

## Unit Plan for Assessing and Improving Student Learning in Degree Programs

Unit: Pathobiology

Unit Head approval: Daniel L. Rock

Date: April 30, 2008

### SECTION 1: PAST ASSESSMENT RESULTS

**Brief description of changes or improvements made in your unit as the result of assessment results since 2000.**

As part of the natural growth process of the department (new head after years of acting headship, several empty faculty positions filled, changes in non-academic personnel), the graduate program has been the focus of faculty discussion.

Some of the new guidelines for the graduate program proposed by an ad hoc committee and approved by faculty vote have already been successfully implemented. The focus of the changes concern:

1. Expansion of the recruitment process including aggressive targeted advertising and interview in person or by telephone; a graduate student recruitment event by invitation with participation of the faculty and tour of the facilities is also in the plan.
2. Scrutiny and selection of student applications, which involves all the graduate faculty of the department, and discussion of the candidates' credentials and ranking of applicants in a scheduled graduate faculty meeting.
3. Establishment of a mentoring and supporting network for incoming students by assigned peers and faculty beginning before the candidate arrives on campus.
4. Rigorous guidelines for a discriminating qualifier exam that comprises a mandatory written component and an oral component.
5. A firm time frame for the various milestones of the program.
6. Mandatory attendance to a weekly journal club and department seminars.
7. Development of a team taught common course to familiarize incoming students with the areas of departmental research and encourage interaction with fellow students working in different areas of study within the department.
8. Detailed yearly written review of student progress overseen by the faculty advisory committee and head of the department.
9. Reestablishment of a combined DVM/PhD program.

### SECTION 2: REVISED ASSESSMENT PLAN

(a) **PROCESS: Brief description of the process followed to develop or revise this assessment plan.**

In 2006, an ad hoc committee was established to review the Pathobiology graduate program. This committee identified several avenues to strengthen the graduate program and their final

report, as accepted by the department's graduate faculty, is attached to this document. The report details recruitment of students, plans for strengthening the first year program, and the administrative and organizational aspects of the graduate program.

**(b) STUDENT OUTCOMES: List Unit's student learning outcomes (knowledge, skills, and attitudes).**

Candidates for the MS or PhD degree in PATH must comply with the general requirements of the Graduate College concerning hours of work, grades, residence, preliminary examination, thesis, and final examination as stated in "A Handbook for Graduate Students and Advisers" <http://www.grad.uiuc.edu/gradhandbook/default.htm>.

The graduate programs administered by the Department of Pathobiology are combined residency and graduate programs (MS, PhD and DVM/PhD) that take 3 to 7 years to complete. These programs have several well-defined bench marks for assessing the quality of its graduate students.

The residency component of the program, prepares the student to pass the certification examinations in laboratory animal medicine administered by the American Association of Laboratory Animal Science or in anatomic pathology or clinical pathology administered by the American College of Veterinary Pathologists. Lastly, graduate students are expected to obtain appropriate and meaningful employment in academia, industry, or government.

**Outcome 1.** All graduate students in Pathobiology must maintain a minimum GPA of 3.0.

**Outcome 2.** Demonstrate effective written and oral communication skills by presentation in departmental seminar courses.

**Outcome 3.** Division faculty members expect their graduate students to complete meaningful research projects which result in high-quality Masters and PhD degrees and to publish their results in peer-reviewed journals with high impact factors. As graduate students, they are also expected to submit abstracts and defend their data at national and international meetings.

**Outcome 4.** Understand the ethics of scientific research by participation in college and departmental seminars on ethics.

**Outcome 5.** All MS graduate students must perform hypothesis-driven research and gain technical expertise in the area of study. MS students must have a manuscript ready for submission or thesis on original research.

**Outcome 6.** All doctoral graduate students must teach the equivalent of one semester at 1/4 time effort. Function effectively as an instructor by performing a variety of teaching activities within the department.

**Outcome 7.** All graduate students in the PhD program are required to have written one complete grant proposal in NIH/NSF/USDA format of a hypothesis driven research project.

**Outcome 8.** All graduate students in the PhD program are required to have written at least one original, full-length published (refereed journal) or publishable manuscript on work performed as a student in our department.

**Outcome 9.** All PhD graduate students in the department must achieve a level of competency and research independence commensurate with the degree and be prepared to perform in quality postdoctoral positions or research positions in academia or industry. Doctoral students must possess comprehensive knowledge of their discipline and acquire advanced skills in their research area. They are expected to submit abstracts and defend their data at national and international meetings. PhD students must also demonstrate competency in: 1.) statistics; 2) scientific writing in the area of their research; and 3.) grant writing in NIH or USDA style.

**(c) MEASURES AND METHODS USED TO MEASURE OUTCOMES:**

1. Written annual progress reports on all graduate students, compiled by the major professor with the student response, are reviewed by the Pathobiology Graduate Advisory Committee. Feedback is provided in written format to the student and advisor. Residency progress is reviewed each semester.
2. Results of annual meetings of the Director of Graduate Programs with students in each division are summarized for the head of the department and the chairs of the divisions.
3. Exit interviews by the department head are conducted with all students leaving and summarized and provided to the Graduate Advisory Committee.
4. Teaching review of Teaching Assistants, Teaching Associates, and faculty as well as ICES scores are provided to the instructor and department head.
5. Tabular display of all graduates is updated annually with the number of publications resulting from the thesis and listing of the current employment position.
6. Students maintain current biosketches on the departmental website.

**SECTION 3: PLANS FOR USING RESULTS**

**(a) PLANS: Brief description of plans to use assessment results for program improvement.**

The outcomes assessment data will be managed by the Pathobiology Teaching Coordinator and the Director of Graduate Programs. They will report to the Pathobiology Graduate Advisory Committee who will consider the outcomes assessment data and recommend appropriate changes in the program. Changes will be submitted to the graduate faculty for a vote and implemented by

the department head which may include proposed changes in the rules governing the Pathobiology graduate programs. Those recommendations that involve the dual programs may be passed on to the Veterinary Medical Scholars and Medical Scholars Programs.

**(b) TIMELINE FOR IMPLEMENTATION:**

1. Full implementation of the revised graduate program is expected by 2009.
2. The Pathobiology graduate faculty review all graduate student and residency applications each year. At each review, faculty discuss student's needs and identify areas for improvement and make recommendations.
3. Beginning in 2008, a graduate/alumni survey will be created and sent to graduates who have recently graduated, been out two years and five years. This survey will be written to evaluate how well our graduates are prepared for the job market.

## **Report of the Ad hoc Committee for the Pathobiology Graduate Program**

Mariangela Segre, Chair; Lois Hoyer, Co-chair; Tony Goldberg, Mark Kuhlenschmidt, Carol Maddox, Amy MacNeill, Marilyn Ruiz, Eric Vimr, Matt Wallig, Jim Zachary

This report was compiled from ideas discussed at meetings of the committee (11/2/06, 11/14/06, 12/8/06 and 12/15/06) in response to questions raised in the committee charge (10/25/06). Dr. Segre presented the report to the faculty at a special faculty meeting on 2/8/07. In order to answer questions posed by the faculty, a second meeting was held on 3/16/07. Revisions suggested during these meetings were incorporated into the report or are presented as options for faculty voting.

The plans proposed in this report will probably be more successful and worthwhile when the number of graduate students to be recruited each year reaches a critical mass. However, a less ambitious version of the plan could be adopted as soon as the plans have been finalized.

### **I. Graduate Student Recruitment**

Discussions about the recruitment process mainly concerned developing an annual process for selection of an incoming graduate student class. Coordination of this process with recruitment of students to the pathology residency program and through the Medical Scholars Program (MSP) was also discussed. Because of earlier deadlines required for the pathology residency recruitment effort, combining it with the PATH graduate student recruitment is not possible. Coordination with the Medical Scholars Program recruitment efforts is more practical and can be pursued on a student-by-student basis where possible. Committee members felt it was important, however, to maintain the ability of individual faculty members to recruit students outside of the annual process. This option is discussed under Special Circumstances (section F) below.

#### **A. Advertising the graduate program**

The annual process of graduate student recruitment will begin with a vigorous advertising campaign that extends from July through the end of December. The effort will include:

1. Establishing and regular updating of an attractive departmental Web page which will include a link to a substantial summary of the departmental “Rules and Regulations for Graduate Study” manual and a link to a “Positions Available” section which will list available research positions and fellowships. The website should also include statistical data from previous years such as the percentage of applicants admitted to the graduate program, total number of fellowships and residencies, average time to complete a PhD, etc. The departmental website will also host web pages for each current graduate student that includes information such as year of matriculation, publications, presentations at meetings, dates when exams were passed, awards and honors received. Each student in the graduate program will be required to construct and update a personal web page.
2. Posting literature describing the graduate program at scientific meetings.
3. Participation in the University’s Recruitment Fair (hosted by the Career Center in September/October at the Illini Union).
4. Targeted mailings to individuals and departments that might identify prospective graduate students for our program.

## **B. Application screening process**

Applications for the graduate program will be accepted through January 10 for admission for the following Fall semester. Pathobiology office personnel will conduct initial application screening. Incomplete applications or those that do not meet minimal departmental standards will be discarded.

The current Graduate Admission Committee will be disbanded and subsequent application screening will be open to the entire departmental faculty. One week before the faculty meeting to discuss graduate applicants, complete applications will be available electronically (via NetFiles, for example) to all faculty members. During the meeting, each application will be discussed and applicants placed into one of four categories by majority vote:

1. Strongly desirable candidates presently living in the United States
2. Strongly desirable candidates presently living outside the United States
3. Acceptable candidates
4. Rejected candidates

Applicants in categories 1 through 3 will be ranked, keeping in mind those who are most likely to be funded by a fellowship. A list of applicants who will be invited to the graduate student recruitment weekend will be generated based on the distribution of candidates within the categories and available recruitment funds. Invitations to the recruitment weekend will be mailed before January 31, for the event that will take place during the first 3 weeks of February. Foreign students who are not able to attend the recruitment weekend should be interviewed by phone by a small group of faculty members.

## **C. Graduate student recruitment weekend**

Selected faculty members, current graduate students and PATH office personnel will organize the recruitment weekend. The optimal format for this event may evolve over a few years.

Each graduate applicant will be assigned to a current graduate student. The name of the assigned student will be provided in the recruitment weekend invitation letter. The student host will offer individual attention to the applicant by answering any questions the applicant may have, arranging for transportation at arrival and departure, suggesting overnight arrangements, and providing an informal campus tour. The student host will also have dinner with the applicant, potentially in larger groups that include faculty members.

Organized recruitment weekend events will include:

1. Introduction of faculty members and presentation of an overview of the graduate program at a morning lecture gathering
2. A lunchtime poster session where current graduate students describe their research projects
3. An informal tour of departmental facilities and laboratories
4. A question-and-answer session
5. Dinner and evening entertainment with a mix of faculty members and students

## **D. Final selection for admission to the graduate program**

Following the recruitment weekend, each participating faculty member will rank graduate applicants in order of preference. The Department Head will make the final decision for admission based on available positions and taking into account the opinion of faculty members who have open positions available. A waiting list will be generated to fill positions in case some applicants do not accept an admission offer. This process will be completed by March 1.

### **E. Notification letters**

By March 1st, letters of acceptance will be sent to the selected applicants. The letters must state the commitment to financial support (TA or RA position, % time and guaranteed length of support). Committee members believe that guaranteeing support to a student throughout his/her graduate program is important for recruitment of top students. The letter should state that acceptance of the offer is required by April 15, after which the offer expires. If acceptance letters are sent by E-mail, prompt acknowledgement of receipt is required.

A letter should also be sent to each student on the waiting list indicating that they are accepted into the program without financial support and providing their ranking on the waiting list. A letter should also be sent to each student who is denied admission to the graduate program.

Students who decline an offer of admission will be asked to identify the graduate program they have selected and the reasons for selecting that program. This information will be valuable for recruitment efforts in subsequent years.

### **F. Special Circumstances**

Faculty should retain the ability to recruit a student to their laboratory group, provided that the faculty member is responsible for providing funding for the duration of the student's program. Unlike students who are admitted through the annual recruitment process, students admitted by this alternate process will not be promised funding for the duration of their graduate program. Students admitted by the alternate process will require approval of the PATH faculty prior to admission.

## **II. First Year in the Graduate Program**

### **A. Events prior to arrival on campus**

Students who accept admission to the graduate program will receive a letter similar to the one that has been sent in the past. The letter will also include the contact information for the faculty member who will serve as the student's temporary advisor until a permanent research advisor and advisory committee is selected. The temporary advisor will be either the head of the division where the student's primary interest lies, or the director of graduate studies if the student is undecided. A current graduate student contact will also be assigned to each admitted student. Matching students by research interest and/or nationality (to provide information about specific international student associations on campus) would facilitate transition of the new student to the department. Association with a current graduate student will facilitate interactions with the current cohort of graduate students and foster a sense of belonging to the department.

### **B. Orientation day**

A well-structured orientation day will be held at the start of the Fall semester, when all incoming students have arrived on campus. Orientation will include:

1. A brief informational presentation outlining departmental organization and facilities
2. Short presentations by faculty members who are interested in recruiting a student to their laboratory group
3. Descriptions of courses offered in the first semester and suggestions of course combinations to take

4. Discussion of TA duties
5. Discussion of expectations for the first semester, the requirements for the PhD program, deadlines for exams and a detailed explanation of the annual review process
6. (Optional) If an expert can be found on campus, a short discussion of identifying fellowship opportunities should be presented. Students who find their own support should be rewarded with a monthly supplement to their stipend.

New students will be encouraged to visit with various faculty members, visit labs and talk to other students to begin identifying a laboratory for their research work.

Students who enter the graduate program outside of this standard timeline will attend the next available orientation session.

### **C. First semester courses and plans**

Plans for first semester courses and potential lab rotations will be decided in consultation with the student's temporary advisor. Coursework will be tailored to the student's interests and to correct any deficiencies.

### **D. Choosing a permanent advisor**

During the first and second semesters, students will interview potential research advisors. Committee members did not feel that there was a need to standardize a schedule of lab rotations and that these issues could be worked out on an individual basis. As the program grows, a more structured approach to laboratory rotations may be beneficial. There was disagreement among committee members about how to structure this effort. Some felt that a six-week lab rotation was too long and noted that they could tell within a short time period whether a student's interests and skills meshed with the lab. Some committee members felt that a few good discussions with a student is all that they need to decide if there is a match between student and lab. These committee members felt that the large amount of time that is required to supervise lab rotations is counterproductive.

### **E. Graduate student annual review process**

Some committee members felt that the current annual review process is sufficient, however, input on student performance should also be sought from the course supervisor(s) should the student have served as a TA. The point at which the current review process breaks down is in cases where the student does not perform well or the student/advisor interaction is not successful. Modifications of the current annual review form to include student and faculty input to assess the student/advisor (and/or student/advisory committee) relationship may be helpful and could avert disastrous situations before they occur. Review of student progress reports by the entire faculty was suggested, but was abandoned in favor of the review process continuing in its current fashion with the GAC conducting review of the annual forms. Problems that are detected by the GAC should be brought to the attention of the entire departmental faculty and may require intervention by the department head. The committee members agreed that solving problems early is essential to maintaining an effective graduate program. Changes in thesis committee membership should be addressed during the annual review process. Departmental and Graduate College rules will need to be followed for any changes.

Considerable discussion was had regarding mechanisms to remove a poorly performing student from the graduate program. The committee generally agreed that a qualifying exam

should be used to identify students who are likely to not succeed in their pursuit of a PhD. The departmental exam structure requires revision and is discussed below (see IIIB). The committee members felt that a Master's Degree should NOT be awarded for students who fail the qualifying exam and that these students should be dismissed from the graduate program. Beth will check with the Graduate College to see if there are campus rules requiring second chances and/or a necessary petition procedure to reinstate students in the program.

Discussion also focused on whether there should be performance-based criteria for mentoring. Committee members felt that it was not reasonable to define this process and that it was the responsibility of the department head. It was agreed that students could be indirectly steered away from bad mentors by suggesting that the student gather data regarding performance of past graduate students in the mentor's lab. Situations where the student selects an ineffective mentor and the relationship plummets or student performance suffers will need to be addressed by the department head. In extreme cases, the committee suggested that the department head request that a mentor whose performance has been repeatedly unsatisfactory be removed from the Graduate College and ineligible to supervise future graduate students. Specific procedures are already in place in the Graduate College regulations for these situations. Faculty performance in mentoring should be addressed during the annual faculty evaluation process with the head of the department.

### **III. Administrative/Organizational Aspects of the Graduate Program**

#### **A. Curriculum**

Committee members agreed that a core curriculum will not be optimal for the department graduate program and that course selection should be tailored to a student's interests and deficiencies. Some common courses could be added to increase interaction between students in the departmental graduate program. For example, a mandatory journal club that meets weekly may be beneficial. Students would receive credit for their participation, with grading based mainly on attendance. Participation in the journal club would continue throughout the graduate program, with perhaps the exception of the final year when thesis/dissertation writing is the student's focus. The journal club could also be coordinated in concert with the departmental seminar series. A Methods and Theory course could also be planned for the Fall semester of the first year. This course would consist of presentations by faculty members to address the types of research or lines of thought that are present in the department. This course would be beneficial to students as they select a research laboratory and permanent advisor. A student research retreat was also discussed, similar to the faculty retreat that was held earlier this year.

#### **B. Exams**

Exam titles within the department do not match those in other campus departments and often cause confusion for students and outside committee members. Although more discussion is required, the committee generally agreed on a format for a qualifying exam, that would test a student's general knowledge and his/her ability to express that knowledge in written and verbal formats. This exam would take the place of what has traditionally been called the preliminary exam in this department.

The qualifying exam will be taken NO LATER than the end of the second year in the graduate program. Students in the pathology residency program and Vet Med Scholars will

require different timing for the exam, placing it after completion of their second year. The qualifying exam will include a written and oral component. The written exam will include questions gathered from thesis committee members with the potential to use questions from a departmental question pool (to be developed). Thesis committee members will select the exam questions, emphasizing areas that reflect the student's interests and area of study. Since departmental faculty members are so diverse in their interests and expertise, students will be examined mainly on questions that correspond to the PATH division where their thesis advisor resides. The written exam will be open book and over the course of several days. Thesis committee members will grade the written exam, potentially in consultation with the author of an exam question, should questions be taken from the departmental pool. The result of the written exam will not be communicated to the student prior to the oral exam, which will be conducted within one week of conclusion of the written exam. The thesis committee will arrive at one grade for the qualifying exam based on the student's performance on the written and oral portions. Students who pass will continue in the program, students who fail will be dismissed from the program. Consultation with the Graduate College indicated that there is no need to administer a second chance on this exam. Should the exam be used as a means to remove poor-performing students from the program, that aspect of the exam must be well-publicized and not a surprise to those who fail.

Committee members discussed whether the thesis advisor should be excluded from attendance at all exams and feelings were mixed on this issue. Some committee members feel that the presence of senior faculty could adversely affect junior faculty in an exam setting. Others feel that they can better advise a student knowing how that student conducts him/herself in an exam setting. A compromise of having the advisor present, but requiring the advisor to leave during committee deliberations was proposed. Further discussion at the faculty meeting on March 16, 2007 did not resolve this issue, but indicated that faculty preferences are split between four options:

1. The research advisor is present and participates in the exam as well as the final outcome,
2. The research advisor is present and participates in the exam, but not in the final outcome.
3. The research advisor is present, as an observer only.
4. The research advisor is not present during the exam.

Faculty will vote for one of these four options and the most popular option will be incorporated into the final, approved document.

The prospectus exam must be completed NO LATER than the end of the third year in the graduate program. The goals of the prospectus exam and the rules governing it are adequately described in the current departmental graduate student handbook. Advisory committee changes must be made in accordance with Graduate College guidelines prior to the exam.

The final exam (dissertation defense) is described in the current graduate student handbook. Comments stating the need for a minimal time frame before the final exam is given should be removed from the handbook. The committee members generally agreed that the handbook must be revised to reflect the new changes to the graduate program. At this point, other sections, such as those dealing with the Master's degree program can be made. While the department should retain the opportunity for a student to earn a Master's degree, it is not a prerequisite for a Ph.D. Sections of the handbook that imply the need for a Master's degree prior to pursuing a Ph.D. should be revised.

**C. Funding strategies to obtain additional financial support for graduate students.**

Committee members had several ideas for supporting graduate student training. The CVM Advancement Office should take the lead in pursuing additional fellowships/endowments, as well as corporate (Pfizer, for example) and alumni support. Departmental needs in this area should be conveyed to Brenda Betts. Assistance may also be derived from the CVM administration, perhaps with ICR dollars. Pursuit of training grants as part of larger campus groups would benefit the department. Departmental leadership (Dr. Rock as PI on the proposal) would maintain our department's ability to play a lead role in certain areas such as infectious disease research on campus. Within NSF, training grants like the IGERT may be able to provide support. Other ideas included pursuing relatively unusual sources such as the GAANN program from the U.S. Department of Education that funds minority graduate students in areas of national need. Currently, biology is listed as an area of national need.