

THE UNIVERSITY OF CHICAGO

**COMMITTEE ON DEVELOPMENT, REGENERATION, AND
STEM CELL BIOLOGY**

2016-2017

GRADUATE PROGRAM HANDBOOK

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PROGRAM OF STUDY (IN BRIEF)

Quantitative Approaches Bootcamp

Incoming students from all programs in the Biological Sciences Division are strongly encouraged to attend the week-long Quantitative Approaches Bootcamp, held at the Marine Biological Laboratory in Woods Hole, Massachusetts, in September each year. DRSB students are expected to attend.

Founded in Woods Hole, Massachusetts, in 1888, the MBL is a private, nonprofit institution and an affiliate of the University of Chicago. The MBL is dedicated to scientific discovery and improving the human condition through research and education in biology, biomedicine, and environmental science.

The Bootcamp will include workshops, tutorials, seminars, and social activities designed to develop students' computational, statistical, and professional skills, familiarize them with the MBL, and help them get to know their fellow first-year students in the BSD.

First Year. The first year of graduate study is spent in coursework, independent reading, and exploratory research. Students are required to undertake short research projects in at least three different laboratories before beginning their dissertation research. These rotations are performed during the first academic year – one each quarter. Additional rotations and/or later rotations require approval from the Curriculum Committee. A written report or oral presentation is required for each rotation; all rotations are graded, and two count towards the course requirement for the degree.

A seminar course, *Introduction to Research*, has been organized particularly for first year students. This course consists of a series of presentations by faculty to introduce their research programs.

There are multiple seminar series within the Biological Sciences Division, including a monthly seminar offered by the Committee. Students are required to attend the DRSB seminars and are encouraged to attend other seminars of interest.

At the end of June, students take the Preliminary Examination as a first step towards candidacy for the Ph.D. The exam consists of the preparation of a written research proposal in the field of developmental biology and an oral defense of that proposal.

Second year. Coursework will continue during the second year as needed to fulfill the requirements. Students choose research advisors by July 1 of the Summer Quarter after the first year, and begin developing a research project. By early Fall Quarter, each student assembles a thesis committee: it is composed of the student's advisor and three other faculty members. Its members are proposed by the student and the student's advisor, and must then be approved by the Curriculum Committee. The student then prepares a written proposal for dissertation research and defends this proposal before the thesis committee (the Qualifying Examination) by the end of Fall Quarter. Passing the Qualifying Exam permits the student to enter into candidacy for the Ph.D. Students must have a subsequent meeting with their thesis committee before the start of the Fall quarter of their third year.

Advanced Years. After the Qualifying Exam, the student generally spends full time on thesis research, although some students may elect to take one or more additional advanced classes. Students are encouraged to take advantage of the many seminars, Journal Clubs and Research in Progress series that are offered within the division. Regular participation in the DRSB Journal Club is expected.

Students are strongly recommended to attend and present their work at least once at a national/international research conference before graduating, and ideally once a year in their 3rd, 4th and 5th years of study (smaller regional conferences can often provide great opportunities to give talks rather

than posters). Finally, each graduating student writes a dissertation describing his or her research, presents the work in a public seminar, and defends it before a faculty examining committee. As described further below, DRSB students are required to publish a minimum of one first author peer-reviewed paper in order to graduate.

Evaluation. Throughout their term as graduate students, students are expected to have frequent informal conversations with professors in their courses, their research advisor, and members of their doctoral committees. In this way, students can obtain frequent appraisals of their progress and constructive advice.

Formal evaluation of each student's progress continues every academic year. In the first year and a half, the evaluation is based on the student's performance in courses, laboratory rotations, the Preliminary Examination, and the Qualifying Examination. In later years, the research advisor and doctoral committee oversee the student's dissertation research progress; a report is submitted after each meeting that becomes part of the student's permanent file and is reviewed by the Curriculum Committee. If the Committee is apprised of any deficiencies in performance, the student will receive a letter describing those deficiencies and making suggestions about how they might be remedied. Students in their fifth and later years must meet with their doctoral committee every six months.

REQUIREMENTS FOR THE MASTER OF SCIENCE DEGREE

Students in the Committee are admitted directly for study towards the Ph.D. degree. In exceptional cases, when students leave the program they may receive a M.S. degree. This requires completing six (6) courses, including the core courses; students must receive a grade of B or better in two of the three distributional courses and two of the three developmental biology courses, and maintain a B average overall in coursework. The Curriculum Committee must approve the awarding of the M.S. degree in each case. Students may, of course, elect at any time to leave the program without completing the required courses or receiving the M.S. degree.

REQUIREMENTS FOR THE PH.D. DEGREE

A Ph.D. candidate must fulfill certain formal coursework requirements, pass the candidacy examinations, and present a satisfactory dissertation describing the results of original research.

The Committee expects a knowledge of and proficiency in contemporary developmental biology as well as in the related fields of molecular and cell biology and genetics. This requirement will normally be met by fulfilling the formal coursework listed below, but detailed degree programs are flexible. Courses taken at other institutions, in other departments, or as part of the Medical School curriculum may substitute for required Committee courses with the approval of the Curriculum Committee.

Formal Coursework

To obtain a Ph.D. in the Division of Biological Sciences, nine graded courses are required. The DRSB graduate program requires a "quality" letter grade; a grade of "Pass" (or "P") will not fulfill the requirement, unless a course only provides pass/fail grading. Of the nine courses, the Committee requires three in developmental biology, and a distributional requirement of one course in each of three disciplines:

- molecular biology
- cell biology
- genetics

Students are required to take a minimum of three courses each quarter; to meet this requirement, students may take two courses and a rotation. First year students are required to take the seminar course, "Introduction to Research"; however, it is graded Pass/Fail and will not satisfy the requirement.

To take fewer than two courses and a rotation in a quarter, a student must obtain the approval of his/her academic advisor and the Curriculum Committee. A student may not drop a course without the approval of his/her academic advisor and the Curriculum Committee.

One of the courses the student takes may be a reading course. **Reading courses taken for a grade must be approved by the Curriculum Committee prior to registration.** Students must petition the Committee for approval in writing, and include with the petition a copy of the course syllabus. When approval has been given, the student must register for the reading course during the regular quarterly registration session. Every reading course must conform to the following requirements: 1) it must meet weekly, 2) the instructor must provide a syllabus for the course and an evaluation of the student's performance, both of which will become part of the student's file, and 3) the student must submit a written paper.

Training Grant Requirements

Students should be aware that, in addition to the divisional and committee course requirements, training grants may also have course requirements that funded students must fulfill. The Molecular and Cellular Biology training grant requires students to take one course each in molecular biology, cell biology, and proteins. The Genetics and Regulation training grant requires students to take one course each in transmission genetics, molecular biology, and population or evolutionary genetics. The Developmental Biology training grant requires students to take at least two courses from among those acceptable for the developmental biology requirement (see below). If you have questions about training grant course requirements, you should consult the Training Grant Administrator.

Courses acceptable for requirement in developmental biology

DVBI 32000. Quantitative Analysis of Cellular Dynamics

The basic focus of the course will be quantitative approaches to understanding organization and dynamics at the molecular, subcellular and cellular levels, and will rest on three pillars - modern imaging and image analysis, quantitative analysis and presentation of data, mathematical modeling and computer simulations. Spring Qtr.

DVBI 32500. Evolutionary Aspects of Gene Regulation

This advanced level course focuses on reading and participation. Each meeting period is dedicated to a new Topic, several of which make up a Module. Typical modules are: Transcription factors and cis-regulatory elements, Functional consequences of regulatory changes and microRNAs as a mechanism of gene regulation. Students present and discuss several papers from the primary literature during this course. Autumn Qtr.

DVBI 33850. Evolution and Development

The course examines the evolution of animal development. Special attention is given to the development of invertebrate phyla from sponges to lower chordates. References to vertebrate body plans are included. Original research papers will be assigned to introduce current debates. Students will be asked to contribute an oral presentation on a selected research topic that fits the broader goal of the course. Autumn Qtr.

DVBI 36200. Stem Cells and Regeneration

The course will focus on the basic biology of stem cells and regeneration, highlighting biomedically relevant findings that have the potential to translate to the clinic. We will cover embryonic and induced

pluripotent stem cells, as well as adult stem cells from a variety of systems, both invertebrate and vertebrates. Autumn Qtr.

DVBI 36400. Developmental Mechanisms

This course provides an overview of the fundamental questions of developmental biology, with particular emphasis on the genetic, molecular and cell biological experiments that have been employed to reach mechanistic answers to these questions. Topics covered will include formation of the primary body axes, the role of local signaling interactions in regulating cell fate and proliferation, the cellular basis of morphogenesis, and stem cells. Winter Qtr.

DVBI 35600. Vertebrate Development

This advanced-level course combines lectures, student presentations, and discussion sections. It covers major topics in the developmental biology of vertebrate embryos (e.g., gastrulation, segmentation, nervous system development, limb patterning, organogenesis). The course makes extensive use of the current primary literature and emphasizes experimental approaches including embryology, genetics, and molecular genetics. Spring Qtr.

DVBI 36100. Plant Development and Molecular Genetics

Genetic approaches to central problems in plant development will be discussed. Emphasis will be placed on embryonic pattern formation, meristem structure and function, reproduction, and the role of hormones and environmental signals in development. Lectures will be drawn from the current literature; experimental approaches (genetic, cell biological, biochemical) used to discern developmental mechanisms will be emphasized. Graduate students will present a research proposal in oral and written form; undergraduate students will present and analyze data from the primary literature, and will be responsible for a final paper. Spring Qtr.

DVBI 39800/39900. Reading course in an area of developmental biology of special interest to the student. Must be prearranged with a faculty member and preapproved by the Curriculum Committee.

Courses acceptable for distribution requirements

Molecular Biology

MGCB 31200. Molecular Biology I

Nucleic acid structure and DNA topology; methodology; nucleic-acid protein interactions; mechanisms and regulation of transcription in eubacteria, and of replication in eubacteria and eukaryotes; mechanisms of genome and plasmid segregation in eubacteria. Winter Qtr.

MGCB 31300. Molecular Biology II

The content of this course will cover the mechanisms and regulation of eukaryotic gene expression at the transcriptional and post-transcriptional levels. Our goal is to explore research frontiers and evolving methodologies. Rather than focusing on the elemental aspects of a topic, the lectures and discussions highlight the most significant recent developments, their implications and future directions. Spring Qtr.

Genetics

MGCB 31400. Genetic Analysis of Model Organisms

Fundamental principles of genetics discussed in the context of current approaches to mapping and functional characterization of genes. The relative strengths and weaknesses of leading model organisms are emphasized via problem-solving and critical reading of original literature. Autumn Qtr.

Cell Biology

MGCB 31600. Cell Biology I

Eukaryotic protein traffic and related topics, including molecular motors and cytoskeletal dynamics, organelle architecture and biogenesis, protein translocation and sorting, compartmentalization in the secretory pathway, endocytosis and exocytosis, and mechanisms and regulation of membrane fusion. Autumn Qtr.

MGCB 31700. Cell Biology II

This course covers the mechanisms with which cells execute fundamental behaviors. Topics include signal transduction, cell cycle progression, cell growth, cell death, cancer biology, cytoskeletal polymers and motors, cell motility, cytoskeletal diseases, and cell polarity. Each lecture will conclude with a dissection of primary literature with input from the students. Students will write and present a short research proposal, providing excellent preparation for preliminary exams. Cell Bio I 31600 is not a prerequisite. Winter Qtr.

Students entering the Committee with advanced coursework at graduate level should inquire whether this coursework can substitute for required electives.

Students must maintain a grade average of “B” or better in their coursework, and cannot have more than one “C” in their three developmental biology courses or one “C” in their distributional courses. The Curriculum Committee will advise students who are not in good standing at the beginning of the Spring Quarter in their first year.

RESEARCH INTERESTS OF COMMITTEE FACULTY

Cunningham: hematopoietic stem cells; transcriptional control of early development.

Dawson: biochemical mechanisms of neuronal cell injury.

De Jong: hematopoietic stem cell transplant, cancer and blood diseases.

Du: retinoblastoma protein function and regulation; cell cycle control.

Fehon: molecular genetic analysis of specialized membrane domains.

Ferguson: cell fate specification and stem cell biology in *Drosophila*.

Gilad: genetic and regulatory differences between humans and other primates.

Glotzer: molecular mechanisms of cytokinesis in animal cells.

Green: neurotransmitter receptor assembly and expression.

Grove: cell-lineage relationships in the cerebral cortex.

Haselkorn: *Anabaena* heterocyst formation.

Heckscher: development and function of sensorimotor circuits for locomotion in *Drosophila* larvae.

Ho: specification of body axes in the zebrafish embryo.

Horne-Badovinac: epithelial morphogenesis and organ shape

Imamoto: mouse models of human syndromes that affect craniofacial development.

Kee: regulation of hematopoietic cell development.

Kovar: molecular mechanisms of actin assembly.

Kratsios: molecular mechanisms of motor circuit formation.

Lahn: human evolutionary genetics, genomics, and stem cell biology.

Lynch: genetic basis of evolution of human morphological traits.

Macleod: control of cell cycle and tissue differentiation in mice.

Malamy: molecular regulation of plant root systems.

Moskowitz: developmental genetics of cardiac morphogenesis and congenital heart disease.

Munro: computational and developmental analysis of cytoskeletal dynamics and tissue morphogenesis.

Prince: comparative molecular studies of anterior-posterior patterning in zebrafish and other teleosts.

Ragsdale: pattern formation in the vertebrate brain.

Rebay: transcriptional regulatory circuitries in development and disease; receptor tyrosine kinase signal transduction.

Rosner: signal transduction pathways in cell growth and differentiation, with emphasis on neuronal systems.

Schmidt-Ott: evolution of developmental processes in Diptera.

Schwartz: biosynthesis of connective tissue during embryonic development.

Shubin: evolutionary origin of new anatomical features and faunas.

VanderGriend: prostate stem cells in normal development and in disease.

Wu: somatic stem cells in mammalian skin, and their involvement in tissue homeostasis and skin diseases.

DETAILED DESCRIPTION OF PROGRAM OF STUDIES

Introduction to Research

All first-year students are expected to participate in *Introduction to Research*. This course is designed to provide incoming students with information on a variety of research opportunities available in developmental biology.

Laboratory Rotations

Students undertake short research projects in at least three different laboratories before beginning their dissertation research. Rotations can be performed at any time during the first academic year, and generally coincide with the ten-week academic quarter. The purpose of the rotation is to expose students to different research environments, broaden their acquaintance with useful laboratory techniques, and introduce them to the conceptual framework of experimental design. The faculty member directing the host laboratory will provide the Curriculum Committee with an evaluation of the student's performance at the end of the rotation. These evaluations aid in tailoring the remainder of the student's academic program.

Teaching Assistantships

Teaching and verbal communication are important skills for a successful research career. All students are required to serve as teaching assistants (TAs) for two quarters; DRSB students are expected to perform one TAship in the third year and one in the fourth year. If a student wishes to TA in their second year, they must submit a written request to the Curriculum Committee, signed by their research advisor, in order to obtain approval. Standard TA responsibilities include leading discussion groups, writing problem sets, holding office hours, grading exams and other assignments and running laboratories.. The instructor will evaluate the TA's performance, and these evaluations will become a part of the student's record.

Any student at risk academically or who is behind in meeting program requirements must request permission from the Curriculum Committee prior to undertaking a Teaching Assistantship. Under such circumstances, permission to TA would normally be granted only if it were deemed that TAing a particular course would be beneficial in terms of the student's academic progress.

Vacations

As graduate students who are fully registered and receiving a full stipend for four academic quarters, all students are required to be on campus, in residence, and engaged in study or research during all four quarters, including the summer quarter. During their first year in the graduate program, vacations generally coincide with the university's academic calendar. Prior to joining a laboratory, first year students who wish to take a vacation at other times, including during summer quarter, must obtain the approval of the Curriculum Committee. After joining a laboratory, the amount and the timing of vacation must be agreed upon by a student and his/her advisor.

The Candidacy Examination

The Biological Sciences Division requires that "a general oral or written qualifying examination, separate from course examinations, must be passed by the student upon the major subject offered and such subordinate subjects as may be required by the Department or Committee concerned." In the Committee on Development, Regeneration, and Stem Cell Biology, this examination is administered in two parts. Part I, the Preliminary Examination, takes place at the end of the first year. Part II, the Qualifying Examination, takes place at the end of fall quarter in the second year. It is administered by the student's thesis committee, which is comprised of the advisor and three additional faculty suitable to the field chosen by the student in consultation with his/her advisor, and approved by the Curriculum Committee. At least two members of the thesis committee must have appointments in the Committee on Development, Regeneration, and Stem Cell Biology; the chair of the thesis committee must be someone other than the advisor, and must have an appointment in Development, Regeneration, and Stem Cell Biology.

Any student who has more than one grade of C in the three developmental biology courses, more than one grade of C in the three distributional courses, or who has not maintained at least a B average will not be

permitted to take the Preliminary Examination unless the Curriculum Committee grants a special exemption. At its discretion, the Curriculum Committee may allow a student to postpone the examination for one quarter.

The Preliminary Examination

Students take their Preliminary Examination at the end of June of their first year. The purpose of this exam is to determine students' readiness to start working independently on their doctoral research. The exam presupposes general knowledge in the field of developmental biology, and how genetic, cellular, and molecular techniques are employed within the field. It will test the students' ability to use this knowledge to identify an interesting question from the current literature, and to design experimental hypotheses to advance understanding in the chosen area. Course work during the first year, attendance at seminars, and reading the current literature should be good preparation for the exam.

The format for the exam is a research proposal on a topic chosen by each student. To encourage creativity and independent thinking, the topic should not be closely related to the student's doctoral project or to projects on which they have previously worked, including undergraduate projects and rotation projects. Additional inappropriate projects include those closely related to projects ongoing in rotation labs. Students must identify an important general area in which research is needed, frame an interesting specific research question in that area, design a set of experiments to test one or more explicit hypotheses, and discuss how the potential results will be interpreted. A critical aspect of the exam is understanding the limitations of different approaches and defining alternative, complementary approaches.

After discussing possible topics for their proposal with faculty, students should prepare a specific aims page for their proposal. This document should be one page in length and should include the following items.

- An opening section formulating the overall question that is to be addressed.
- Essential background to set up the question with a defense of the importance of the question.
- A clear and logical "set-up" of the experimental hypotheses to be addressed.
- The proposed specific aims; for each aim, state the hypothesis that is the focus of the aim. The maximum number of specific aims permitted is two; however, since it can be difficult to discuss multiple aims in sufficient depth, students may propose only one specific aim.
- General experimental strategies for each aim.

References should be included; a key, relevant review should be attached as well as a copy of the primary research paper on which the proposal is most closely based. By the end of spring quarter, students will secure approval for their research question and experimental aims from the faculty.

The written proposal should include the student's name and a title and be five single-spaced pages in length, including figures (please follow the NIH format of Arial eleven-point font and half-inch margins). This limit does not include references, for which there is no page limit. The scope of the experiments proposed should be roughly what a graduate student might achieve in three to four years of doctoral research. The proposal should be organized as follows:

- Specific Aims (one page).
- Background. Give a brief introduction, providing only essential background on the topic and elaborate on the significance of and interest in the question and the impact the proposal would have on the field, if successful.
- Experimental Design. Outline the approaches to be used to address the experimental hypotheses. It is important to develop a clear rationale for the experimental design; the minute details of the

experiments are less important. However, it is critical to ensure that the proposed experiments are feasible given the resources and techniques currently available.

- Address possible outcomes, pitfalls, alternative approaches and implications of the results. This can be integrated with the Experimental Design section, or presented separately.

The student will submit the final proposal by email and, if requested, in hard copy to the examining committee and to the Graduate Program Administrator before the exam. To assist the examiners, the student should also provide a copy of the most useful published review of the field and a copy of the primary research paper on which the proposal is most closely based.

The oral exam lasts for approximately 120 minutes. Students should prepare forty minutes of material: they should briefly present the proposal objectives and the motivation for these objectives; two powerpoint slides are allowed. The faculty examiners question the students about the foundation for the question, the potential impact of the question, the experimental hypothesis in each aim, the rationale and feasibility of the experiments, possible interpretations of the experimental results, and alternative approaches that might be important. Because part of the purpose of the exam is to test a student's general knowledge in the area of developmental biology, faculty may also ask general questions to probe the student's knowledge.

The examining committee will evaluate the written document together with the oral presentation, using the following criteria:

1. Knowledge of fundamental ideas and paradigms in developmental biology
 - a. Does the student have sufficient depth of knowledge of the chosen area of her proposal to enable her to understand the current status of knowledge in the field and identify an important question?
 - b. Does the student have knowledge of sufficient breadth to enable him to draw from related fields in the analysis of a given problem?
2. Quality of research strategy posed
 - a. Is the logical structure of the strategy sound?
 - b. Have the possible experimental outcomes been considered and their interpretations relative to the original hypothesis been carefully evaluated?

An important goal of the exam is to provide an opportunity for students to improve their writing skills. In general, students should not be surprised if they are asked to revise the written document after the exam. In the past, students showing deficiency in writing have been required to take a course in writing.

Based upon the student's performance, the examination committee recommends one of the following:

- A. Pass unconditionally
- B. Pass conditionally, with revision of written proposal required. The revised proposal should be submitted within two weeks by email and, if requested, in hard copy to the examining committee and to the Graduate Program Administrator. All members of the examining committee will evaluate the revised proposal. The student will be informed of the final decision one week after submitting the revision.
- C. Pass conditionally, with further course work required in one or two areas.
- D. Unsatisfactory, with the recommendation that the student retake the exam within the quarter.

The Curriculum Committee then meets to consider this recommendation, taking into consideration the student's overall academic performance as well as his/her performance on the examination. Students who perform unsatisfactorily on the exam and are permitted to retake it must do so by the end of the Summer

Quarter. During the interim, students will continue to receive stipend support. The examining committee for the retaken exam will be selected by the Curriculum Committee Chair, and will contain at least one member of the first examining committee and at least one new member.

If the exam is retaken and the student does not pass, the student will be asked to leave the program.

Choosing an Advisor and Forming a Thesis Committee

At the end of the Spring Quarter of the first year of graduate study, the student will choose a research advisor. In the event the student chooses to work with a faculty member who does not have an appointment in the Committee on Development, Regeneration, and Stem Cell Biology, the student must petition the Curriculum Committee for approval.

In consultation with the advisor, the student should formulate a list of four prospective thesis committee members (including the student's advisor), and submit this to the Curriculum Committee for approval. The function of the thesis committee is to monitor the student's progress and to assist the student in the development of his/her dissertation research. For this reason, the choice of the members of the thesis committee should be based on their knowledge and expertise in the area of the student's research. At least two members of the thesis committee must have appointments in the Committee on Development, Regeneration, and Stem Cell Biology. The thesis committee will be chaired by a member of the Committee on Development, Regeneration, and Stem Cell Biology other than the advisor. Once a thesis committee is constituted, its composition can be changed only by petitioning the Curriculum Committee. Such changes may be necessitated by differing circumstances, including a shift in the student's experimental focus or unavailability of a faculty member.

The Qualifying Examination

For the Qualifying Examination, the candidate will prepare a research proposal on the topic planned for his/her thesis research. It is important to note that the Qualifying Exam is not a thesis defense. It does not require preliminary results although, if available, they can be used. The exam tests the student's ability to:

1. Choose a topic - that is, formulate an important biological question (SIGNIFICANCE);
2. Propose a coherent set of avenues to answer the question (SPECIFIC AIMS);
3. Summarize critically the current literature on that topic (BACKGROUND);
4. Describe a series of experiments taking into account possible pitfalls and offer alternative approaches (EXPERIMENTAL METHODOLOGY).
5. Provide references.

The written proposal should be modeled after an NIH grant application. It should consist of specific aims (1 page), background and significance/impact (2-3 pages), and a description of experimental approaches that includes discussion and interpretation of possible outcomes, consideration of limitations of particular approaches, and suggestions of alternative strategies (6-7 pages). These page numbers are guidelines, not strict rules, but the entire proposal must be no more than 10 pages (single spaced, Arial 11 font, 0.5 inch margins). Figures must be included in the body of the proposal, not as additional pages at the end, and count toward the 10- page limit. Figures must be large enough to be legible on a printed page, without additional magnification. References should be placed at the end, and do not count toward

the 10 page limit. Examples of past proposals will be available in the Graduate Program Administrator's office.

The oral exam should be scheduled to take place by mid-December. The written proposal should be submitted to the members of the thesis committee and to the Graduate Program Administrator no later than one week before the oral exam. In the event that circumstances indicate a different schedule and/or the student's thesis committee is unable to meet prior to this time, the student must secure permission to postpone the exam from the Curriculum Committee. **All members of the student's thesis committee must be present for the Qualifying Examination.**

Meetings with the Thesis Committee

Students are required to meet with their thesis committee six-nine months after the Qualifying Examination to assess their initial progress. In their third and fourth years, students must meet at least annually with their committee; starting in their fifth year, meetings should be held every six months to prepare the student for graduation. It is the responsibility of the student to schedule their meetings at the appropriate intervals determined by the DRSB program and their thesis committee. These meetings help to ensure that students are making adequate progress toward completing their dissertation and provide the student with a broader base of expertise on which to draw for help and advice. They also strengthen the student's acquaintance with faculty other than the thesis advisor.

At all meetings, a minimum of three members of the committee must be present, including the student's advisor and the committee chair. If a meeting is to be held in the absence of one or more faculty members, the student should attempt to meet informally with such faculty in order to discuss his/her progress. Students may change the composition of their thesis committee as warranted by changes in their research focus, or other reasons. Students must petition the Curriculum Committee for permission to make such changes.

In these meetings, which are expected to last 90 minutes, the student should give a formal oral presentation that both summarizes their experimental accomplishments since the previous meeting and outlines planned future directions. These oral presentations should be 20-30 minutes long to allow ample time for questions and discussion. The intent of these presentations is not to show the committee the result of every experiment the student has performed since the last meeting, but rather to highlight recent findings of particular significance to the project and to seek advice, both technical and intellectual, when stumbling blocks have been encountered in the project. It is critical that the planned presentation allow ample time for a thorough discussion. The student is strongly encouraged to consult with their advisor in advance of these meetings to come up with a plan that will maximize the benefit of the meeting to the student's research progress.

One week prior to the meeting, the student should submit to committee members and to the Graduate Program Administrator an updated curriculum vitae and a written report of experimental progress since the last meeting as well as future objectives; the report should be two to four pages in length. The report should include the original aims and a discussion of how the original aims have been modified, if applicable. The report should also contain descriptions of experiments focused on these aims and, in particular, the data to be discussed at the meeting. Students are also encouraged to define in a summary statement the issues that would most benefit from the committee's input. For all meetings in the 4th year of study, and beyond, the student must also submit a separate one-page document that outlines their publication plans. For each planned publication, the student should provide a title and a list of projected figures, indicating which data are in hand and which experiments still need to be completed. These outlines are intended to help the student organize their research efforts and to start thinking about publication plans early on in their project. A copy of all written documents should also be submitted to the Graduate Program Administrator.

At the beginning of each committee meeting, the mentor provides a review of the student's progress. The student is not present for this review. At the conclusion of the meeting, the committee will briefly discuss specific recommendations and will then relay these to the student. Following the meeting, the chair of the committee will provide a brief written report summarizing the discussion. At the very end of the meeting, the advisor will be asked to leave the room, and the student will be offered the opportunity to speak with the committee in the absence of their advisor.

Fifth Year Meeting with Advisor

All graduate students in the Biological Sciences Division are strongly encouraged to conclude their doctoral research within six years. The fifth year meeting is designed to help students and advisors realize this goal. At the beginning of the student's fifth year in the graduate program, prior to their thesis committee meeting, students will meet with their advisors to develop a plan for completing the dissertation. The plan will include intended completion dates for experiments to be performed and proposed manuscripts to be written. The plan will be submitted to the student's thesis committee for approval at the committee meeting. Members of the thesis committee must approve the proposed plan or an appropriately amended version, as realistic and suitable. The final, approved plan will be submitted together with the standard thesis committee report after the annual meeting, and will be included in the student's permanent file.

Publication Requirement

To receive a Ph.D., DRSB students are required to publish a minimum of one first author peer-reviewed paper. Equal co-first authorships can also meet this requirement. This requirement formalizes the expectation that every DRSB doctoral student will make an original contribution to the scholarship in his/her field. Additionally, the requirement ensures training in fundamental aspects of our discipline: preparing a manuscript for submission to a journal, replying to reviewer comments, and finalizing the manuscript for publication.

At the penultimate meeting, the student's thesis committee will assess whether the student's publication record is sufficient to meet this requirement, prior to their granting approval for the student to write their thesis. Students may request an exception to the publication requirement by petitioning the Curriculum Committee. Letters from both the advisor and the chair of the thesis committee supporting and explaining the reason for the exception must be included with the petition. If either the advisor and/or the committee chair are members of the Curriculum Committee, additional DRSB faculty member(s) will be recruited on an ad hoc basis to consider the case.

Penultimate Meeting with the Thesis Committee

After completing a significant body of experimental work, the student should seek permission from the thesis committee to write and defend his/her dissertation. One week prior to this meeting, the student should submit to the committee members an outline of their proposed dissertation. This outline should be as detailed as the student can make it, and should include a list of ongoing experiments to be completed before the defense, a list of the chapters and the topics to be covered within each chapter, and a list of figures and tables for each chapter. **All committee members must be present for this meeting, without exception.** If this condition cannot be met, the student must consult the Curriculum Committee to determine alternative procedures. At the meeting, the mentor should review the student's overall progress in the program. The student is not present for this review. This is followed by a presentation from the student that reviews finished or published work and details ongoing experiments to be completed for the dissertation. After a discussion with the committee members, the chair of the thesis committee should prepare a written recommendation providing approval to the candidate to write and

defend the dissertation. The recommendation may include specific guidelines for unfinished experiments as well as for the structure and content of the dissertation. **This report must be signed by all committee members as well as the faculty mentor.** Approval to write and defend the dissertation does not constitute its acceptance.

Presentation of the Dissertation

Finally, each graduating student writes a dissertation describing his or her research, presents the work in a public seminar, and defends it in front of a faculty examining committee.

The dissertation must be distributed to the thesis committee at least **two weeks** before the final examination. Announcement of the thesis defense will be posted one week before the defense date. The final exam committee consists of at least four faculty members, three of whom must be members of the student's doctoral committee and at least two of whom are members of the faculty of the Committee on Development, Regeneration, and Stem Cell Biology. A dissertation is not acceptable if more than one member of the examining committee abstains or votes against acceptance. In such a case, the examining committee will advise the student and the Chair of the Committee of any additional work that must be completed.

The University has strict rules concerning the preparation of the dissertation. Detailed information is provided on the Dissertation Office website, <http://www.lib.uchicago.edu/e/phd/>. The final dissertation must be submitted to the Dissertation Office no later than three weeks before the date of the convocation. Once the dissertation has been submitted, the Chair of the graduate program must approve the thesis and the departmental approval form must be submitted to the Dissertation Office.

REGISTRATION

General Information

About one week before the dates designated for registration, the Graduate Program Administrator will inform all students of the days and times to register online. Special registration procedures have been established for the first year students in the Fall quarter. During Orientation Week, members of the Curriculum Committee and the Graduate Program Administrator will discuss program procedures with entering first year students. The students will then meet with members of the Curriculum Committee to map out a program of study for the first year. If necessary, second year students will also meet with members of the Curriculum Committee to review their progress in the preceding year and to discuss further degree requirements.

Registration

All students will be registered in a single doctoral registration status referred to simply by the year of study (e.g., PhD1, PhD2, PhD3).

Leave of Absence

During Scholastic and Advanced Residence, a student may, if necessary, apply for a Leave of Absence from the Ph.D. program to be approved by the Curriculum Committee and the Departmental Chair. Only students who are in good academic standing will be granted a Leave of Absence.

PRO-FORMA REGISTRATION

Students whose dissertation research requires residence away from Chicago may register pro

forma. Pro-forma status establishes a good faith relationship between the student and the University. The following regulations apply:

1. Pro-forma registration is approved for only one academic year at a time, and the maximum pro-forma enrollment allowed is eight quarters.
2. Applications for pro-forma registration must be approved in writing by the Chair of the Committee, whose signature means that the student's work away from Chicago is recognized as essential to the dissertation, and by the Office of Graduate and Postdoctoral Affairs. Normally, students applying for pro-forma status will have been admitted to candidacy and have had dissertation topics approved.
3. An applicant for renewal of pro-forma status must show the Committee Chair that good use has been made of the time already spent "on location" and that additional time is essential to completing the original task. Renewals of pro-forma status must be approved by the Office of Graduate and Postdoctoral Affairs.
4. A student on pro-forma status may not be gainfully employed for more than 19 hours a week.
5. Pro-forma students may not use the facilities of the University or the time of its faculty, except for progress reports that may be required by the students' program.
6. The Registrar will certify that a pro-forma student is duly registered at the University to any agency requiring such certification.
7. The fact that a registration is pro-forma will be noted on the student's academic record.
8. Pro-forma registrations do not count toward satisfying a student's residence requirements toward a degree.

Visiting Non-Degree Students

Students who have moved to the University with their advisor but who are still registered at their home institution are given the status of Visiting Non-Degree Students. This gives them access to the libraries and to athletic facilities while they are completing their degrees.

FINANCIAL SUPPORT

The Committee attempts to ensure that all DRSB students are provided with adequate financial aid. Financial aid is guaranteed to all incoming students for their first five years, subject to satisfactory academic performance. Support for subsequent years of study is subject to the student's satisfactory research progress, as determined by the faculty sponsor, the program, and the Division of Biological Sciences.

Through their sixth year in the program, students will automatically receive any divisionally approved increase in stipend amount. Students in their seventh year and beyond will not receive these stipend increases.

SOURCES OF SUPPORT

Students receive tuition plus a stipend. The various sources of support are:

- divisional funding
- training grants

- external fellowships
- research assistantships

Payment of Stipend Checks

Divisional funding and NIH checks are paid in equal quarterly installments at the beginning of each quarter and cover the calendar year. Research Assistant Type B (RA-B) students are paid on a monthly basis on the last working day of each month. Taxes will be deducted from this amount. RA-B students are responsible for paying their health insurance and fees from their salary each quarter. If the student prefers, an automatic quarterly deduction can be arranged through the Dean of Students Office to cover health insurance and the health fee for three quarters; the deduction is not available in Summer Quarter. Tuition is paid by the advisor, department, or division.

Taxes

Graduate student stipends are taxable by Illinois and the Federal government. Students on fellowships and NIH training grant support must calculate and pay estimated taxes several times a year. The following IRS forms provide information on determining what portion of your stipend is taxable and how and when to pay taxes you owe:

Tax Benefits for Education, PUB 970

US Tax Guide for Aliens, PUB 519

US Tax Treaties, PUB 901

These forms are available from the IRS. Regenstein Library also carries tax forms, particularly after January 1st. For more information, please refer to the Internal Revenue website: Taxable income for students (<http://www.irs.gov/Individuals/Students>).

Loans

For information on the various types of loans that are available to graduate students, you should consult the Student Loan Administration Office (Bookstore Building, 970 E. 58th St., Suite 411, 702-6061). This office can provide short-term loans during temporary financial crises (for example, if a stipend check is delayed or if you are transferring from a fellowship to an assistantship). The office also has up-to-date information on federally-sponsored student loan plans.

Supplies and Research Expenses

In general, costs of research supplies and equipment are covered by grants or contracts held by the faculty member in whose laboratory you are working. Limited supply funds are available on training grants, and are disbursed on an annual pro-rated basis, directly to the laboratories in which trainees are working.

Students supported on training grants have small annual allowances for supplies. Students must usually be in their second year of support to receive an allowance. Requests for supplies are handled by the training grant administrator.

Travel to Scientific Meetings

Attendance at scientific meetings is an important part of the educational process. Limited travel funds are available on training grants, and are distributed by the training grant administrator to students who request them, with preference given to students who have passed the Preliminary Exam. Funds are only

given to students scheduled to present a paper or a poster at the meeting.

Should you wish to apply for such support, you should submit a formal request (with your advisor's approval) in writing to the grant administrator, supplying the following information: purpose of meeting and relevance to the research; title, place and time of the meeting; (if applicable) title and authors of paper being presented; amount requested for travel, registration fees, food, and lodging.

MISCELLANEOUS INFORMATION

Curriculum Committee

This faculty committee is responsible for advising all students during the first year of graduate study or until a research advisor has been chosen. Each student will be assigned a member of the Committee to serve as temporary advisor during this time and to aid in selecting courses and arranging lab rotations. This Committee conducts a quarterly review of each student's course performance and administers the Preliminary Examination. Members of the Curriculum Committee meet with first-year students each quarter to discuss any issues concerning the first-year curriculum or other topics of concern.

Graduate Program Administrator

The DRSB Graduate Program Administrator provides assistance to students on a variety of questions and problems as they arise. The office is located in CLSC 1105B, and the phone number is 702-8037.

DRSB Student Representatives

Students who have finished their first year of study are eligible to serve as student representatives. They help to organize a variety of student activities under program auspices, such as student recruitment events and the annual Retreat. Representatives typically serve for two years.

Scientific Ethics Course

A course on scientific ethics is offered in Spring Quarter. All first year students are required to register for and attend the course.

Senior Ethics Course

All students in their fourth year and beyond are required to register for and attend a course on scientific ethics for senior students. The course is offered in Spring Quarter.

Seminars

In addition to formal courses and seminars, there are many regularly scheduled research seminars that will help to keep students up-to-date on new developments in developmental biology, molecular genetics, cell biology, and related disciplines.

One seminar in particular deserves special note: on Fridays at 5:00 p.m. in CLSC 101, students and postdocs gather for an informal seminar, Graduate Student Seminar (GSS). Beer, soda, and food are provided. The format is for a student to give a one hour presentation on his or her research.

Seminars sponsored by the Molecular Biosciences cluster are usually held on Tuesdays at 4:00 p.m., except for Human Genetics, which holds its seminars on Wednesdays.

The schedule is as follows:

GGSB, 1st Tuesday, CLSC 101
BMB, 2nd Tuesday, GCIS 301
DRSB, 3rd Tuesday, CLSC 101
CMB, 4th Tuesday, CLSC 101
Human Genetics, one or two Wednesdays each month, KCBD 1103

Other seminar series of interest include:

Cancer Biology
Various Fridays, 12:00 noon, KCBD 1103

Ecology and Evolution
Mondays, 3:30 p.m., KCBD 1103
<http://pondside.uchicago.edu/ee>

Darwin's Weekly
Tuesdays, 12:00 noon, Lillie Room, Z 212
<http://pondside.uchicago.edu/ee>

Immunology
Mondays, 4:00 p.m., BSLC 115

Committee on Neurobiology and Committee on Computational Neuroscience Seminar Series:
Thursday 12:00 noon, BSLC 205
<http://neuroscience.uchicago.edu/events/>

Chemistry
Mondays, 4:00 p.m., Kent 120

Institute for Genomics and Systems Biology
Second Thursdays, 4:00 p.m., KCBD 1103

Evolutionary Morphology
Thursdays, 7:30 p.m., Hinds 176
<http://evbio.uchicago.edu>
Contact: Libby Eakin, eakin@uchicago.edu

Microbiology
Wednesdays, 12:00 noon, CLSC 11

Seminar notices are posted on the bulletin board on the first floor of Cummings as well as other floors, and in the GCIS.

The Biological Sciences Learning Center and Jules F. Knapp Medical Research Building

This complex is located at the northern end of the Science Quadrangle. The Learning Center provides classrooms, laboratories, and research facilities for undergraduate, graduate, and medical programs. The Knapp Building houses faculty members in the areas of molecular cardiology, immunology, oncology, and neurobiology. In addition, the Office of Graduate and Postdoctoral Affairs for the Division of Biological Sciences is located in the Learning Center.

The Gordon Center for Integrative Science

The Center, a \$200 million, state-of-the-art interdisciplinary research facility uniting scientists in the Biological Sciences Division and the Physical Sciences Division, is located at the northwestern end of the Science Quadrangle. This is the largest research facility on the campus, housing 700 investigators and students under one roof.

Knapp Center for Biomedical Discovery

Located adjacent to the Learning Center, the KCBD, houses laboratories and office space for principal investigators, postdoctoral students, and graduate students in the departments of medicine and pediatrics, as well as the Cancer Research Center.

Libraries

The John Crerar Library (5730 South Ellis Avenue) combines the University collections in biological sciences, medicine, and the physical sciences. Users with valid University of Chicago ID's or Library cards have access to all floors and stack areas during all library hours. The library is adjacent to the Cummings Life Science Center and is connected by tunnel to Cummings, the Kovler Viral Oncology building, the Gordon Center for Integrative Science, and the Medical Center.

The first floor of Crerar contains the major service units. The Circulation Desk (702-7409) is located to the left of the entrance atrium. Reserve materials for all science courses except math, computer science, and statistics are held at the Circulation Desk, as well as a permanent reserve collection of current medical textbooks and very heavily used science periodicals. The Science Reference Department is located to the right of the entrance atrium, together with the science microforms.

The website for the University of Chicago Libraries is www.lib.uchicago.edu.

Bursar's Office

The Bursar's Office, located in on the third floor of the Bookstore at 970 E. 58th St., is open from 9:00 a.m. to 4:00 p.m., Monday through Friday. Students may contact the following Bursar's Office numbers for information:

Tuition Inquiries 702-7086

Bursar Restrictions 702-7086

Other Information 702-8000

For the website, go to: <http://bursar.uchicago.edu/students>.

Student Health Services

Student Health Services provides health care to all registered students in the University. It is funded by a mandatory quarterly student health fee. Payment of this fee allows the student access to the University's student health services. Some specialized and emergency care is not covered, nor does the fee include the cost of outside referrals, laboratory tests, and hospitalizations.

In addition to participation in Student Health Services, all students are REQUIRED to carry a health insurance plan (either university student health insurance or comparable insurance) to cover the costs of hospitalization, outpatient diagnostic and surgical procedures, laboratory tests and catastrophic illness. Charges for university insurance are assessed for each of three quarters (Fall, Spring, Winter); there is no charge for coverage for the Summer Quarter. More information about the university insurance can be found on the web, wellness.uchicago.edu

Students with comparable group insurance coverage through a parent's, spouse's, or their own policy may request that participation in the university program be waived. However, they must cover the cost of alternative health insurance out of their own pocket.

The Student Health Service is located at 860 E. 59th St., Suite R100. Hours are 8:00 a.m. to 6:00 p.m., Monday-Thursday, 8:00 a.m. to 5:00 p.m. on Friday, and 9:00-1:00 p.m. on Saturday. Saturday, SHS is in DCAM, Suite 3B, 8:00 a.m. to 11:00 a.m. Please note that there are no walk-ins, so you must make an appointment: call 702-4156. If you need emergency medical advice after SHS business hours, or if you need emergency medical advice during business hours or want to review an acute medical problem, contact the Nurse Advice Line at 702-1915. The nurse can provide time-saving advice and assistance and help you to determine if you need immediate medical treatment. For other services and phone numbers, please visit the website at wellness.uchicago.edu

The Student Counseling Service is located at 5555 S. Woodlawn Avenue, and is open from 8:30 a.m. to 5:00 p.m., Monday through Friday. It specializes in diagnostic evaluation, psychotherapy and emergency services for all students, as well as services for students who are experiencing difficulties in studying and learning and difficulty in managing time commitments. For an evaluation, outside referral, or assignment to a therapist call 702-9800 to schedule an appointment. Emergencies are taken immediately during regular hours. During evenings and weekends, a therapist is available by calling 702-3625. For all services and phone numbers, please go to wellness.uchicago.edu

Computing Facilities

Information Technology Services (IT Services) runs computing facilities in Regenstein (first floor). The facilities provide access to a variety of up-to-date computing equipment. Students may get additional information and apply for personal computing accounts online at <https://itservices.uchicago.edu/welcome/students>.

Email accounts

All students must establish uchicago email accounts and check their accounts regularly. Email accounts can be set up online at <https://itservices.uchicago.edu/email>.

Keys

The MGCB Department Office (CLSC 1106) issues keys needed by those working in the Cummings building. Graduate students may obtain laboratory keys from the receptionist.

Mail

The Cummings Mailroom is located in CLSC 108. Beginning students share mailbox number 60 and may also receive mail at their rotation lab; advanced students receive mail in their appropriate lab boxes.

Copying, Printing and Scanning

Copy, print, and scan stations are located in the Crerar and Regenstein libraries. The cost varies and a UChicago Card or campus card is required; no machine takes cash. For more information, see <https://printing.uchicago.edu>.

MGCB has a photocopying/scanning machine in CLSC 1106. You must set up an access account through the Departmental Office.

Lost and Found

Most University buildings have their own lost and found location. For the libraries, go to <http://www.lib.uchicago.edu/e/using/lost-found.html>. For the Reynolds Club at 57th and University, call 2-8787. For the Medical Center at 58th and Maryland, call 2-6262; for Admissions at 58th and University call 2-8650.

Parking

You may obtain an assigned parking space on campus by paying a monthly fee. Information about current fees and how to apply for a parking assignment is available at http://safety-security.uchicago.edu/services/campus_parking.

For space in the multi-level parking garage at 5840 S. Maryland Ave., you must apply to the Hospital Parking Office located in the garage, 702-4381.

Transportation

Campus Bus

The Chicago Transit Authority (CTA) provides bus service for Hyde Park and Kenwood. The routes are as follows:

#171 U. of Chicago/Hyde Park: Services Lake Shore Drive/54th Street and the 55th-56th-57th Street Metra station. This route travels to campus on 55th Street and Ellis Avenue and then circles campus. This route operates weekdays from 7:02 a.m. to 6:32 p.m.; weekends from 8:00 a.m. to 6:37 p.m. After Summer Convocation, a reduced service schedule goes into effect.

#172 U. of Chicago/Kenwood: Services Lake Shore Drive/50th Street and the Hyde Park-53rd Street Metra station. This route travels to campus on Hyde Park Boulevard and Ellis Avenue and then circles around campus. This route operates weekdays from 7 a.m. to 6:37 p.m.; weekends from 8 a.m. to 6:37 p.m. After Summer Convocation, a reduced service schedule goes into effect.

#192 U. of Chicago Hospitals Express: Provides express service to/from downtown to Harper Court, campus, and the medical center. Southbound service is from 6:30 a.m. to 9 a.m., northbound service is from 3:45 p.m. to 7 p.m.

For more information, see <http://safety-security.uchicago.edu/transportation/>

Students ride the #171 and 172 free with a UCID; regular CTA fares apply for the #192 (full fare, \$2.25).

The University also operates a free evening bus service, Nightride, consisting of four routes that cover the Hyde Park-Kenwood neighborhood. The buses operate on approximately 20-minute schedules between 5 p.m. until about 4 a.m. Sunday through Wednesday, and until 6 a.m. Thursday through Saturday. They depart from in front of the Regenstein Library, the Ellis Parking Garage, or on University Avenue across the street from the Reynolds Club. During University breaks and Summer Quarter, the service runs until 1 a.m.

Umbrella Service

Umbrella Service is not a transportation service - it is an escort service offered by University Security. An individual or group may call Security at 702-8181, and request a patrol car to accompany them from their place of departure to their destination anywhere within Hyde Park. This service is extremely useful late at night and/or if minibuses have stopped running. You may contact Security on emergency phones throughout the campus and Hyde Park. Security, however, prefers that people only use these phones when absolutely necessary. Students consider this to be an excellent service. It's really a good idea to utilize it so that it continues to be offered.

RECREATION ON AND NEAR CAMPUS

There are two main student centers. The Reynolds Club, at 57th and University, includes Hutchinson Commons, home of the largest cafeteria on campus; Einstein's Bagels; the North Lounge; automatic teller machines (in the basement area); and a variety of recreation rooms. For more information, visit <https://studentactivities.uchicago.edu>.

The Gerald Ratner Athletic Center is a 15,000-square-foot, state-of-the-art athletic and recreational facility. With its fitness center, gymnasiums, dance room, classrooms, 50-meter swimming pool, ball courts and more, it is designed to support the university's various sports teams as well as the fitness needs of other users. Graduate students receive membership for free. During the academic year, the center is open from 6 a.m. to midnight on Monday to Thursday, 6 a.m. to 9 p.m. on Friday, and 8 a.m. to 9 p.m. on Saturday. For additional information about this facility visit their website: <http://athletics.uchicago.edu/facilities/facilities/ratner/index>.

Ida Noyes Hall, on 59th Street between Woodlawn and Kimbark, was modeled after an English manor house. It houses the Max Palevsky Cinema, a 500-seat theater, home of Doc Films. For more information, visit <http://docfilms.uchicago.edu>. Ida Noyes also contains The Pub, the office of Career Advancement, and the *Maroon* office.

Chicago At Large

Chicago is a fantastic city for music, theatre, and dining out. The Chicago Symphony, the Lyric Opera, Music of the Baroque, jazz, and blues clubs, The Goodman Theatre, and off-loop theatres are all excellent. Both inexpensive ethnic restaurants and expensive special-occasion restaurants abound.

Information on events in Chicago is plentiful. Check out the Explore Chicago pages on the University of Chicago website (visit.uchicago.edu/page/explore-chicago), or <http://chicago.citysearch.com>. One of the best print sources is the monthly Chicago Magazine, available at most newsstands. Chicago Magazine rates restaurants, compiles a complete calendar for the coming month, and generally includes a feature or two on getting the most out of the city. The Friday and Sunday Sun-Times and Tribune have good sections on the week's events. In addition, The Reader has the best information on music, movies, dance and shows. It is available free in the Reynolds Club, delivered Thursday night or Friday morning.

Festivals and Exhibits

The following is a brief list of "don't miss" outdoor concerts, cultural festivals and art exhibits all over town.

Most events will be listed on the City of Chicago's events website at: www.explorechicago.org

Ravinia Music Festival - all summer long, a wide variety of music - Chicago Symphony Orchestra, jazz, country, and more in a beautiful outdoor park, www.ravinia.org, 847/266-5000.

57th Street Art Fair - First weekend in June. 57th Street and Kimbark Avenue, www.57thstreetartfair.org, 773/234-3247.

Old Town Art Fair - Mid June. 1800 block of Orleans Street and Lincoln Park West and adjacent Menomonee, North Park and Wisconsin Streets. www.oldtowntriangle.com, 312/337-1938.

Chicago Blues Festival - Held the 2nd weekend in June in Grant Park - Petrillo Music Shell. World famous blues sounds of "Sweet Home Chicago" as well as showcasing talent from coast to coast. For more information, go to www.cityofchicago.org

Chicago Gospel Festival - At Grant Park in the Petrillo Shell in June. World's largest free outdoor gospel festival. For more information, go to www.cityofchicago.org

Printer's Row Lit Fest - On South Dearborn between Polk Avenue and Congress Parkway, in June. Old, new, rare, antique and special books are for sale by booksellers in historic Printer's Row. Sponsored by the Chicago Tribune, printersrowlitfest.org, 312/222-3348.

Grant Park Music Festival - In June, July and August: America's largest free Symphonic Music Festival featuring international soloists and conductors with the Grant Park Symphony Orchestra and Chorus. Visit www.grantparkmusicfestival.com.

Taste of Chicago - Held in July in Grant Park, the Taste is a premier outdoor food festival showcasing Chicago's dining diversity; there are nightly concerts at Petrillo Music Shell and live broadcasts from major radio stations. Find more information at www.cityofchicago.org

Air and Water Show - Spectacular entertainment in the air and on the water at the North Avenue Beach in July or August. Features military and civilian air and water craft. Find more information at www.cityofchicago.org.

Buckingham Fountain - Located on Congress and Lake Shore Drive. The fountain is turned on April 1st and runs daily from 8:00 a.m. to 11:00 p.m. until mid-October, depending on weather. Water display every hour on the hour for 20 min; color and music show between dusk and 10:20 p.m.

Chicago Jazz Festival - Labor Day weekend in Grant Park. This event highlights Chicago's rich jazz tradition. Find more information at www.cityofchicago.org

Chicago International Film Festival – In October at various Chicago theaters. This event features films from 40 countries. Go to www.chicagofilmfestival.com

The following websites may also be useful:

The Chicago Convention and Tourism Bureau:
www.choosechicago.com

Special Events Management:
www.chicagoevents.com

The Chicago Park District
<http://www.chicagoparkdistrict.com>

Metromix:
<http://chicago.metromix.com>

The Chicago Tribune:
www.chicagotribune.com/entertainment

The Chicago Sun Times:
<http://www.suntimes.com/entertainment>
The Chicago Reader:
<http://www.chicagoreader.com>

Chicago Magazine:
<http://www.chicagomag.com>

Chicago Athlete Magazine:
www.mychicagoathlete.com

The Chicago Symphony Orchestra
<http://www.cso.org>

The Chicago Music Guide
<http://www.chicagomusicguide.com>

The Museum of Science and Industry
<http://www.msichicago.org>

The Field Museum
<http://www.fieldmuseum.org>

The Adler Planetarium
<http://www.adlerplanetarium.org>

John G. Shedd Aquarium
<http://www.sheddaquarium.org>

The Art Institute
<http://www.artic.edu>

Kohl's Children Museum
<http://www.kohlchildrensmuseum.org>

Lincoln Park Zoo
<http://www.lpzoo.com>

Brookfield Zoo
<http://www.brookfieldzoo.org>

Navy Pier
<http://www.navy pier.com>

Center Stage
<http://centerstagechicago.com/events>

Broadway in Chicago
<http://www.broadwayinchicago.com>

The League of Chicago Theatres
<http://www.chicagoplays.com>

The Goodman Theatre
<http://www.goodmantheater.org>

Steppenwolf Theatre
<http://www.steppenwolf.org>

**COMMITTEE ON DEVELOPMENT, REGENERATION, AND STEM CELL BIOLOGY
ADDRESS LIST**

<u>Name</u>	<u>Location</u>	<u>Phone</u>
<u>BSD</u>		
Polonsky, Kenneth S., Dean	AMB S106	2-9000
Humphrey, Holly J., Dean of Students for the Pritzker School of Medicine	BSLC 104	2-1939
Prince, Victoria, Associate Dean of Students for the Graduate School	BSLC 104	5-9890

<u>COMMITTEE</u>		
Ilaria Rebay, Chair	GCIS W340	2-5753
Graduate Program Administrator, Kristine Gaston	CLSC 1105B	2-8037
Graduate Student Information	CLSC 1105B	2-8037
Cunningham, John	KCBD 5114	2-1205
Dawson, Glyn	WCH C490	2-6430
De Jong, Jill	KCDB 5120	2-2646
Du, Wei	JFK R314	2-4652
Fehon, Richard	CLSC 925B	2-5694
Ferguson, Edwin	CLSC 921A	2-8943
Gilad, Yoav	CLSC 325C	2-8507
Glotzer, Michael	CLSC 901	4-7394
Green, William	Ab 412	2-1763
Gross, Martin	WCH C608	2-1241
Grove, Elizabeth	Ab 220	2-9909
Haselkorn, Robert	CLSC 1039A	2-1069
Heckscher, Ellie	CLSC 915E	4-1376
Ho, Robert	CH 305	4-8423
Horne-Badovinac, Sally	CLSC 855	4-1471
Imamoto, Akira	GCIS W428	4-1258
Kee, Barbara	AMB S310	2-4349
Kovar, David	CLSC 212	4-2810
Kratsios, Paschalis	Ab 412	2-7442
Lahn, Bruce	GCIS W504	4-4393
Lynch, Vincent	CLSC 319C	4-1326
Macleod, Kay	GCIS W338	4-7414
Malamy, Jocelyn	EBC 203	2-4651
Moskowitz, Ivan	KCBD 5124	4-0462
Munro, Ed	CLSC 218B	2-6221
Prince, Victoria	CH 205	4-2100
Ragsdale, Cliff	Ab 216	2-9609
Rosner, Marsha	GCIS 421C	2-0380
Schmidt-Ott, Urs	CLSC 921B	4-9798
Schwartz, Nancy	WCH C519A	2-6426
Shubin, Neil	CH 106	4-7472
VanderGriend, Donald	BSRP J650	2-2260
Wu, Xiaoyang	GCIS W408B	2-9994

OTHER UNIVERSITY OFFICES

Main Number - University	702-1234
Main Number - Hospitals	702-1000
Campus Police	702-8181 (Call 123 from any University phone)