Pathobiology: doctorate, CIP Code: 26.0910

The Department of Diagnostic Medicine/Pathobiology (DM/P) is one of the three academic departments in the College of Veterinary Medicine. The DM/P is a multi-disciplinary department with faculty expertise in Bacteriology, Epidemiology and Public Health, Food Safety, Security and Policy, Immunology, Molecular Biology, Parasitology, Pathology (Anatomic and Clinical), Production Animal Medicine and Management, Toxicology, and Virology. The Pathobiology graduate program at KSU is an interdepartmental and interdisciplinary program that offers Ph.D., and combined DVM/Ph. D. degrees. It is the only program that offers a Ph. D degree in disciplines of Veterinary (or Comparative) Bacteriology, Epidemiology, Food Safety, Security, and Policy, Immunology, Parasitology, Pathology (Anatomic and Clinical), Toxicology, Virology, and Production Animal Medicine. Additionally, the Pathobiology Graduate Program encourages and offers opportunities to DVM students to concurrently work on a dual degree program (DVM/Ph. D) to gain research experience in their field of interest. The main purpose of this dual degree program is to provide selected professional veterinary students with a better understanding of research and prepare them for careers in academia or health and allied industries. This aspect of the graduate program is unique in the State of Kansas.

The departmental mission is to provide instruction, research, service, and continuing education in pathogenesis, prevention and control of infectious, non-infectious, immunological and toxicological diseases of animals and humans. In addition, the Veterinary Diagnostic Laboratory (VDL), located in the Department, provides high quality, diagnostic and consultative services to veterinarians, livestock producers, animal owners, public health officials, researchers, and commercial enterprises in and around the state of Kansas. The VDL serves the animal health and biosecurity requirements of Kansas and the surrounding region. The VDL is a full service, American Association of Veterinary Laboratory Diagnostician (AAVLD)-accredited veterinary diagnostic laboratory that has diagnostic responsibilities in both CDC's Laboratory Response Network (LRN) and the USDA/DHS's National Animal Health Laboratory Network (NAHLN). As a NAHLN laboratory, the VDL is involved in the development and implementation of standard diagnostic techniques for identification of select agents, including rapid, high-throughput technologies using modern equipment. In addition, there are experienced laboratory and clinical personnel trained in the detection of emergent, foreign and bioterrorism agents

Collectively, the faculty in the pathobiology program has a history of successful extramural funding. In fact, for 2008 the faculty in the Department of Diagnostic Medicine/Pathobiology received over $5.0 million in grant support. Only a small fraction of the grant support is intramural (Kansas State University and the State of Kansas). Because the department does not provide salary support for graduate students, their salary (about 25 to 30 students per year and approximately $600,000 per year) is entirely from extramural grants of individual faculty members. Faculty members with primary research appointment are also involved in teaching courses for professional students and graduate students. Many faculty are recognized nationally or internationally for their expertise and scientific publications of high quality.

The Pathobiology graduate program is the largest in the College of Veterinary Medicine, consisting of 42 graduate faculty members and 22 active Ph. D. students. An important aspect of this graduate program is that the basic training is received in a vibrant multi-disciplinary environment, exposing students to a variety of disciplines and research areas. Essentially, the existence of critical mass of faculty in certain disciplines (Infectious diseases, Food Safety, Toxicology, and Production Animal Medicine and Management) has been a major factor in attracting high-quality domestic and international graduate students. The quality of students that the program attracts and admits is also because recruitment is done by individual faculty, often based on their need to match the student's background and research interest. The student demand for the Pathobiology Program has always been high and the number of serious applicants has always been higher than the need of the faculty. In the past 7 years, the program has consistently maintained 25 to 30 graduate students in the program. The number of awards and scholarships received at National and International Conferences is truly reflective of the quality of students in the Pathobiology program and their research contributions.

The Ph. D. graduates from the program find employment immediately after, and often times before, graduation. The majority of graduates accept post-doctoral positions, particularly if their intention is to have an academic career, or opt for jobs in Animal Health industries.

Overall, the Pathobiology Graduate Program cooperatively provides advanced graduate, post-doctoral training, and research in areas that are not offered at any other university in Kansas. Research and

graduate training in the disciplines related to animal disease are critical to the economic success of many animal agricultural enterprises, especially in the State of Kansas.

Summarized Assessment of Student Learning – Ph.D.

Student Learning Outcomes Assessed:

1) Ability to formulate and design a hypothesis-driven research project(s), independently carry out the research methodology, critically analyze the data, and disseminate the research findings in the form of presentations at scientific meetings and peer-reviewed publications; 2) Professional and technical expertise in their chosen areas of study or disciplines; 3) Ability to apply knowledge through critical thinking, to interpret or analyze and integrate information, to respond and adapt to changing situations, to make decisions, to solve problems, and to evaluate actions; 4) Effective oral and written communication skills.

Results:

The faculty developed a list of criteria to evaluate each SLO based on a scale of 4 (exemplary) to 1 (failed to meet expectations).

- The 2006-2007 scores have higher averages across the 4 SLOs than the 2005-2006 scores.
- Results were compared across each year in the program (1st year, 2nd, 3rd, 4th) and students in their 3rd and 4th years had higher average scores overall across the 4 SLOs than 1st and 2nd year students.

Actions/Revisions:

One of the outcomes of the program assessment was the development of two graduate level courses: 1) DMP 815 - Multidisciplinary Thoughts and Presentations, a course that teaches communication (oral and writing) and critical thinking skills, and 2) a course on pathogenic mechanisms of animal viruses that has been approved and will be taught in the fall of 2009. The process of graduate student evaluation by the major professor once a year provides an opportunity for faculty to monitor student progress.