DEPARTMENT OF
ORGANISMAL BIOLOGY AND ANATOMY

Graduate Program in Integrative Biology

Graduate Student Handbook
2021-2022
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_Please note: The guidelines and policies in this handbook are expected to be normal practice. If reasonable exceptions arise, errors are found, or conflicting information is offered by students, faculty, or staff, please contact the Director of Graduate Studies for clarification and resolution._
INTEGRATIVE BIOLOGY TRAINING PROGRAM ADMINISTRATION

Organismal Biology & Anatomy Department Staff

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<th>Staff Role</th>
<th>Name</th>
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<th>E-mail</th>
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<tbody>
<tr>
<td>Chair</td>
<td>Robert Ho</td>
<td>Culver 305</td>
<td>4-8423</td>
<td><a href="mailto:rkh@uchicago.edu">rkh@uchicago.edu</a></td>
</tr>
<tr>
<td>Director of Graduate Studies</td>
<td>Mark Westneat</td>
<td>Culver 103</td>
<td>2-2412</td>
<td><a href="mailto:mwestneat@uchicago.edu">mwestneat@uchicago.edu</a></td>
</tr>
<tr>
<td>Executive Administrator</td>
<td>Joe Bernstein</td>
<td>Anatomy 106</td>
<td>4-8175</td>
<td><a href="mailto:jbernst@uchicago.edu">jbernst@uchicago.edu</a></td>
</tr>
<tr>
<td>Human Resources Administrator</td>
<td>Annetha Bartley</td>
<td>Anatomy 106</td>
<td>4-0461</td>
<td><a href="mailto:annetha@uchicago.edu">annetha@uchicago.edu</a></td>
</tr>
<tr>
<td>System Administrator</td>
<td>Mike Guerra</td>
<td>Zoology 003</td>
<td>2-9011</td>
<td><a href="mailto:guerra@uchicago.edu">guerra@uchicago.edu</a></td>
</tr>
<tr>
<td>Hull Court Building Manager</td>
<td>Max Zmija</td>
<td>Culver 006</td>
<td>2-2183</td>
<td><a href="mailto:mzmiija15@bsd.uchicago.edu">mzmiija15@bsd.uchicago.edu</a></td>
</tr>
<tr>
<td>Operations Assistant</td>
<td>Cindy King</td>
<td>Anatomy 106</td>
<td>2-8087</td>
<td><a href="mailto:cking@uchicago.edu">cking@uchicago.edu</a></td>
</tr>
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Office of Graduate Affairs—Biological Sciences Division (BSD)

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Office</th>
<th>Phone</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean &amp; Director, OGPA</td>
<td>Victoria Prince</td>
<td>BSLC 104</td>
<td>4-2100</td>
<td><a href="mailto:vprince@uchicago.edu">vprince@uchicago.edu</a></td>
</tr>
<tr>
<td>Associate Dean, OGPA</td>
<td>Diane J. Hall</td>
<td>BSLC 104</td>
<td>5-3849</td>
<td><a href="mailto:d-hall@uchicago.edu">d-hall@uchicago.edu</a></td>
</tr>
<tr>
<td>Student Affairs Administrator</td>
<td>Melissa Lindberg</td>
<td>BSLC 104</td>
<td>2-3905</td>
<td><a href="mailto:mlindber@bsd.uchicago.edu">mlindber@bsd.uchicago.edu</a></td>
</tr>
<tr>
<td>Director of Graduate Education</td>
<td>Audrey Aronowsky</td>
<td>Zoology 110</td>
<td>2-3891</td>
<td><a href="mailto:aronowsky@uchicago.edu">aronowsky@uchicago.edu</a></td>
</tr>
<tr>
<td>Grad Education Administrator</td>
<td>Marcy J. Hochberg</td>
<td>Culver 401</td>
<td>2-9474</td>
<td><a href="mailto:mhochberg@uchicago.edu">mhochberg@uchicago.edu</a></td>
</tr>
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</table>

Fax Machine for student use is located in:

Anatomy 106 (Office hours only) 773-702-0037

Relevant Seminars for IB Graduate Students

All Integrative Biology students are included on the student email list (obastu@lists.uchicago), and are automatically subscribed to announcements for the Natural History and E&E weekly seminar series. Others seminars of potential interest to OBA students are listed below.

Evolutionary Morphology evmorph@lists.uchicago.edu
Integrative Neuroscience, CNS, and Neurobiology Seminar announcements synapse@lists.uchicago.edu
MGCB Seminar announcements mgeb_seminars@lists.uchicago.edu
Animal Behavior Brown Bag Seminar behavior_seminar@lists.uchicago.edu
Computational Neuroscience Journal Club cns-ic@lists.uchicago.edu
Remote Learning in a time of COVID-19

Due to the unprecedented impact of COVID-19, autumn quarter classes at the University of Chicago will be conducted either fully online, or using a hybrid model that allows for limited in-person class meetings, by utilizing building space that can safely accommodate learning while maintaining social distancing.

Additionally, UChicago and the Biological Sciences Division have created a number of webpages and online resources to help you:

- develop and strengthen your skills with remote learning;
- stay up-to-date on public health information relating to COVID-19, research safety, and campus health and well-being;
- familiarize yourself with campus supports and resources so you can navigate the 2021-2022 academic year successfully

We encourage you to explore these resources. If you have any questions, please do not hesitate to reach out to the Director of Graduate Education, or the Graduate Education Administrator, for assistance.

A few sites to get you started:

- UChicago Forward (https://goforward.uchicago.edu/) – Planning the Resumption of Programs and Operations on Campus
  This site provides up-to-date information on university health requirements related to COVID-19, status of campus building, FAQs, planning updates for research and educational activities, as well as links to recent town halls and more.
- Coronavirus updates (https://coronavirusupdates.uchicago.edu/) – Information on coronavirus safety, travel planning and restrictions, Autumn Quarter 2020 plans, public health information, and details on how to protect yourself.
- Learning Remotely (https://learningremotely.uchicago.edu/)
  This site includes basic information on tools used in remote instruction and accessing training; developing learning strategies tailored to your learning style; learning resources – within and outside the classroom – to support remote learning; FAQs addressing common questions.

IMPORTANT: Before Arriving on, or Returning to, Campus

Each member of the UChicago community is required to attend an online COVID-19 training program and acknowledge via an online form that they will comply with the University's COVID-19 health requirements.

Following are links to help you complete required action, in order to be able to come to campus:

- Access COVID safety training and complete electronic COVID Heath Requirements form (https://goforward.uchicago.edu/health-requirements/)
- Download the UChicago Health Pact PDF
Integrative Biology Degrees

The Department of Organismal Biology and Anatomy grants both Doctor of Philosophy (PhD) and Master of Science (MS) degrees in Integrative Biology, but students are admitted with the understanding that they are working towards the PhD degree.

IB Programs

The IB graduate training program emphasizes an integrative approach to biology, and most of its faculty have research programs that can be categorized into one of four general areas. These are:

1. **Biomechanics**: the application of methods from engineering and physics to understanding the design of organisms.
2. **Developmental Biology**: understanding how information coded into the genome is translated into the patterns seen in organisms. Our developmental biology program has a special emphasis on the interface between evolution and development, an area sometimes called “EvoDevo.”
3. **Neurobiology**: understanding how the nervous system regulates and controls the behavior of animals. Our neurobiology program has a special emphasis on the relationship of the nervous system to behavior (or neuroethology), and the application of quantitative methods to understanding neural function (computational neuroscience).
4. **Paleontology**: documenting and understanding evolutionary patterns and processes through analyses of the fossil record.

As part of the Darwinian Sciences Cluster, students in the program on Integrative Biology typically frame their research in an evolutionary context. Most students will, like the faculty, emphasize one of the above areas in their work and interact strongly with faculty and students with similar interests in other Departments or Committees. However, a special feature of IB training is the exploration of common themes and points of interaction between these areas, so IB students are encouraged to explore the full range of areas of inquiry that relate to their principal interests.

Life and Living in IB

All entering students are assigned desk space together in a semi-communal office. It’s a good idea to get to know other graduate students in the program and in the cluster, as they are a good source of information about both science and logistics of this Department. Your fellow students also are an excellent source of advice about the University of Chicago, living in Hyde Park, or the city of Chicago more generally. *Please review information on safety protocols during COVID-19 before using any communal space on campus or gathering with classmates and colleagues.*

Students are expected to attend the Evolutionary Morphology seminar series (Thursday evenings). This is just one means of learning about research within the department, but it has the added benefit of frequent contributions from external speakers, thereby giving IB students a flavor of the wider interests of our research community. Many other valuable seminar series from other BSD departments and committees will be available to you; these provide a superb opportunity to broaden your intellectual horizons (see the list of seminars on page 3, as a starting point).
Many seminars include an opportunity for an informal get-together – often with food – to ask questions, discuss the field, and to get to know the speaker. Get into the seminar habit; you'll find that these are a painless way to pick up a speaking acquaintance with a variety of topics, and will amply reward the time invested. If at first you feel a bit lost in the talks, be assured that’s perfectly normal – these talks are generally aimed at professionals in the field (which you soon will be). Persist and you’ll be amazed at how much you pick up over the course of a quarter.

Most of all, don’t be afraid to ask questions. If you preface your question with, “This is not my area but I was wondering....,” any question, no matter how basic, will be treated with respect. Seminar announcements are posted in the first floor hallway of Anatomy, and are available by subscribing to a variety of mailing lists (see page 3). The single most important thing you can do for yourself in graduate school is **keep in touch**. During your first year, let members of the Student Advisory Committee know how things are going; if you run into problems of any sort, let someone know.

It is important to get to know IB’s Director of Graduate Studies, Mark Westneat; the Director of Graduate Education, Audrey Aronowsky (cell: 773-701-8797); and the Graduate Education Administrator, Marcy J. Hochberg (cell:773-851-7061); as well as members of the Student Advisory Committee. They are all trained to know how the program works and are good sources for advice and advocacy. During your first few years, go out of your way to establish and maintain contact with faculty members you think you may want to serve on your Committee. Let them know what your interests are, what courses you are taking and, of course, your latest brilliant ideas. Finally, get to know the administrative staff! They are here to help you as well, and if they don’t know the answer to your question, they will help you find the answer.

**Graduate Student Training**

IB students have the privilege of studying within a Department that encompasses a large range of biological fields, with faculty who take a broad “organismal” approach to biology. Students are expected to make the most of this opportunity by familiarizing themselves with the work of the faculty and gaining a broad-based training. Although students are expected to gain a breadth of knowledge, your training should be aligned with your research interests, and will often have a direct bearing on your proposed dissertation. These aims can be achieved by a combination of course work, directed reading, laboratory work (formal rotations and other experiences), and by becoming an active member of the training program, i.e., attending seminars, and interacting with other students, postdocs, and faculty.

**Student Advisory Committee**

As an incoming student, you will meet quarterly with the Director of Graduate Education, the Graduate Education Administrator and the IB Student Advisory Committee, all of whom will assist you in making choices for a course of study each quarter, until you have completed your Preliminary Exams (see page 9 for details). The Student Advisory Committee will monitor your progress during your first two years in our program. You will meet with the Student Advisory Committee once per quarter to ensure that you are on track, and to provide you with formal feedback on your efforts and progress during this initial stage of your graduate training.
**Course requirements**

In general, most students will have completed the following coursework before arriving:

1. Biology – 6 courses or 16 semesters hours, including one course in biochemistry
2. Chemistry – two years of college chemistry (inorganic and organic) with laboratory
3. Physics – one year of college physics with laboratory

All IB students are expected to be enrolled full-time, four quarters per year. You only are required to register for coursework during Autumn, Winter, and Spring quarters; you will register for research or lab rotations during Summer quarter. *If you are lacking any of the basic course requirements listed above, you will be expected to satisfy these requirements as soon as possible.* Courses may be at the graduate or undergraduate level, as appropriate. For example, if you are taking a course on a topic you did not touch upon as an undergraduate, it may be more helpful to take an undergraduate (200) level course, rather than a graduate (300) level course. You also may register for 300-level “research” courses that carve time out of your schedule to dedicate to hands-on, practical research experiences.

Summer quarters are unstructured, generally requiring no formal classes – **but you should register for research hours.** In general, summers should be used to gain laboratory/field experience, and to gain research experience in the form of rotations, reading courses, or carrying out research related to your dissertation. Note that formal laboratory rotations can be counted as a course (and graded) if you and your lab sponsor fill out the appropriate form from the BSD’s Dean of Students office. In the Integrative Biology graduate program, a lab rotation also counts as one of the nine required graded courses. (You may contact the Director of Graduate Education or the Graduate Education Administrator to obtain a copy of this form, and/or for assistance completing it.)

**Directed Research**

For those quarters in which you do directed research with a faculty member, you should register for a 300-level research course(s) with that faculty member. (After you have passed your written prelim exam, you will register for directed research courses full-time, i.e., 3 courses / quarter). You are **not** required to take formal classes for all of your coursework during your first two years as a graduate student; indeed, if you don't spend a significant portion of your time in the latter half of your first year, and the first part of the second year, getting your feet wet in research, you'll be ignoring the most important part of your early graduate education.

**IB- & BSD-specific requirements**

IB **requires** you to take “ORGB 40000: Introduction to Integrative Organismal Biology” in Autumn quarter, and “ORGB 40001: Topics in Organismal Biology” in Winter quarter, during your first and second years in the program. The Division of Biological Sciences **requires** all BSD graduate students to take the Ethics course, “BSDG 55100: Responsible, rigorous, and reproducible conduct of research,” offered in Winter quarter. We strongly recommend that you also take “ORGB 40100: Grants, Publications and Professional Issues,” when offered in your first year, if you are eligible; this course is invaluable for those writing fellowship and grant applications during their time in the program.

**IB Distribution Requirement**

During your first two years, the Student Advisory Committee will help you decide upon the course structure that is right for you, and will approve each quarter’s course registration. You will be able to choose from a wide range of available classes, so that the demands of your research interests are met.
However, the IB emphasis on integrative science is reflected in our distribution requirement: students must complete coursework in four out of six research areas during their first two years of study:

- Biomechanics and Functional Biology
- Development
- Genetics
- Neurobiology and Behavior
- Paleontology and Morphology
- Systematics/Evolutionary History

See Appendix A on page 21 for a list of courses meeting the IB distribution requirements. (The addition of “odd” or “even” indicates the course only is taught in even [e.g., 2022] or odd [e.g., 2023] years.)

Additionally, we encourage you to consider other relevant topic options, such as molecular and cell biology. While this is not a distribution requirement, molecular and cell biology is an increasingly important component of most aspects of bioscience, and might well be considered (by future employers and colleagues) as an essential item in your research training toolkit.

Finally, beyond taking formal courses to establish your background in the biological sciences, it is important that you begin to define your research interests: attend departmental seminars when they occur, as well as Evolutionary Morphology seminars, take reading courses, speak to faculty, probe the scientific literature, and start to assemble your Dissertation Committee.

The Department expects you to do well in all your course work; avoid overloading yourself with more than you can handle (students typically take just three 100-unit courses per quarter). The Student Advisory Committee exists to provide a check on likely problems. If you get less than a “B” in any course, expect to be asked to discuss your performance with the Director of Graduate Studies or the Student Advisory Committee. Be sure to allow yourself ample time for reading and primary literature reviews. This is often best accomplished as a formal reading course with one or more of the Departmental faculty.

If you are receiving financial assistance from the Division of Biological Sciences, a training grant, or a graduate fellowship, please be aware that you must also meet all requirements of your aid program, or run the risk of losing that support. Ultimately, your graduate coursework must be sufficient to prepare you for the preliminary qualifying examination.

The Department has no foreign language requirement. However, depending on your field and research interests, you may still be asked to achieve reading competency in a particular language.

Useful links for coursework and thesis preparation

- IB / Darwin courses [http://pondside.uchicago.edu/oba/phd_program/courses.html]
- UChicago course catalog [http://collegecatalog.uchicago.edu/thecollege/biologicalsciences/]
- UC academic calendar [http://www.uchicago.edu/academics/calendar/]
- OGPA Graduation Guide [http://gradprogramsbsd.uchicago.edu/current_students/navigating_graduation.html]
- Library Dissertation Office [http://www.lib.uchicago.edu/e/phd/]
Preliminary Exams

The IB preliminary exam has two parts, a written exam ("Written prelims") taken at the end of the 4th quarter, and an oral defense of a proposal ("Oral prelims"), typically done in the 7th quarter.

Written Prelim Exam
Generally, students will take the Written Prelim Exam in September, just before the start of their second year. The exam consists of one broad, synthetic question that must be answered within one week. The precise question will be tailored to each individual student and their research interests.

The exam will provide a challenging test of the extent and breadth of your knowledge, understanding, and ability to integrate the primary scientific literature. Each essay will be limited to 10 pages of text (not including figures or references), typically in the form of a critical review of the literature. The essay will be evaluated by an Ad-Hoc Written Prelim Exam Committee of three or more faculty trainers, chosen by the Director of Graduate Studies; you will then meet with the Committee to discuss your answers in further depth and get a verdict on whether your responses were deemed adequate. To get an idea of the type of questions to expect, please see Appendix B on page 22.

Should you fail to reach the expected standard, there will be an opportunity to retake the Written Prelim Exam at a later date during Autumn quarter, up until December of your second year. If you still are unable to complete the exam satisfactorily, you will be expected to make a choice between registering for a Master’s degree (MS), or leaving the program. In order to obtain the MS, you must successfully complete a laboratory-based original research project, and present this work to the Department, both in the form of a written manuscript and presented orally as a research seminar.

The supervisory committee for the MS can be formed in one of two ways. The most straightforward and preferred method is for the student to identify at least three faculty members competent to supervise the work, and secure their agreement to act as a thesis committee. Alternately, the Student Advisory Committee will bring in a new, preliminary committee member to assist the student in working towards their Masters. To receive the MS, a student must formally request that this degree be granted.

Please note that you cannot be formally admitted to candidacy for a PhD degree until you have passed both portions of the Preliminary Examination. Once you have passed this exam, you should file for Masters candidacy even if you have every intention of going on to complete your PhD. (It’s free, take it!) When you have successfully completed the Written Preliminary Exam, and defended your dissertation proposal via the Oral Preliminary Exam (see details below), the MS is awarded on the basis of the work you have completed to this point in your research training, subject to the approval of the Student Advisory Committee. (Under these conditions, the MS costs you nothing, looks good on your resume, and, it will give your parents something to brag about while you are completing your PhD.)

Dissertation Proposal and Oral Prelim Exam
Once you have successfully passed the Written Preliminary Exam, you should concentrate on developing a dissertation proposal. To assist in this process, it is important that your final choice of a primary lab be made as early as possible in the second year, although you have until the end of your second year officially before you must declare which faculty member is to be your permanent dissertation advisor.
“Permanent” is not as eternal and unchangeable as it sounds; you may request a change of advisors at any time. However, this decision should not to be taken lightly, because your dissertation advisor should be the person to direct your research. A change in advisors usually also implies a change or major shift in research topic; because of the time necessary to complete most dissertation research, it is unwise (although not impossible) to change either one after the middle to end of your third year.

During your second year, you should concentrate on laboratory work and, where appropriate, carry out a feasibility study on your proposed dissertation project. It is expected that some preliminary data will be included in your proposal. During this phase, you will continue to take courses and be involved in directed reading projects, with your progress overseen by the Student Advisory Committee. As your dissertation interests develop, you should start to assemble a Dissertation Committee.

Your Dissertation Committee will need to include your dissertation advisor and two other faculty trainers from IB. At a minimum, two of your committee members – one of whom will serve as your Committee Chair – must have primary appointments at the University of Chicago. Additional members of your committee can be drawn from within the department, outside the department but within the University, or from outside the University. The committee minimally should have three members, but no more than six. Remember that your Committee is a resource to help you with your dissertation; you should choose Committee members with this in mind. In the unlikely event that problems arise between you and a Committee member, you may petition the OBA Department Chair at any time to change a Committee member. If you need advice on forming a Dissertation Committee, the Director of Graduate Studies (Mark Westneat) is always available for a confidential discussion.

The dissertation proposal should be formatted as a National Science Foundation (NSF) Doctoral Dissertation Improvement Grant (DDIG), or a National Institutes of Health (NIH) pre-doctoral National Research Service Award (NRSA) application. Each of these applications includes sections on Background and Preliminary Results, Specific Aims, Methodology, and Interpretation. You will not be penalized if a preliminary study has shown that a particular avenue is unlikely to be fruitful, but you will nevertheless be expected to present and explain any negative results, and the reasoning underlying any proposed changes of direction. Your proposal will provide the framework for an actual NSF or NIH grant submission.

Before the start of Summer quarter of your second year, you must submit and defend a dissertation proposal. (You will not be required to adhere strictly to this early proposal throughout the course of your PhD work – we expect your research to evolve as you progressively learn more – but deviations from your proposal should be cleared with your Dissertation Committee).

After you have written the dissertation proposal and submitted it for examination, you will present it orally to your Dissertation Committee. You may choose to present your proposal in a closed session (i.e., to the Dissertation Committee only) or in a forum open to the public (faculty and students). Nearly all students choose an open session. If you do choose a closed session, you will be required to make a public presentation of your proposal at a later date. Note that “closed” exams are closed to the general public, but remain open to IB faculty. Because the Department, not an individual faculty member, grants your degree, the entire faculty has a stake in the originality and rigor of your work.
You should email the Director of Graduate Studies and the Graduate Education Administrator at least 10 business days (generally 2 weeks) before your oral prelim exam, including: information on the members of your committee; a PDF of your proposal; and the date, time, and place of your exam. The Graduate Education Administrator will then email a notice to all faculty giving the date, time, and location of your exam. After your oral presentation of your proposal, the Dissertation Committee will administer the Oral Prelim examination, providing you with valuable feedback on the direction of your research. The results of your exam may be Pass, Conditional Pass, or Fail.

Should your Oral Preliminary Examination fall short of the standards expected by the Department, as determined by a vote of the Dissertation Committee, you will be given one more opportunity to retake this exam, by the end of September before beginning your third year. If you still are unable to satisfactorily complete the exam, you will be expected to make a choice between registering for a MS or leaving the program as outlined above.

Upon successfully completing your Oral Preliminary Examination, you will file for candidacy for the PhD. These forms should be prepared by the Director of Graduate Education, and signed by the appropriate parties before submission to the Registrar. You must have been admitted to candidacy for the PhD in order to apply for an NRSA or NSF grant, so do not neglect to complete this step!

**Divisional Professionalization Requirement**

The Division of Biological Sciences (BSD) requires all BSD students to complete two terms of professional preparation, at least one of which must involve serving as a Teaching Assistant (TA) to a UChicago course. Courses can be undergraduate, graduate, or medical, but must be in BSD, and approved to qualify for this requirement. The second term may be completed via a second TA-ship, a Diversity, Equity & Inclusion (DEI) Assistantship, or by participating in the TA training course. Students receive no additional pay for meeting this requirement.

An important component of traditional academic professionalization is to gain experience in teaching. To assist students in developing their teaching skills, you may take the TA Training Course (BSDG 50000: Teaching Assistant Training, offered in Spring quarter) that covers teaching concepts and approaches. Please be aware: you must take BSDG 50000 before you serve as a TA for an approved course, for this course to fulfill one of your two terms of professional preparation. This requirement is part of BSD’s guarantee of tuition and stipend support for five years (irrespective of your source of financial aid). For additional information on available TA- ships, contact the Director of Graduate Education or the Graduate Education Administrator. The IB training program views teaching as an important component of your professional training and believe you will find it a rewarding experience.

Please note: all TAships and DEIships require prior approval from your dissertation committee or the SAC (as appropriate), to ensure they do not undermine ongoing progress towards the PhD.

If a student requires stipend support from BSD beyond their first three years, they are required to TA additional courses. To receive Divisional funding in years four and beyond, students must TA one undergraduate course through the College per year, without additional remuneration. BSD will not provide stipend or tuition support beyond a student's sixth year; support beyond year six must come from a research grant, a non-university fellowship, or personal funds.
After you have fulfilled your Professionalization Requirement, you may qualify to receive payment for additional service, or assisting in certain courses with labs. (The Director of Graduate Education has information on current stipend levels for teaching assistants.) Please note though that you will need to concentrate increasingly on your dissertation research, so consider carefully whether you can afford to give up research time for teaching, and *be certain to obtain the support of your advisor and dissertation committee. It is not recommended that you teach during your final year in the program.* In your final year, it is most critical that you complete your research, and write and submit the dissertation in a timely fashion.

### Research Support and Grants

IB graduate students are expected to apply for research and tuition/stipend grants throughout their time in the program. Writing grants is an important part of pursuing an academic research career, and it is appropriate that students think about obtaining funds to support their research. Many small grants (e.g., Hinds Fund, Sigma Xi, etc.) are available, as well as competitive federal funding opportunities.

See the “Student Resources” section on the departmental website; students also are encouraged to explore the [Fellowships Database](https://grad.uchicago.edu/fellowships/) on UChicagoGRAD’s website, and/or schedule an appointment with a [fellowship advisor](https://grad.uchicago.edu/fellowships/fellowship-advising/), to help identify specific funds that are available for your research interests.

Don't neglect smaller grants; these can be an important source of funding, and you will find that most of the real work goes into writing the first application. (Text can largely be recycled for subsequent applications.) There is a subsidiary benefit to securing outside funding, which you should not minimize – having a number of grants on your *curriculum vitae* will make you more attractive to potential employers. Finally, applying for small grants will help you to develop good grant-writing skills that will always be important to your career success. Please be aware that any time you are preparing a fellowship or grant application, you must check in with the IB grants and contracts administrator, to see whether you need to route your application through the University. *Failure to do so before submission could result in many headaches after an award has been made!*

### National Science Foundation GRFP

If you are eligible, the program expects that you will write and submit a National Science Foundation GRFP (3-year fellowship) application at the beginning of Autumn quarter of your first or second year. Because NSF only allows students to submit one proposal as a graduate student, please discuss with the Student Advisory Committee which year is most appropriate for you to submit your application. ORGB 40101: Grants, Publications, and Professional Issues (Grants & Pubs) will help you with this application. These are highly desirable awards to receive, both for you and for the University. This is also an excellent starting point for developing a strong CV that demonstrates your ability to compete for funding, as well as your promise and achievement in carrying out independent scientific research.
Obviously, your ability to bring in external funding support for three years of your graduate education helps BSD, and the IB training program, support a larger number of talented graduate students. Success in gaining funding from NSF depends on:

1. A strong paper record (i.e., strong GPA, GREs, an undergraduate honors research thesis paper).
2. A strong research statement; you need to be able to define the general direction of your research interests and why the program that you are in will help you to achieve these goals.
3. Strong detailed letters of recommendation from both former and current professors who are familiar with you, your research interests, and the specific proposal you will be submitting.

A detailed research project is not required; however, the more focused you can be in describing your research goals, the stronger your proposal will be. You should consult with the Director of Graduate Studies, and also take Grants & Pubs (ORGB 40101) when offered during your first year. These are competitive grants, so do not be disappointed if you fail to receive an award. Even if you do not receive a pre-doctoral fellowship, the experience is certainly worth the effort of having written your first research application.

**National Institutes of Health NRSA**

If you are working in an area relevant to research programs of the National Institutes of Health (NIH), we will expect you to apply for an NRSA. NRSA fellowships pay a stipend that the BSD supplements to the Divisional level, together with support for insurance and travel. Tuition costs are supplemented by BSD for students holding these fellowships. These pre-doctoral awards are for up to 5 years. (Note that there are also 3-year NRSA post-doctoral fellowships; you will not be precluded from holding one of these should you obtain a pre-doctoral NRSA). Pre-doctoral awards provide no support for research expenses.

**Research Conferences**

It is important for your academic training, and also for raising your profile within your field, that you attend research conferences. The IB training program provides up to $500 travel support for students to attend a conference each year (see Student Expense Account section, below). Ideally, this will be to present a portion of your research results. Presenting your research is critical at the early stages in your career for establishing your identity in your field; it will give people something to talk about and remember you by.

IB support for travel is intended to help cover the meeting registration fee, your travel costs (airfare, car, bus/cab) and housing (hotel room/AirBnb). No meal expenses or alcohol are reimbursable. To receive reimbursement for these costs, it is essential that you retain original receipts. Submit these receipts along with a travel report form, within 30 days, to the Graduate Education Administrator (who also can provide you with a copy of the form). Please note that travel support is budgeted from July 1–June 30 of each academic year.

If you are supported by or are working on a faculty grant, these funds will take precedence over the training program’s support for your travel. Your Student Expense Account can also help to pay expenses related to off-campus training or field courses.
**Student Expense Account / Travel Support**

IB students are eligible for $500 each year, *for a total of five years*. This $500 expense account is intended for travel support, to enable students to present at a national conference/meeting each year. Requests to use funds for a non-conference-related expense will require prior approval from both the OBA Department Chair (Robert Ho), and the Director of Graduate Studies (Mark Westneat).

If you do not use the entire $500 in a given year, your balance may be rolled over, but only for a two-year period, with a maximum balance of $1,000. If there is some special circumstance that will require a larger sum than is available in a single year – e.g., a major conference/meeting held outside the U.S.; a course important to your training, presented at a field station or other remote location – it is possible to accumulate your travel award over more than one year. Again, you need to contact the OBA Chair and the Director of Graduate Studies to get their approval *in advance*.

Please note that all expenditures must be supported by itemized receipts, so save all credit card receipts (with purchase details), hotel bills, etc. Expenses not documented with receipts cannot be reimbursed. You also will be required to submit a signed waiver acknowledging that the expense is legitimately non-taxable. If you have any questions about the purpose/policy for Student Expense Account funds, please contact Mark Westneat or Audrey Aronowsky for clarification.
The Doctoral Dissertation

Dissertation Committee Meetings
The IB training program and BSD requires that all students admitted to candidacy, i.e., who have passed the written preliminary exam and the oral qualifying exam, meet with their Dissertation Committee **no less than two times each year** during the remainder of their time as a PhD candidate.

Please be aware that **it is your responsibility to schedule these meetings**. They are extremely important, so don't avoid arranging them. We encourage you to schedule these as soon as possible, even if your meeting will be later in the quarter, to minimize scheduling conflicts. Committee meetings ensure a mechanism for maintaining communication between you and your Committee members, as well as your advisor, with whom you will most likely maintain closest contact. The degree of contact that you have with your advisor will depend on the nature and field of research that you have chosen to embark on.

For Committee meetings and resultant progress reports, the Dissertation Committee has a formal Committee Chair, separate from your advisor. The Dissertation Committee Chair runs the Committee meetings, takes notes on the conversations, and prepares a report of each Dissertation Committee meeting, which is circulated to you, your advisor, and to your official files.

The goal of these meetings is for you to present a progress report on your work, identifying any difficulties that may have come up since the last Dissertation Committee meeting, and any resulting changes in the scope or direction of your dissertation. You are required to provide your Committee with a progress report and timeline **one week prior to the Committee meeting**. The Committee meeting summary worksheet is available online, or from either the Director of Graduate Education or the Graduate Education Administrator.

It is wise strategy to get your Committee to approve any modifications to your planned dissertation as they become apparent – these are not issues you want to first arise in your dissertation defense. In addition, it is a good idea to plan to present representative data that you have collected, and a summary of the data, which your Committee members can evaluate and comment on. Feedback from your Committee members, who have varying perspectives and expertise bearing on your doctoral project, is a critical component of these meetings.

Following each meeting, coordinate with your Committee Chair on a written summary of the meeting, documenting your Committee’s evaluation of your progress and the goals that were agreed on at the meeting for your subsequent work. This report will be circulated to you and to all members of your Committee, as well as being kept in your student file. In this way there is a paper record giving you, and the IB training program, feedback on the nature of your progress. Remember that this report, and the meetings themselves, are meant to serve a positive role in providing you with critical feedback on the progress of your work.

In our experience, inadequate communication between you and your Dissertation Committee is the main source of difficulty likely to arise when you write and defend your dissertation. By keeping your Committee informed regarding your progress and any change in the content and scope of your thesis, you will assure that no unforeseen surprises await you at your defense.
If, during the course of your work, you have a problem, it is your responsibility to seek advice from the appropriate member of your Committee, much as you will ask advice of your colleagues after you receive your degree. It is possible that you may have a problem but not recognize it. This represents an additional reason for regularly reporting to your Dissertation Committee – they can help you by offering advice and pointing out both problems and possible solutions.

**Setting dissertation deadlines and goals**
As you work on your dissertation research, set clear goals and deadlines for yourself. If your project turns out to be unworkable, how many years are you willing to devote to finding this out? With the assistance of your advisor and Dissertation Committee, set yourself a deadline for obtaining definitive, positive results, using your best judgment as to how long this will take, yet leaving yourself enough time to change the direction of your research if your original proposal turns out to be unworkable. Budget ample time for writing your dissertation – only you can judge how long this may take you – keeping in mind that your dissertation will probably go through at least two drafts before the final version.

As you approach the quarter in which you intend to graduate, please meet with the Director of Graduate Education at least four weeks prior to the start of that quarter, to review what needs be done in order for you to graduate (applying for graduation, registration, the submittal process and deadlines for the University Dissertation Office, etc.).

**Recommended dissertation format**
The format of your dissertation is up to you and your Dissertation Committee, as long as it also meets the basic formatting requirements of the University. Make sure to meet with the University of Chicago Dissertation Office (http://www.lib.uchicago.edu/e/phd/) *early* in the dissertation writing process to check on the latest regulations.

Although the training program in Integrative Biology has no specific requirements concerning the dissertation itself, we recommend you structure your dissertation as separate chapters that correspond to publishable papers. Each chapter will have an introduction, materials and methods, results, and discussion sections (as opposed to a “traditional” dissertation, which comprises a single introduction, materials and methods, results, and discussion sections). While this will add some redundancy to your dissertation, due to the overlap among your principal chapters, writing your dissertation such that each chapter represents the format of a scientific paper facilitates any final changes that may be required, before you actually submit your paper(s) for publication to a journal.

This latter approach will generally require that you write a short introductory chapter as a background leading into your primary research chapters, and a short summary chapter providing an overview of your entire dissertation research. Publication of your work in refereed journals should be your real goal, not simply completing your dissertation. If you submit dissertation chapters for publication *before* you defend your dissertation – a practice that we strongly encourage – be sure to give the members of your Dissertation Committee a chance to review and comment on the manuscript *before* you submit it.

Nothing irritates a Dissertation Committee more than to be presented with a *fait accompli* in the form of a published dissertation chapter that they didn’t get an opportunity to review.
Scheduling your Dissertation Proposal Hearing

Once you have completed each chapter of your dissertation, circulate it among your Committee members for their comments. Your Committee must judge the draft of your dissertation to be acceptable in format and style, before you can schedule your dissertation defense. A final copy of your dissertation must be submitted to your Committee, and made available for examination by IB faculty and trainers, two weeks before your defense. You should also have an abstract of your dissertation (about two typed pages) to give to the Director of Graduate Education, for circulation to all members of the faculty two weeks before your defense.

Consult with your dissertation advisor and your Committee in setting a date for the dissertation defense. Send an e-mail to the Director of Graduate Education, at least 10 business days before the defense, which includes: a list of your Committee members, the title of your dissertation, and the date, time, and place of your scheduled Dissertation Hearing. The two-page abstract of your dissertation should be included. An email will be sent to all students and faculty announcing your Dissertation presentation.

N.B.: In order to graduate in a given quarter, you must have successfully defended your dissertation by the end of the fifth week of that quarter (see University timelines below). You must file an online application for the PhD Degree by the beginning of the quarter in which you plan to graduate. Please meet with the Director of Graduate Education four weeks before the start of the quarter in which you plan to graduate, to review the graduation process.

To graduate with your PhD in Autumn 2021** Winter 2022** Spring 2022 Summer 2022**
as a registered student (stipend + tuition)

<table>
<thead>
<tr>
<th>Event</th>
<th>Autumn 2021</th>
<th>Winter 2022</th>
<th>Spring 2022</th>
<th>Summer 2022**</th>
</tr>
</thead>
<tbody>
<tr>
<td>register to graduate by 1st Friday of Q</td>
<td>10/1/21</td>
<td>1/7/22</td>
<td>3/25/22</td>
<td>6/17/22</td>
</tr>
<tr>
<td>final dissertation deadline 7th Friday of Q (*except Summer)</td>
<td>11/12/21</td>
<td>2/18/22</td>
<td>5/6/22</td>
<td>7/22/22*</td>
</tr>
</tbody>
</table>

*The final dissertation deadline for students graduating in Summer is the 6th Friday of Q
**Summer, Autumn, and Winter degrees will be mailed. Graduates can return for Spring Convocation if they choose.

To graduate with your PhD in Autumn 2021 Winter 2022 Spring 2022
without registration (no stipend or tuition)

<table>
<thead>
<tr>
<th>Event</th>
<th>Autumn 2021</th>
<th>Winter 2022</th>
<th>Spring 2022</th>
</tr>
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<tbody>
<tr>
<td>register to graduate by 1st Friday of Q</td>
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<td>3/25/22</td>
</tr>
<tr>
<td>final dissertation deadline</td>
<td>9/10/22</td>
<td>12/10/21</td>
<td>3/18/22</td>
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</tbody>
</table>
Timeline for IB Graduate Work  
A summary of the principal steps in obtaining your PhD

First Year
- Orientation week – meet with Director of Graduate Education, Graduate Education Administrator, and Student Advisory Committee, in preparation for Autumn quarter
- Begin fulfilling breadth requirements
- Apply for pre-doctoral fellowships
- November – second meeting with SAC, in preparation for Winter quarter
- Take BSD ethics course in Winter quarter
- February – third meeting with SAC, in preparation for Spring quarter
- Schedule and participate in lab rotations, as appropriate
- End of summer quarter – prepare and submit the Written Preliminary Exam

Second Year
- Orientation week – fourth meeting with SAC, in preparation for Autumn quarter
- Choose primary lab and dissertation advisor
- Start to assemble Dissertation Committee (minimum 3 IB trainers); plan an informal meeting of likely members
- December – fifth meeting with SAC, in preparation for Winter quarter
- March – sixth meeting with SAC, in preparation for Spring quarter
- June – Oral Preliminary Exam; file for candidacy for the MS and the PhD

Third Year and Beyond
- Schedule regular meetings with Dissertation Committee, at least twice each year (preferably Autumn and Spring)
- Apply for grants; schedule a Fellowship Advising appointment with UChicagoGRAD staff
- Present your research at appropriate conferences and symposia
- Ensure you have completed your teaching requirement by this point
- Plan to have one paper submitted for publication by the end of your 3rd year
- Begin thinking about next steps after graduation (see p. 19)

Final Year
- Continue meeting with your advisor and Dissertation Committee
- Meet with the Director of Graduate Education at least 4 weeks prior to the start of the quarter in which you will graduate, to review all steps you need to take to graduate, e.g., applying for graduation, final registration, the dissertation submission process, etc.)
- Two weeks before the Dissertation Defense: distribute a 2-page summary to the Department, and final copies of Dissertation to Committee and available to IB faculty and trainers
- Complete the oral defense of your dissertation by the end of the 4th week of the quarter
- File the approved dissertation with the Dissertation Office by Friday of the 7th week (or 6th week in summer quarter). **If you miss this deadline you cannot graduate in that quarter.**
- Please monitor the “Navigating Graduation” section of OGPA’s website for the most accurate and up-to-date instructions and timelines for your final year: [http://gradprograms.bsd.uchicago.edu/current_students/navigating_graduation.html](http://gradprograms.bsd.uchicago.edu/current_students/navigating_graduation.html)
Biological Sciences Division Policy Requirements
derived admission to candidacy to the PhD, and for the PhD degree

1. Admission to candidacy for the degree of PhD requires:
   a. Completion of Divisional Course requirements (five courses, one of which may be
      fulfilled by a graded laboratory rotation and/or a directed reading). A “B” average (GPA
      = 3.0) must be maintained.
   b. Submission of a written thesis proposal, and its defense to the satisfaction of the
      candidate’s thesis committee (note in some programs this defense also has a public
      component).

2. Admission to candidacy must occur, or be scheduled to occur, before the end of the student’s ninth
   quarter in residency (typically the Fall quarter of the 3rd year).

3. If admission to candidacy has not occurred by the end of the student’s ninth quarter, then they
   will be unable to register at the beginning of the tenth quarter unless OGPA has approved a
   detailed plan from the program, student, and thesis advisor, in which:
   a. The program adequately explains why candidacy has not yet been achieved
   b. The student lays out a detailed plan for completion of the thesis proposal, with a timeline
      that does not extend beyond the end of their eleventh quarter in residency
   c. The thesis advisor provides a detailed plan, which includes frequency and nature of
      mentoring meetings, to assist the student in satisfactorily completing and defending the
      thesis proposal

4. Completion of the PhD degree additionally requires:
   a. Completion of Divisional professionalization requirements
   b. Completion of Divisional Ethics training requirements
   c. Completion of all graduate program-specific requirements
   d. Submission and oral defense, to the satisfaction of the student’s thesis committee and
      graduate program, of an original dissertation
Next Steps After Graduation

There are many career paths that you may choose to pursue after your PhD. UChicagoGRAD offers career advising for graduate students (http://grad.uchicago.edu/training_support/). They also have a dedicated representative for BSD students who is available to help with both academic and non-academic job preparation and professional development.

Many doctoral graduates will decide to pursue an academic career, either via further postdoctoral research training, or by directly entering an academic research or teaching position. Others will take up research positions in industry, and still others will make use of the unique intellectual training afforded by a PhD to pursue science-related or non-scientific careers. The myChoice program (http://www.mychoice.uchicago.edu/) is designed to expose BSD students to a broad range of potential careers prior to graduation.

Postdoctoral Fellowships
Postdoctoral fellowships can offer you the opportunity of learning new techniques and points of view, and also give you the chance to improve your academic credentials by publishing a greater body of work. In most fields within the biological sciences, post-doctoral training is required in order to be competitive for a job at a research university. Certainly you are more likely to get a better academic position after having completed a postdoc.

You will have a broader choice of labs in which to do your postdoc if you are able to obtain your own fellowship funding, rather than relying on your potential supervisor to provide funds. Also, having such a fellowship will show future employers that you have the capacity to obtain independent funds. You will need to identify a supervisor and discuss potential projects before you can make most applications. There are several different types of postdoctoral fellowships available, depending on your field; consult with UChicagoGRAD, the OGPA office, and the Director of Graduate Education, about such funding opportunities.

Because of the significant time delay between making fellowship applications and the start of the funding, not to mention the possibility that you may be unsuccessful at your first attempt, it is a good idea to begin thinking about labs for your postdoc up to 18 months before you hope to start.

The BSD Postdoctoral Association also is a great resource (http://www.bsdpostdoc.uchicago.edu/) – they offer helpful seminars during the academic year, and opportunities to speak with lots of people who have just recently experienced what you are going through!

Jobs in Academe
The current job market is fairly tight, and demographics seem to indicate that the market will not get better soon; therefore, you have to convince prospective employers at the outset that you are a professional, competent scientist, even if you are applying for jobs before you actually receive your degree. Since most advertised academic positions attract anywhere from 100-300 applications, you need to find some way to make your application stand out. There are basically two ways to increase your visibility, and you should decide early in your graduate career that you are going to use both.
1. **Publications.** Publishing your research is the best way to get yourself known in science, and will show prospective employers that you do publish your research. The latter point may seem silly, but it isn't; approximately three-fourths of all dissertations completed in the U.S. are never published in professional journals.

Since active research and publishing are requirements for most jobs, having a few publications on your CV will greatly improve your chances of landing the postdoc or job you want. Decide early that you are going to have at least one paper published or in press before you leave grad school. (Keep in mind that it will take at least 3-6 months for a submitted manuscript to go through the reviewing process; if a paper is accepted it will take at least another 4 months to 1 year before it actually appears in print.)

2. **Making contacts and establishing an identity in your field.** This process uses word-of-mouth recommendations, news of your work, and personal acquaintances, and can often be the deciding factor in getting the postdoc or job you want. So how do you get plugged into this process if you are a mere graduate student? There really is only one way – advertise yourself.

Whenever there is a Departmental or Training Program seminar in your field, hang around after the seminar is over and take the opportunity to talk with the speaker; contribute what you can to the conversation. Go to one national meeting or conference each year (if you can), introduce yourself to people, and talk informally about your research and interests. Once you have data to present, discuss with your thesis advisor the possibility of giving a paper at one of these meetings. If you do this, by the time you are writing your dissertation, you'll find that you know many of the people in your field and they know you.
## Appendix: Courses meeting IB’s Breadth Requirements, 2021-2022

<table>
<thead>
<tr>
<th>Biomechanics &amp; Functional Biology</th>
<th>Development</th>
<th>Genetics</th>
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</thead>
<tbody>
<tr>
<td>ORGB 30250: Chordates (EVEN)</td>
<td>BIOS 20189: Fundamentals of Dev Bio</td>
<td>BCMB 31400: GAMO</td>
</tr>
<tr>
<td>ORGB 32233: Comparative Vertebrate Anatomy (ODD)</td>
<td>DVBI 36200: Stem Cells &amp; Regeneration</td>
<td>BIOS 21306: Human Genetics &amp; Evolution</td>
</tr>
<tr>
<td>ORGB 32245: Biomechanics (ODD)</td>
<td>DVBI 36400: Developmental Mechanisms</td>
<td>ECEV 35600: Population Genetics</td>
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<td>ORGB 33600: Vertebrate Development</td>
<td>HGEN 41700: Intro to Statistical Genetics</td>
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<td></td>
<td>ORGB 33850: Evolution &amp; Development</td>
<td>HGEN 48600: Computational Biology</td>
</tr>
<tr>
<td></td>
<td>ORGB 39500: Historical Foundations of Evo Devo</td>
<td>STAT 35420: Stochastic Processes in Gene Regulation</td>
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</table>

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<thead>
<tr>
<th>Neurobiology &amp; Behavior</th>
<th>Paleontology &amp; Morphology</th>
<th>Systematics &amp; Evolutionary History</th>
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<tbody>
<tr>
<td>BIOS 23249: Animal Behavior</td>
<td>BIOS 23247: Bioarcheology</td>
<td>ECEV 34500: Advanced Topics in Evolutionary Biology</td>
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<tr>
<td>BIOS 24110: Fundamentals of Neuro</td>
<td>EVOL 31900: Topics in Paleo</td>
<td>EVOL 31700: Macroevolution</td>
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<td>BIOS 24133: Neuroscience of Seeing</td>
<td>EVOL 32400: Invertebrate Paleo &amp; Evolution</td>
<td>EVOL 31900: Topics in Paleo</td>
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<td>BIOS 24231: Methods in Comp Neuro</td>
<td>EVOL 36700: Morphometrics (EVEN)</td>
<td>EVOL 32400: Invertebrate Paleo &amp; Evolution</td>
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<td>BIOS 24408: Modeling &amp; Signal Analysis</td>
<td>EVOL 46200: Evolution and the Fossil Record</td>
<td>EVOL 35300: Phylogenetic Comparative Methods</td>
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<td>NURB 30107: Behavioral Neuro</td>
<td>GEOS 36905: Conservation Paleobiology</td>
<td>EVOL 35401: Tree of Life (ODD)</td>
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<td>ORGB 30250: Chordates (EVEN)</td>
<td>EVOL 46200: Evolution and the Fossil Record</td>
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<td>ORGB 34650: Comp Approaches to Cog Neuro</td>
<td>ORGB 31201: Mammal Evolution (EVEN)</td>
<td>GEOS 36100: Phylogenetics &amp; Fossil Record (EVEN)</td>
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<td>ORGB 42600: Theoretical Neuroscience</td>
<td>ORGB 31300: Key Issues in Vert Evolution</td>
<td>ORGB 31201: Mammal Evolution (EVEN)</td>
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<tr>
<td></td>
<td>ORGB 32233: Comparative Vertebrate Anatomy (ODD)</td>
<td>ORGB 31300: Key Issues in Vert Evolution</td>
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<td></td>
<td>ORGB 33265: Human Origins</td>
<td>ORGB 36400: Molecular Phylogenetics (EVEN)</td>
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