

# Endocrinology

The main goal of our program is to engage students in the interdisciplinary aspects of the field of endocrinology through seminars, courses, and our diverse faculty research perspectives that range from structural, molecular, and cellular endocrinology through organismal and comparative endocrinology to chemical ecology. Graduates from our endocrinology program have transitioned into careers in a variety of fields including education, research in both academic and industry settings, government regulation, and private business.

The faculty associated with the Graduate Group in Endocrinology leading to the MA and the PhD degrees have diverse interests representing endocrinology in the broadest sense: chemical mediators in the living world directed by autocrine, paracrine, endocrine, and ectohormonal factors. Our program faculty encompasses hormone-oriented research programs such as cancer biology, signal transduction, drug design, membrane biology, virology, metabolism, differentiation, morphogenesis, toxicology, and gene transcription. Graduates from our endocrinology program have transitioned into careers in a variety of fields including education, research in both academic and industry settings, government regulation, and private business.

Students who plan to work for higher degrees in endocrinology at Berkeley will be guided by a graduate adviser and by the professor who directs their research (mentor). The graduate adviser and mentor will ascertain whether students have met the minimum requirements, will recommend to prospective candidates what additional courses to take, will decide with them the fields to be covered in the qualifying examinations, and will act generally in an advisory capacity. The candidates are expected to have completed an undergraduate major in some area of animal biology leading to the BA or BS degree.

To advance to candidacy for the PhD, students must complete all requirements, including passage of an oral qualifying examination.

## Admission to the University

### Minimum Requirements for Admission

The following minimum requirements apply to all graduate programs and will be verified by the Graduate Division:

1. A bachelor's degree or recognized equivalent from an accredited institution;
2. A grade point average of B or better (3.0);
3. If the applicant comes from a country or political entity (e.g., Quebec) where English is not the official language, adequate proficiency in English to do graduate work, as evidenced by a TOEFL score of at least 90 on the iBT test, 570 on the paper-and-pencil test, or an IELTS Band score of at least 7 (note that individual programs may set higher levels for any of these); and
4. Sufficient undergraduate training to do graduate work in the given field.

### Applicants Who Already Hold a Graduate Degree

The Graduate Council views academic degrees not as vocational training certificates, but as evidence of broad training in research methods, independent study, and articulation of learning. Therefore, applicants who already have academic graduate degrees should be able to pursue new

subject matter at an advanced level without need to enroll in a related or similar graduate program.

Programs may consider students for an additional academic master's or professional master's degree only if the additional degree is in a distinctly different field.

Applicants admitted to a doctoral program that requires a master's degree to be earned at Berkeley as a prerequisite (even though the applicant already has a master's degree from another institution in the same or a closely allied field of study) will be permitted to undertake the second master's degree, despite the overlap in field.

The Graduate Division will admit students for a second doctoral degree only if they meet the following guidelines:

1. Applicants with doctoral degrees may be admitted for an additional doctoral degree only if that degree program is in a general area of knowledge distinctly different from the field in which they earned their original degree. For example, a physics PhD could be admitted to a doctoral degree program in music or history; however, a student with a doctoral degree in mathematics would not be permitted to add a PhD in statistics.
2. Applicants who hold the PhD degree may be admitted to a professional doctorate or professional master's degree program if there is no duplication of training involved.

Applicants may apply only to one single degree program or one concurrent degree program per admission cycle.

## Required Documents for Applications

1. **Transcripts:** Applicants may upload *unofficial* transcripts with your application for the departmental initial review. *If the applicant is admitted*, then *official* transcripts of all college-level work will be required. Official transcripts must be in sealed envelopes as issued by the school(s) attended. If you have attended Berkeley, upload your unofficial transcript with your application for the departmental initial review. *If you are admitted*, an official transcript with evidence of degree conferral *will not* be required.
2. **Letters of recommendation:** Applicants may request online letters of recommendation through the online application system. Hard copies of recommendation letters must be sent directly to the program, not the Graduate Division.
3. **Evidence of English language proficiency:** All applicants from countries or political entities in which the official language is not English are required to submit official evidence of English language proficiency. This applies to applicants from Bangladesh, Burma, Nepal, India, Pakistan, Latin America, the Middle East, the People's Republic of China, Taiwan, Japan, Korea, Southeast Asia, most European countries, and Quebec (Canada). However, applicants who, at the time of application, have already completed at least one year of full-time academic course work with grades of B or better at a US university may submit an official transcript from the US university to fulfill this requirement. The following courses will not fulfill this requirement:
  - courses in English as a Second Language,
  - courses conducted in a language other than English,
  - courses that will be completed after the application is submitted, and
  - courses of a non-academic nature.

If applicants have previously been denied admission to Berkeley on the basis of their English language proficiency, they must submit new test scores that meet the current minimum from one of the standardized tests.

## Where to Apply

Visit the Berkeley Graduate Division application page (<http://grad.berkeley.edu/admissions/apply>) .

## Admission to the Program

The online Graduate Application for Admission, Fellowship and Financial Aid will be available in early September on the Graduate Division's website ([http://www.grad.berkeley.edu/admissions/grad\\_app.shtml](http://www.grad.berkeley.edu/admissions/grad_app.shtml)) and will include the current deadline to apply to the program. Be sure to allow sufficient time for your letters of recommendation and test scores to arrive by the deadline.

## Checklist of Required Documentation and Information

- 1. Completion of the on-line Graduate Application for Admission, Fellowship and Financial Aid.** Read the instructions carefully and complete all pages relevant to you. Be sure to include:
  - A current email address: this is the primary means of communication.
  - List faculty members you have contacted or whose research you are interested in. We strongly recommend that you initiate correspondence with faculty members whose research is of interest to you. Please refer to the endocrinology faculty list for descriptions of faculty research interests.
  - Grade Point Average (GPA) after the first two years (international applicants do not need to calculate GPA).
  - Statement of purpose and personal history statement. Take particular care in writing your statement of purpose. It is used to evaluate your preparation and aptitude for graduate study in our department.
- 2. Three letters of recommendation.** At least two letters must be from faculty familiar with your academic performance. Your recommenders will be able to submit on-line letters of recommendations. See the Graduate Division (<http://www.grad.berkeley.edu/prospective/index.shtml>) website for detailed instructions and information. We will also accept letters directly from a letter service.
- 3. Transcripts from each college and graduate institution you have attended.** You can upload unofficial transcripts for review purposes. Official transcripts will be required if admitted.
- 4. GRE scores,** or another appropriate exam (i.e., MCAT). The subject GRE test is not required. Institution code: 4833; Department Code: 0299.
- 5. Test of English as a Foreign Language (TOEFL)** for applicants from a country in which the official language is not English. Tests taken before June 2012 will not be accepted even if your score was reported to Berkeley.

For questions for inquiries contact the graduate student affairs officer.

## Normative Time Requirements

Total normative time is 5 years.

## Curriculum

The following minimum requirements give the background prerequisite to candidates for the PhD degree in the field of endocrinology.

- Completion of the requirements listed above for the MA candidates.
- Further course work selected in consultation with the major professor and graduate adviser to allow emphasis in the area(s) of the student's research interest, such as biochemistry, cell biology, immunology, molecular biology, morphology, physiology, psychobiology, or tumor biology.
- Two additional graduate level seminars, including advanced topics in endocrinology and one other seminar in endocrinology.
- The seminar will be selected after consultation with the research adviser.
- It is recommended that students enroll in the teaching colloquium INTEGBI 375.
- Serve as a graduate student instructor in one or more appropriate courses. Enforcement of this requirement will depend on the availability of funding.
- Dissertation.
- Students are encouraged to give oral presentations on their research at least twice during their tenure at Berkeley in INTEGBI 248 or in other appropriate courses.

In addition, the student must pass an oral qualifying examination for PhD degree candidacy. This exam should be taken by the end of the fourth semester in residence. For the exam, students will be held responsible for subjects the graduate adviser and mentor designate from the list of approved topics.

The purpose of the oral exam is to test the student's understanding of general principles in broad areas, rather than detailed knowledge of narrow fields. However, the examining committee may choose to evaluate the student's abilities to understand and solve problems or questions related to their chosen area of research. This decision will depend to some degree on the student's training and experience. When the oral exam does cover a research topic, not more than 45 minutes of the three hour exam period should be devoted to that area.

All students are required to defend the following two areas on the oral exam:

- Organismal endocrinology (either mammalian or comparative).
- Molecular and cellular endocrinology.

Two of the following list of 12 subject areas of plant and or animal biology must also be defended:

1. Anatomy
2. Biochemistry
3. Cell Biology
4. Developmental Biology
5. Ethology
6. Evolutionary Biology
7. Genetics
8. Immunology
9. Molecular Biology
10. Neurobiology
11. Physiology

## 12. Tumor Biology

Some other topics may also be acceptable, but approval by a majority of the guidance committee is required in such cases.

Narrow fields, such as pituitary anatomy and physiology, osmoregulation, membrane biology or regulation of gene expression are not acceptable.

Although there is no specific foreign language required of candidates, students are encouraged to be familiar and conversant with the foreign language literature in the field or fields relevant to their research interest. The mentor may require the student to take an appropriate reading examination in the foreign literature, or to examine the student in this literature as part of the PhD oral examination.

## Curriculum

### Master's Degree

In addition to the general requirements set forth in the Announcement of the Graduate Division for the master's degree under Plan 1, the following minimum requirements should be met before the student begins the master's program in endocrinology:

- Chemistry, to include introductory inorganic, quantitative analysis, introductory organic, and introductory biochemistry.
- General physics and math through calculus.
- General biology.
- A survey course in organismal physiology.
- A survey course in cellular and molecular biology.

Students who are deficient in any of these courses will be required to take them before completion of the MA program.

The following courses are required of all MA candidates:

- Courses in molecular and organismal endocrinology.
- One seminar course requiring student presentations (e.g., INTEGBI 248).
- Enroll in INTEGBI 248 during each semester offered.

A course in statistics is recommended.