Background

Molecular & Integrative Physiology is one of five graduate fields associated with the Biological & Biomedical Sciences (BBS) Graduate Program. As an umbrella program, the BBS fosters an atmosphere of collaboration, focusing on the interface between scientific research and clinical practice as well as a commitment to animal and human health. The Graduate Fields associated with the BBS Program share a set of values and expectations in the training of PhD students. Our goal is to maximize the effectiveness of the Fields while maintaining their unique identities and structures. The following graduate fields are members of the BBS Graduate Program:

- Comparative Biomedical Sciences
- Immunology & Infectious Disease
- Molecular & Integrative Physiology
- Pharmacology
- Zoology & Wildlife Conservation

Learning Outcomes

The overriding goal of the PhD program is to assemble the knowledge and skills in a discipline that enables you to perform research that will create new knowledge. While each student's course of study is tailored to his or her needs and background, students across the program will share many learning goals on the road to establishing themselves as a professional scientist, including: independent learning and mastery of the appropriate literature in the student's subfield; integration of the current state of knowledge to formulate a cutting edge research question; acquisition of data collection skills; acquisition of appropriate analysis skills to derive conclusions for appropriately designed investigations; development of teaching skills; effective communication abilities using written, spoken and presentation skills.

Additionally, it is essential that biomedical and biological scientists are aware of ethical issues pertaining to the conduct and dissemination of research, in collaborative research endeavors as well as instances that may arise concerned with the teaching arena. Opportunities to participate in training concerned with ethical issues will be provided and must be completed by all students.

Proficiencies

A candidate for a PhD degree in the BBS Graduate Program is expected to demonstrate mastery of knowledge in the field, and to contribute significant, original research to our understanding of biology within their sub-discipline. In so doing, the candidate will have demonstrated the following upon completion of the program:

1. Made an original and substantial contribution to the field.
2. Demonstrated in-depth knowledge of one area of expertise.
3. Demonstrated a broad knowledge of theory and research across several sub-disciplines in the field.
4. Learned and followed ethical guidelines for working in the field.
5. Written and spoken effectively to professional and lay audiences about issues in the field.

Assessment of Learning Outcomes

There are four main ways that learning is assessed as part of a PhD program in the BBS Program.

A) The first is through formal coursework and registration unit grading. Assessments include exams, essays, participation and presentations (for coursework) and a semiannual assignment of registration units documenting satisfactory progress toward the degree. Per the Cornell Graduate School, one

registration unit corresponds to the satisfactory completion of one academic semester of full-time study and research. The fraction of a registration unit granted for a semester of full-time study thus represents an evaluation of the student's academic progress by the Special Committee Chair.

Students are advised throughout their graduate education program. Prior to selecting a laboratory for thesis work, the Director of Graduate Studies serves as the advisor. Once a research mentor is identified, he or she becomes the Chair of the student's Special Committee along with additional faculty members with expertise in the discipline. The Special Committee is responsible for helping students develop their individualized research and academic programs. They ensure that students make appropriate progress toward completion of the PhD.

B) The second is through the Annual Progress Report, a requirement of the Field. Students are required to meet with their Special Committee yearly to review progress and discuss future academic plans. The committee prepares a report following the meeting that summarizes progress and provides feedback and direction. Students are also asked to submit a yearly curriculum vitae (CV), which provides a summary of educational and academic backgrounds teaching and research experience, publications, presentations, awards, honors, affiliations and other details.

C) The third is through the admission to candidacy exam (i.e. the "A" exam). The A-exam typically is conducted by the fifth semester of graduate study and examines the student's general breadth and depth of knowledge in the field and potential for independent research in their area of study. The A-exam format is an oral exam that includes a formal presentation by the student. Typically the student is asked to prepare and submit a written research proposal to the committee prior to the exam. The written proposal is the basis for the oral presentation.

D) The fourth and final assessment occurs at the close of the program in the form of defending the dissertation (i.e. the "B" exam). Following acceptance of the completed dissertation by the Special Committee, the student presents his or her thesis work in a public seminar, followed by an oral examination by the Special Committee. The B exam enables the faculty (and fellow students) to assess the quality of a student's research and highlights written, oral and communication skills.