September 20, 2017

GUIDELINES FOR THE GRADUATE PROGRAM IN CELL and DEVELOPMENTAL BIOLOGY

Program Overview:

The major focus of the program in Cell and Developmental Biology is graduate education at the doctoral level. The various requirements are intended to prepare each student to be both scientist and teacher and to give the training necessary to begin a research career. The curriculum provides a broad background in basic biomedical sciences in the first year, followed by more specialized coursework in the second year depending on the student's interests and needs. Research is begun in the first year of the program, and career skills such as grant and manuscript writing, teaching, and oral presentations of scientific data are emphasized. For the first year of research, students work in several different laboratories during research rotations, and often participate in research training programs offered at other institutions (e.g. Cold Spring Harbor Laboratory; Marine Biological Laboratory (MBL), Woods Hole; Mount Desert Island Biological Laboratory). "Technique courses" to gain different points of view or ancillary techniques that broaden the student's research training are also encouraged.

Course Requirements:

A total of 30 didactic credit hours are required for the PhD. Along with all graduate students at SUNY Upstate Medical University. All first year students in the Department of Cell and Developmental Biology are required to participate in the graduate core curriculum, which provides a basic foundation in biochemistry and cell biology. In addition to the core curriculum, students electing to complete a PhD in the Department of Cell and Developmental Biology are required to take Designing a Research Proposal (630GS, 3 credits) and additional courses as necessary to complete 30 credit hours. These may include departmental courses such as Gross Anatomy (550A, 9 credits, summer or fall), Microscopic Anatomy (511A, 7 credits), or Systems Neuroscience with Neuroanatomy Lab (691N, 5 credits). In addition to the courses outlined above, students may fulfill credit requirements by completing non-Departmental advanced coursework as recommended by the student's sponsor and the Graduate Student Advisory and Training Committee. Some of the advanced courses available include: Special Topics in Cell and Molecular Biology, Biochemistry and Molecular Biology Principles, Ion Channels, Molecular Pharmacology: Receptors and Signal Transduction, Topics in Developmental Neurobiology, Physiology and Pharmacology of the Heart, Protein Sorting and Vesicular Trafficking, and Spreadsheet Analysis of Biological Data.

Research Rotations:

Students performing laboratory rotations in the Department of Cell and Developmental Biology will receive credit under Methods in Cell and Developmental Biology, 616A. Credit hours are variable at the discretion of the research mentor in consultation with the Graduate School Advisory Committee.

Graduate Student Presentations:

Students electing to complete a PhD in the Department of Cell and Developmental Biology will present a seminar on their research to the department within 6 months of successful completion of their qualifying exam. Students are also encouraged to present their research at local, national and international scientific meetings and in-house symposia.

Departmental Seminars:

Students are required to attend all Departmental seminars during their graduate career.

Teaching Opportunities:

No requirement for teaching exists in the Department of Cell and Developmental Biology. However, as an opportunity to gain teaching experience, students working toward a PhD in the Department who have satisfactorily completed Gross Anatomy, Microscopic Anatomy, or Neuroscience may elect to serve as a teaching assistant for that course at the discretion of the student, mentors, and course director. Graduate credit for teaching is given through Special Topics in Anatomical Science (615A) "Teaching in ..." (Gross Anatomy = 4 credits; Microscopic Anatomy = 3 credits; Neuroanatomy Lab = 3 credits). Letter grades for teaching are assigned by the course coordinator, following consultation with the appropriate faculty members.

Maintaining Good Academic Standing:

Continuation in the program and permission to take the College of Graduate Studies qualifying examination are contingent upon satisfactory performance in didactic course work and development of research potential through laboratory rotations. In accordance with the guidelines of the College of Graduate Studies, all graduate students are required to maintain a GPA of 3.0 or better to be considered in good academic standing. Students in the Department of Cell and Developmental Biology are required to maintain a GPA of 3.0 or better in classroom based didactic coursework (excludes research based coursework 616A, but includes teaching 615A1,2,3). They are also required to maintain a GPA of 3.0 or better in research based didactic coursework (616A). If a student does not meet these minimum performance standards, the student's overall performance will be reviewed by the faculty, and the student may be placed on academic probation. Failure to improve a poor academic performance usually results in dismissal from the Department's Graduate Program.

Qualifying Examination for the Ph.D. Degree:

The qualifying examination to continue for the Ph.D. degree will be administered in accordance with the Guidelines of the College of Graduate Studies. Thus, the exam should be completed by the end of the summer of the second year (or soon thereafter); exceptions require approval from the Dean. This examination is intended to determine whether the student has the creative and critical intellectual skills and a sufficient information base to create new scientific knowledge. The Qualifying Examination Committee consists of six persons appointed by the Dean of the College of Graduate Studies, on recommendation by the student's thesis advisor. Faculty from three or more

departments of this or other qualified institutions are represented on the committee, and not more than half of the committee may have a primary appointment in the same department. The chair of the Qualifying Examination Committee cannot be a member of the Department of Cell and Developmental Biology, but must be a member of the Graduate Faculty Organization.

Examination Format

The examination format will consist of both a written and an oral component. The student will write a research proposal detailing his/her intended thesis project, using the format of the current NIH RO1 application. The application should be no longer than 13 pages, excluding the Abstract and Bibliography. The proposal must include at least one Specific Aim and associated Significance/Experimental Plan as needed that incorporates either an alternative model system or experimental strategy, that is not directly related to the student's main thesis focus and is beyond the product of any previous formal grant writing course. The advisor can approve the general concept of this additional Aim but **must not** provide either intellectual or editorial input. Students can however, receive feedback from their peers or guidance from other Faculty with expertise in the proposed area of investigation.

Following the submission of the written proposal, the student's committee will conduct an oral examination that will cover the research proposal and any additional material the committee feels is appropriate. If either the written or oral examination is judged to be inadequate, the committee may delay final action for further examination or in order to take other action deemed appropriate by the examining committee. If a student fails the qualifying examination, the student may be reexamined by a new committee after a minimum of 30 days but no more than 90 days. Failure on two qualifying examinations results in automatic dismissal from the doctoral program at the end of the current semester.

Graduate Student Advisors:

In the first year of the PhD program, all students will be under the guidance of the Graduate School Advisory Committee. Once a doctoral laboratory has been selected, students will be under the guidance of the mentor and the Department of Cell and Developmental Biology Graduate Student Advisory and Training Committee until the student completes the qualifying exam. Commencing with identification of a doctoral laboratory and continuing until the completion of the qualifying exam, the mentor shall provide a written evaluation of the student to the Departmental Graduate Student Advising and Training Committee. The committee will forward evaluations to the student and the Department Chair along with recommendations for corrective actions. Copies of the evaluation will be signed by the student, the mentor, and the Chair and returned to the committee.

Following completion of the qualifying examination, the student and thesis advisor will choose a Thesis Advisory Committee consisting of at least three faculty members, including the thesis advisor. Typically, this committee will consist of faculty who served on the student's Qualifying Examination Committee, since these faculty members will already be familiar with the student's proposed thesis research. This committee will meet with the student twice a year to monitor the student's progress in his/her thesis research. After

each meeting, a written evaluation of the student's progress will be submitted by the committee to the Department Chair, the Dean of Graduate Studies, and to the student. In addition, the Graduate Student Advisory and Training Committee will continue to monitor the progress of students throughout the program to ensure that all requirements are met.

Doctoral Dissertation:

The Ph.D. dissertation will represent the culmination of an extensive and scholarly original research project(s), which furthers knowledge in the field. The format will include an introduction, chapters (usually in the form of completed manuscripts published or ready for publication) and a summary section. For the thesis defense, the student is required to present his/her research at a Departmental seminar, which will be open to the public. The examination by the formal Thesis Committee will immediately follow this seminar.

Masters Degree Requirements:

A Master's degree is offered to students by the Department of Cell and Developmental Biology. Students will be required to complete 20 didactic credits and 10 research credits. Didactic credit will consist of at least two of the following core courses: Biochemistry, Cell & Molecular Biology (part 1, 820 GS), Biochemistry, Cell & Molecular Biology (part 2, 820 GS), Cell Physiology & Neurobiology (880PAPH), and Microbiology & Immunology (840M). A written thesis will be prepared by the student based upon data derived from experimentation originating with the student in conjunction with his/her mentor. In addition, at the completion of the Masters thesis, the student will present his/her research at a Departmental seminar, which will be open to the public. This presentation will be followed by an oral examination by the Thesis Committee.