be selected to serve as a chair of the Thesis Committee. This committee can be the same as the Comprehensive Exam Committee.

3. Graduate Advisor

The Chair of the Thesis Committee serves as the advisor to the student and will monitor his/her progress. The Chair must be a member of the Program. It cannot be emphasized enough, however, that each student is responsible for his/her own progress.

4. Guidelines for Supervision of Thesis Work

1. Since all students present their work each year, all Graduate Faculty should follow the progress of all students. When concerns arise they should be discussed immediately with the student, the Thesis Advisor and/or the student's Thesis Committee.

2. Students are encouraged to meet every six months, but must meet at least once a year, with their Thesis Committee. Students must submit a written update on their progress to the Committee at least one week before the Committee meeting. The Chair of the Committee should provide the student and the Program Director with a written summary of the student's progress and recommendations of the thesis Committee. The meetings should be documented (date of meeting, items discussed, committee recommendations, list of attendees, signatures of the student and committee chairman) and a copy provided to the Program Administrator for inclusion into the student's file. The Thesis Committee can recommend more frequent meetings when they feel more careful monitoring is warranted.

3. When the student and his/her thesis advisor agree the work for the thesis has been completed, the student must meet with the Thesis Committee and receive formal approval to begin writing the thesis.

5. Preparation of Thesis and Thesis Defense

1. The Staff Assistant of the Graduate School (currently, Fran Osterberg) holds seminars twice a year on the proper formatting of the thesis.

2. The Thesis Committee must formally approve the written thesis before the final examination can be taken. Written PhD thesis approval from the chair of the Thesis Committee is required prior to

scheduling of the thesis with the Graduate School. The Thesis Approval Form may be obtained from the program administrator. Furthermore, the thesis advisor must find the thesis acceptable prior to submission to the rest of the committee. It is inexcusable for everyone concerned if the student reaches the point of his/her PhD thesis defense and encounters major difficulties with the thesis.

3. Arrangements for the thesis defense must be made in the Graduate School office at least three weeks in advance. The examination must be taken at least three weeks prior to the date on which the degree is to be conferred. Degrees are conferred in May and December. The student must be registered at the time of the thesis defense. In addition, a copy of the thesis must be given to the Thesis Committee **at least two weeks** before the defense.

4. The thesis defense is the final examination of the thesis and related topics. It includes an oral presentation of the salient points of the research, its conclusions and its integration with the rest of the field. The oral presentation will be conducted by the Thesis Committee and only members of the Graduate Faculty may be present. The final decision regarding the result of the thesis defense is made by the Committee.

5. All corrections to the written thesis required by the Thesis Committee must be completed within thirty days from the date of the thesis defense. The signed, written document must be submitted to the Graduate School at that time.

6. The student must receive affirmative votes from the majority of the committee. The examination may be attempted only once. Disqualification of the thesis examination results in dismissal from the Graduate Program without a degree.

7. The student is responsible for providing a bound copy of the thesis to the Thesis Advisor, the members of the Thesis Committee, the Program and the Graduate School.

IV. Graduate School standards

A. Credits. The Graduate School requires at least 30 semester hours in course work (rotations and Research CSBI 7650 count as course hours) and 30 semester hours of thesis research for the PhD (research hours cannot be accumulated until the semester before the Comprehensive Exam is passed). All work undertaken as a graduate student must be in compliance with the academic Code of Honor (see Appendix A of UCD-AMC Graduate Student Handbook).

B. Maintenance of a 3.0 GPA. All students must maintain an average of “B” or better in their course work. Students are expected to earn a “B” or better in all required courses. Only in *exceptional* circumstances may a “B-” in a required course be acceptable, as determined by petition to the GAC. Required courses completed with a grade of below “B-” cannot be counted towards PhD requirements.

C. Preliminary exam. In order to continue in the program, a student must pass Parts I and II of the Preliminary Exam at the end of the first year.

D. Remedial and Disciplinary Actions. Students whose cumulative GPA falls below 3.0 will be placed on Academic Probation by the Graduate School. The student must earn a GPA of 3.0 in each of his/her next two semesters in order to be removed from Academic Probation. The Graduate School requires that after a student is put on academic probation, he/she must maintain a 3.0 in all subsequent

semesters. Failing to meet either condition will lead to immediate dismissal from the Graduate School. A “B-” or below in any required course is considered unsatisfactory academic progress and more than one “B-“ or below is grounds for immediate dismissal from the Program.

A graduate student who receives an unsatisfactory grade in a course (a B- or below) may repeat that course once or successfully complete an alternative assignment, upon written recommendation from the GAC and approval by the Graduate School Dean (provided the course has not been previously applied toward a degree). The two grades received will be averaged in calculating the grade point average, and all grades received will appear on the student’s transcript. The course may be counted only once toward satisfying the unit requirement for the degree.

After two semesters, a GAC meeting will be held to determine the student’s progress. If the student’s cumulative GPA is 3.0 or above, the student will be removed from probation. If the student’s cumulative GPA is below 3.0, the chair of the Thesis Committee, the thesis advisor and the student will meet with the CSD Steering Committee. The Steering Committee will make one of the following determinations:

1. The student is not in good academic standing and will be placed on probation again for not more than 30 days.
2. The student is not in good academic standing and will be released from the program.

All meetings will be thoroughly documented and given to the Program Administrator for placement into the student’s file.

B. If the Preliminary exam is failed, the student’s record will be reviewed by the GAC. At this point the student may be asked to retake part of the exam, the entire exam, or leave the PhD training program.

E. Change in Thesis Lab. If a student leaves a thesis lab for any reason, (but is still considered by the CSD GAC to be in good academic standing) the student has 1 current semester (but no more than 90 days) to relocate to another thesis lab and determine a new thesis advisor if necessary. It is the student’s responsibility to locate another thesis lab and/or advisor. Within those 90 days, the student must rotate for a minimum of 6 weeks in a potential new advisor’s lab, so that the final decision to join the new lab can be made within the 1 semester/90 day window.

F. Time Limit of PhD Studies. Students have six years from the time they enter Graduate School to complete all requirements for the degree. Continuation after six years requires the approval of the student’s Thesis Committee and the CSD Steering Committee. It will also be necessary to pass a second comprehensive examination, similar in content to the first, before a thesis defense can be scheduled.

G. Leave of absence. It is the policy of the CSD program to grant leave of absences only under extreme circumstances. A formal letter must be submitted to the GAC and program director explaining the reasons a leave of absence is necessary. Before the leave is taken it must be approved by the GAC and the Graduate School. After a student joins a thesis lab, the PI must also approve the leave of absence. As per the rules of the Graduate School, only 15 days of paid leave is guaranteed, after that time period it is under the discretion of the program and the PI.

V. Obligations and Record Keeping

A. Attendance. All graduate students are **required** to attend the weekly Cells, Development and Cancer (CDC) seminars (usually, but not always, held on Wednesdays at noon) and specialized research forums. These seminars are a mixture of talks by invited speakers and research reports from the faculty, students and postdoctoral fellows in laboratories of the Cell Biology, Stem Cells and Development Program faculty.

The students also organize a bi-monthly journal club, and all CSD students are **required** to participate.

All graduate students are **required** to attend post-rotational seminars, comprehensive examinations, student update presentations, and Thesis Defense Seminars given by CSD program students.

All notebooks, original data and reagents from rotational and thesis work are the property of the advisor and must be left with the advisor at the completion of the work.

It is the student's responsibility to register for courses in a timely manner – all late fees and finance charges will be the responsibility of the student.

B. Colorado Residency. First-year students who are US citizens must obtain a Colorado Driver's License at the time of arrival on the UCD-AMC to begin the process of establishing Colorado residency. If residency has not been established by the beginning of the second year, the student is responsible for the non-resident portion of tuition that exceeds the resident assessment. The paper work for establishing Colorado Residency must be filed with the Registrar prior to second year registration.

C. Student's Files. A file for each student will be kept by the Program Administrator. All relevant records should be given to the Program Administrator for the files, including published abstracts and papers, notifications of awards and honors, and copies of forms filed with the Graduate School. These files should reflect the total record of the student during his/her entire graduate career. Upon written request, the records may be examined by the student.

VI. Other CSD Program events

A. Annual Student Research Retreat. Each fall, the students host an out-of-town retreat for the students and faculty in the Graduate Program in Cell Biology, Stem Cells and Development. The purpose of the retreat is twofold: 1) to provide everyone with the opportunity to get together and interact on a scientific/intellectual level so as to cultivate new interactions and strengthen existing ones; and 2) to provide an opportunity for incoming first year CSD and Biomedical Sciences Program (BSP) graduate students, and 1st and 2nd year MSTP students to become familiar with the research activities and faculty within the CSD Program. The retreat is usually held in September. Current senior students are expected to present their work either via a poster or a talk.

B. Participation in Recruitment Functions. During February/March each year, prospective student applicants visit our program for interviews. It is in the Program's best interest to attract and retain the best of these prospective students. To do this we need the help of current students and CSD faculty who can convince these individuals that our Program is the place to be! When asked, please be willing

to spend some time with prospective students during dinners or other functions. Our CSD Program can and has flourished with your irreplaceable help.

C. Description of committees. Each committee within the program has a student representative. Below is a description of the duties for each position:

Recruitment: This committee reviews submitted applications to the graduate program, selects candidates to interview in person or by telephone, organizes recruitment weekend, and ultimately selects who will be admitted to the program. The student members participate fully in the entire process, and in particular are in charge of enlisting and organizing the student body to help with both academic and social recruitment efforts.

Advising: The Graduate Advisory Committee helps students maintain progress toward their Ph.D. degree. As a member of this committee, the student member helps discuss student progress and may be recruited to and/or advise the committee to tutor first year students in need. This committee requires that the student member be a doctoral candidate, i.e., has passed the Comprehensive Exam. In addition, the student member of the advising committee also serves on the Steering Committee of the graduate program.

Curriculum: This committee discusses the current curriculum and suggests and implements changes in the best interest of the program and students, including but not limited to selection of Advanced Topics courses to be offered each academic year based on faculty availability and student interests.

Membership: This committee is responsible for faculty membership within the program. The student member participates in the establishment of guidelines for faculty membership, reviews current faculty participation, and makes recommendations concerning new faculty applicants.

Retreat: Every fall, the program has a retreat (typically overnight) in a mountain location. It is the role of the students (three) on the Retreat Committee to organize the retreat with the oversight of a CSD graduate program faculty representative. With a pre-determined budget in mind, the students have a role in selecting the location as well as an invited speaker.

Steering Committee: This committee consists of the chairs of each of the 6 graduate program committees plus additional members as deemed appropriate by the director of the program.

Committee of Students: Consists of the student members of the 5 Graduate Program Committees (Advising, Recruitment, Curriculum, Membership and Retreat) and is chaired by the student member of the Advising Committee. The goal of this committee is to organize student activities and provide a mechanism to discuss student issues that can be directed to the Steering Committee and/or program director.

UCD-AMC
Graduate Program in Cell Biology, Stem Cells and Development

I. Advanced Topics and Electives in Cell and Developmental Biology

Students must take at least four Advanced Topics (CSDV 7670) or elective courses, generally beginning in year two. Each topic is 1-2 credits and comprises 15-30 hrs of meeting time within a semester. In general, one topic will be offered per semester. Students are encouraged to submit ideas for Advanced Topics Courses of special interest to them to the Curriculum Committee. Students who are in the program for longer than five years are required to take one additional Advanced Topic per year until graduation. This requirement has been in effect since the 1991-92 academic year.

A. Electives

Students may select from the following list or, in special cases, from the course offerings of the other campuses of the University of Colorado. Electives are selected based on the student's interests and upon consultation with his/her first-year or thesis advisor (current as of 7/07; additional courses may be added).

BIOI 7711	Bioinformatics	L.Hunter
BMST 7350	Protein Chemistry I	R. Hodges
BMST 7450	Protein Chemistry II	R. Hodges
CSDV 7605	Stem Cells and Development	D. Clouthier
IDPT 7300-7301	Technology Transfer and Biotechnology	K. Newell
IMMU 7662	The Immune Response	P. Marrack
IMMU 7663	Advanced Immunology	D. Riches
MICB 7621	Molecular Mechanisms of Bacterial Disease	R. Gill
MICB 7622	Contemp. Topics in Molecular Bacteriology	R. Gill
MICB 7627	Molecular Virology and Pathogenesis	J. Schaack
MOLB 7800	Advanced Topics in Molecular Biology	J.Tyler
NRSC 7614	Molecular Basics of Neuropsychiatric Disorders	?? Leonard
NRSC 7615	Developmental Neurobiology	A. Ribera

PATH 7600	Mechanisms and Models of Disease	S. Nordeen
PHCL 7606	Receptors and Cell Signalling	T. Langan
PHCL 7620	Graduate Pharmacology	D. Jones & N. Zahniser
PHSC 7530	Cancer: Experimental and Medical Aspects	A. Malkinson
RPSC 7801	Introduction to Reproductive Endocrinology	P. Neville

B. Independent Studies in Cell and Developmental Biology (CSDV 7850)

Independent Study is to accommodate students who wish to (1) take a Professional School Course for credit and (2) gain a defined expertise with a faculty mentor other than their thesis advisor. Consent of the faculty member offering the Independent Study and the Program Director are required.

**Cell Biology, Stem Cells and Development Graduate Program
Current students as of September 2008**

STUDENT	START YEAR	THESIS ADVISOR	PRELIMS	COMPS	THESIS COMMITTEE CHAIR
Danielle Harlow	2002	Barlow	6/04	11/04	Artinger
Irene Choi	2003	Roop	6/04	11/05	Schedin
Glenn Simon	2003	Prekeris	6/04	12/05	Banfield
Elizabeth Tarbutton	2003	Schedin	6/04	11/06	Reyland
Roslyn Bauer	2003	Hutton	6/03	8/05	Barlow
Jian Jing	2004	Prekeris	6/05	9/06	
Letitia Kwok	2004	Artinger	6/05	3/07	Clouthier
David McKean	2004	Niswander	6/06	6/07	Artinger
Brittany Allen	2005	Reyland	6/06	9/07	Schedin
Tariq Adwan	2005	Reyland	6/06	10/07	Hooper
Jo-Anne Goh	2005	Sorkin	6/06	10/07	
Ha Nguyen	2005	Barlow	6/06	11/07	
Summer Lennox	2006	Reyland	6/07		
Francie Hyndman	2006	Clouthier	6/07		
Ying Zhang	2006	Niswander	6/07		
Aaron Huebner	2006 (BSP)	Roop	6/07		
Hau-Chern Jan	2007	Niswander			
John Schiel	2007	Jones	6/08		
Chris Washenberger	2007 (BSP)	Niswander	6/08		

**UCD-AMC
Graduate Program in Cell Biology, Stem Cells and Development
Program Faculty**

Graduate Faculty

Primary Appointment

Artinger, Kristin	Craniofacial Biology
Barlow, Linda	Cell & Developmental Biology (CSD)
Bendiak, Brad	CSD
Britt, Steven	CSD
Caldwell, John	CSD
Clouthier, David	Craniofacial Biology
Crapo, James	National Jewish Hospital
Davie, Neil	Pediatrics
Doctor, Brian	Gastroenterology
Evans, Thomas	CSD
Finger, Thomas	CSD
Frerman, Frank	Pediatrics
Garcea, Robert	Pediatrics
Goodman, Stephen	Pediatrics
Hooper, Joan	CSD
Howell, Kathryn	CSD
Hutton, John	Barbara Davis Center for Diabetes
Koch, Peter	Dermatology
Koster, Maranke	Dermatology
Kraus, Jan	Pediatrics
McManaman, Jim	OB/Physiology
Neville, Margaret	Physiology
Niswander, Lee	Pediatrics
Pfenninger, Karl	Pediatrics
Prekeris, Rytis	CSD
Restrepo, Diego	CSD
Reusch, Jane	Medicine
Reyland, Mary	Craniofacial Biology
Roop, Dennis	Dermatology
Schedin, Pepper	Oncology
Selitrennikoff, Claude	CSD
Sorkin, Alexander	Pharmacology
Williams, Trevor	Craniofacial Biology
Virginia Winn	OB

**UCD-AMC
Graduate Program in Cell Biology, Stem Cells and Development
2007-2008 Committee membership roster**

Linda Barlow, Director

Recruitment Committee

Pepper Schedin, chair

Joan Hooper

Glenn Simon and Letitia Kwok, student representatives

Graduate Advisory Committee

Kristin Artinger, chair

Tom Evans, member

Steve Britt, member

Brittany Allen, student representative

Curriculum Committee

Rytis Prekeris, Chair

Lee Niswander, member

Tom Finger, member

Francie Hyndman, student representative

Membership Committee

Mary Reyland, chair

Joan Hooper, member

Jim McManaman

Irene Choi, student representative

CSD Retreat Committee

David Clouthier

Brittany Allen

Francie Hyndman

Jian Jing

STEERING COMMITTEE

Linda Barlow

Kristin Artinger

Rytis Prekeris

Joan Hooper

Pepper Schedin

Mary Reyland

Dennis Roop

Andy Bradford

CDC Seminar Series Reps

Trevor Williams

Lee Niswander

Joan Hooper

UCD-AMC
Graduate Program in Cell Biology, Stem Cells and Development
 Degrees conferred as of September 2007

Student	Date of thesis defense	Thesis Advisor	Current position
Allison Vigers (PhD)	2/5/92	Selitrennikoff	Senior Researcher CU Boulder Dept of Molecular, Cellular and Developmental Biology
Brent Wright (MD, PhD)	5/12/92	Scholey	Resident, UCD-AMC
Corinna Burger (PhD)	8/25/94	Ribera	Assistant Professor University of Florida, Dept of Neurology
Kathryn Lohse (PhD)	8/2/94	Pfenninger	
Jeff Crosby (PhD)	10/21/94	Howell	Director of Inflammation Research, ISIS Pharmaceuticals, San Diego
Hilary Srere (PhD)	1/17/95	Martin	Marketing Manager, Bio-Rad Laboratories
Paul Awald (PhD)	5/19/95	Selitrennikoff	Postdoc, MIT
Colin Monks (PhD)	6/19/95	Kupfer	President Intelligent Imaging Innovations Denver, CO
Kurt Griffin (MD, PhD)	3/96	Frerman	Intramural Researcher NIH/NICHD Section on Endocrinology & Genetics
Barbara Biery (PhD)	3/19/96	Goodman	Technical writer, Life Technologies
Leslie Stone-Roy (PhD)	1/24/96	Finger	Senior Researcher Colorado State University Dept. of Biomedical Sciences
Steven Jones (PhD)	5/27/97	Howell	Associate Director of Discovery & Animal Biology Elusys Therapeutics Inc., New Jersey

Tonia Von Ohlen (PhD)	10/8/97	Hooper	Assistant Professor Kansas State University, Division of Biology
Nichole D. Schueck (MS)	11/14/97	Koeller	?
Maria (Johnson) Curtis (PhD)	4/9/98	Granholm	?
Denise Salazar-Rogers (PhD)	4/29/98	Frerman	Assoc Scientific Director, Quest Diagnostics
Mark Nordeen (PhD)	10/19/99	Caldwell	Associate Dean for Arts & Sciences Central Wyoming College, Riverton, Wyoming
Hilary Chouinard (MS)	12/98	Ribera	Planned Parenthood, Denver
Kenneth Kosten (MS)	12/98	Garcea	?
Randy Taylor (MD, PhD)	7/12/99	Howell	ENT Physician in Private Practice
Eric Bush (PhD)	11/03/99	Perryman	?
Christine Wu (PhD)	3/12/01	Howell/Neville	Assistant Professor UCD-AMC Dept of Pharmacology
Mizuno Sugawara (MS)	3/19/01	Sussel	Homemaker, Japan
Fangtian Huang (MS)	6/1/01	Sorkin	?
Russ Bowler (MD, PhD)	6/21/01	Crapo	Associate Professor, University of Colorado Health Sciences Center, Dept of Medicine
Keith Mikule (PhD)	5/17/01	Pfenninger	ArQule Biomedical Institute, Inc., Norwood, Massachusetts
Josh Hall (MD, PhD)	7/27/01	Finger	Resident Univ of California, San Diego Dept of Psychiatry
Luis Miranda (PhD)	5/2/02	Franzusoff	?
James Witowsky (PhD)	11/19/02	Johnson	Research Institute of Molecular Pathology Vienna, Austria
Cindy Yee (PhD)	4/23/03	Finger	Research Scientist, Genentech San Francisco, CA

Scott Barbee (PhD)	5/5/04	Evans	Postdoctoral Research Associate University of Arizona, Dept of Molecular and Cellular Biology
Jennifer Gillette (PhD)	5/15/04	Nielsen-Preiss	Postdoctoral fellow NIH/NICHD Section on Organelle Biology
Alex Lublin (PhD)	11/18/04	Evans	Post-doc, Mt. Sinai Hospital
Jay Gatlin (PhD)	12/15/04	Pfenninger	Postdoctoral researcher Univ. of North Carolina, Chapel Hill Dept. of Biology
David Kent (PhD)	7/19/04	Hooper	Post-doc, Univ Utah
Denise Birkholz (PhD)	7/15/05	Britt	Postdoctoral fellow UCD-AMC Dept. of Craniofacial Biology
Mike Humphries (PhD)	9/21/05	Reyland	Post-doctoral researcher, Array BioPharma, Boulder
Christina Chao (PhD; MSTP)	3/6/06	Sussel	Univ of Colorado School of Medicine
James Earl (Ph.D; MSTP)	1/13/06	Britt	Univ of Colorado School of Medicine
Nickos Sophos (MS)	7/06	Reyland	
Malinda O'Donnell (MS)	07	Garcea	
Agne T (Ph.D; MSTP)	2008	P. Jones	Univ. of Colorado School of Medicine