

Academic Program Review

Department of Veterinary Biosciences

College of Veterinary Medicine

The Ohio State University

2007



DEPARTMENT OF
VETERINARY BIOSCIENCES

COLLEGE OF
VETERINARY MEDICINE

THE OHIO STATE UNIVERSITY
COLLEGE OF VETERINARY MEDICINE

**Self Study Report
Department of Veterinary Biosciences
Executive Summary**

The Ohio State University, Department of Veterinary Biosciences (VBS) is one of three departments in the College of Veterinary Medicine, which is an important component of one of the most comprehensive health sciences center in America. The Department's overarching mission is to foster an environment conducive to the achievement of excellence in research, teaching, service, and outreach for the benefit of veterinary medicine and society. A principal Department mission is to discover new scientific facts and disseminate knowledge for the education and training of professional students, graduate students, and research scientists. The Department combines the disciplines of anatomy, immunology, microbiology, pathology, pharmacology, and physiology into a single academic unit. The breadth of the faculty's expertise offers exceptional opportunities for interdisciplinary research and teaching in the veterinary medical, post-DVM and graduate programs. Department faculty members organize and teach basic and selected clinical veterinary medical courses in the professional curriculum. The Department is extensively engaged in providing high quality education of graduate students by providing experienced advisors in modern and well funded laboratory facilities. Many faculty members organize courses and teach graduate students in high quality programs in the biomedical sciences and provide exceptional medical specialty training. The Department faculty is composed of 29 highly recognized members that have been significantly enhanced by the strategic hires of 7 talented new faculty members since 2003. Department faculty generated research awards has significantly expanded between 2002 to 2007, totally over \$38 million and indicate strong interdisciplinary research programs in the areas of oncology, microbiology, and immunology. The Department has a robust and high quality graduate program with ~60 students pursuing M.S. and Ph.D. degrees in experimental pathobiology, molecular biology, biochemistry, microbiology, molecular virology, and physiology. Many of the Department faculty members are jointly-appointed, often in leadership positions, in multiple colleges or research institutions throughout the University. The Department created and supports the Center for Retrovirus Research and led efforts to create focused signature programs to foster multiple missions in the College. The Department supports multiple shared resources and services to augment its missions including applied and clinical pathology, imaging, histology, molecular biology and biochemistry, mouse phenotyping and tissue banking. Department faculty members provide essential clinical laboratory services for the College and key external constituents and foster significant outreach activities of regional and national importance. Department faculty members also contribute their time and effort to a wide variety of professional services, such as grant reviews, specialty board committees, boards of professional organizations, editorial positions for academic journals, and national advisory panels. While continuing to strive for excellence, the Department faces multiple challenges including aging facilities in need of significant renovations, a highly competitive market for recruitment of talented faculty, staff, and students, and budget models that place increasing pressures on limited Department resources. The Department's extensive productive history, which was built upon the efforts of talented teams of faculty, staff, and students in the outstanding environment offered at The Ohio State University suggest that these challenges will be met in a clear strategic manner to accomplish the missions of the Department.

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Department of Veterinary Biosciences
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I. Overview of Unit

A. Overall Description of Department: The Department of Veterinary Biosciences (VBS) is one of three departments in the College of Veterinary Medicine. The Ohio State University (OSU) College of Veterinary Medicine is an important component of one of the most comprehensive health sciences center in America, which includes the Colleges of Veterinary Medicine, Public Health, Medicine, Pharmacy, Dentistry, Optometry, Nursing, and Allied Health Sciences on a single campus. Among other resources, OSU has a National Cancer Institute designated Comprehensive Cancer Center (OSUCCC) and the Dorothy Davis Heart Lung Research Institute (DHLRI). The OSUCCC is a network of seven interdisciplinary programs comprising more than 250 members from 14 of the 21 colleges at OSU as well as affiliated institutions including the Columbus Nationwide Children's Hospital and the Cincinnati Children's Hospital Medical Center. The DHLRI opened in 2000 and includes advanced interdisciplinary facilities in a seven floor, 100,000 sq. ft. facility that offers research space for up to 50 principal investigators. Numerous shared resources or core laboratories of the OSUCCC and DHLRI offer innovative and state-of-the-art equipment and technologies to support all aspects of basic and clinical research.

The VBS Department combines the disciplines of veterinary anatomy, immunology, microbiology, pathology, pharmacology, and physiology into a single academic unit. The breadth of the faculty's expertise offers exceptional opportunities for interdisciplinary research and teaching in the veterinary medical, post-DVM and graduate programs. Department faculty members serve as team leaders or members to organize and teach basic and selected clinical veterinary medical sciences in the professional curriculum. Equally important is the mission to educate graduate students by providing experienced graduate advisors, modern laboratory facilities. Many faculty members organize and teach biomedical sciences in the graduate curriculum and provide high quality medical specialty training. The Department has a long and successful track record of training research pathologists, incorporating elements of both residency training and graduate education into a unified program. The Department is privileged to have outstanding senior faculty including 5 OSU recognized Distinguished Scholars, 7 Fellows of the American Association of the Advancement of Sciences (AAAS), a member of the National Academy of Sciences, Institute of Medicine and Distinguished University Professor, and numerous national leaders in education, research, and American Veterinary Medical Association (AVMA) recognized board certified disciplines. These have been complimented by strategic hires of talented new faculty members (7 since 2003).

There are currently 29 regular faculty members in the Department involved in research, education, service, and outreach activities. Research awards, over the last five years (2002 - 2007) total over \$38 million and indicate strong interdisciplinary research programs in the areas of oncology, microbiology, and immunology. The Department has a robust and high quality graduate program with approximately 60 department-based or interdisciplinary graduate program students pursuing M.S. and Ph.D. degrees in experimental pathobiology, molecular biology, biochemistry, microbiology, molecular virology, and physiology. Many of the Department faculty members are jointly-appointed in the Colleges of Medicine or Biological Sciences, members of the OSUCCC or DHLRI or interdisciplinary research groups, and members of interdisciplinary graduate education programs in molecular, cellular and developmental biology or biochemistry. The Department

created and supports the Center for Retrovirus Research and led efforts to create college-wide signature programs in comparative oncology, infectious diseases, and imaging. The Department supports multiple shared resources and services including applied pathology, clinical pathology, imaging, immunohistochemistry and histology, molecular biology and biochemistry, and mouse phenotyping. Departmental facilities are extensive and include modern research laboratories, and well equipped centralized core service laboratories that support a wide range of research, educational, and service activities. Department faculty members provide critical clinical laboratory services for the College and key external constituents and are engaged in significant outreach activities of regional and national importance. VBS faculty members also contribute their time and effort to a wide variety of professional services, such as grant reviews (e.g., NIH), specialty board examination committees, executive boards of professional organizations, editorial boards and editorship for academic journals, and national advisory panels.

B. Mission: The mission of the Department is to foster an environment conducive to the achievement of excellence in teaching and advising, research and scholarly activity in basic and applied veterinary medical science for the general benefit of veterinary medicine and society. An overarching goal of the mission is to discover new scientific facts and disseminate knowledge for the education and training of professional students, graduate students, and research scientists. Goals developed by the Department provide focus and direction to its mission. Desired levels of achievement are identified and incorporated into a Department *Strategic Plan* available as a PDF file on the Department's website <http://www.vet.ohio-state.edu/biosciences.htm>.

The mission of the Department is accomplished through four activities: education, research, outreach, and service. A primary education mission is to organize and teach all basic and selected applied and clinical veterinary medical sciences in the professional curriculum. Equally important is the mission to educate graduate students by providing experienced graduate advisors, state-of-the-art laboratory facilities, and programs for graduate education and specialty board preparation. The research mission is to have all faculty members engaged in basic, translational or applied research that will generate new knowledge and enhance the education of veterinary medical and graduate students. Faculty members disseminate knowledge through timely publication, teaching, and other scholarly endeavors. In the Department, outreach and engagement is defined as meaningful and mutually beneficial collaborations with partners outside the academic community. Department partners in this mission include institutions and individuals in education, business, and public or social service. Faculty, staff, and student members engaged in outreach and engagement are recognized for their efforts and outcomes from these activities will enhance other missions of the Department and expand the impact of the faculty, staff, and students' contributions to the University and society. The service mission encompasses the clinical laboratories, and professional, and administrative services. The clinical laboratories provide diagnostic services to the OSU Veterinary Teaching Hospital and the veterinary medical community in the State of Ohio. These laboratories have a dual function of service and teaching, and provide a major contribution to the education of veterinary medical students and the preparation of postdoctoral students for specialty board certification. Professional service is accomplished through dissemination of knowledge to the biomedical and veterinary medical communities and to the citizens of the state. Faculty members are also expected to

contribute their time and effort to professional services at the national and international level to enhance the Department's reputation and extend its missions impact beyond the University. These include such activities as grant reviews, specialty board examination committees, executive boards of professional organizations, editorial board membership, continuing education programs, and editorship for academic journals. Administrative service involves active faculty participation in the governance of the Department, College, and University. Faculty and staff development is essential to fulfill the Department's missions in education, research, outreach and service. The Department is committed to recruitment of the finest faculty available in areas of need and opportunity; nurture the career development of new and existing faculty, and maintaining an environment that facilitates high-quality scholarly productivity.

II. Faculty

A. Goals in Faculty Recruitment and Definitions: The department strives to recruit the finest faculty members available in selected areas, nurture the career development of new and existing faculty members, and maintain an environment that facilitates high quality research productivity and promotes excellence in teaching, service, and outreach. The Department defines faculty according to criteria established in rules of the University Board of Trustees (<http://trustees.osu.edu/rules7/ru7-01.php>). As used in these rules the term "faculty" includes persons appointed by the board of trustees with regular tenure-track, regular clinical, regular research, auxiliary, and emeritus faculty titles on full- or part-time appointments, with or without salary. This report is focused primarily on regular track faculty whose primary appointment is in VBS. A complete listing of faculty in all categories is provided on the Department website: <http://www.vet.ohio-state.edu/210.htm> .

B. Expectations of Department Faculty Members: Each faculty member with a research appointment (e.g., regular tenure-track, research track) is expected to have a focused program of research leading to recognized stature at national and international levels. The focus and scope of a faculty member's research program should reflect professional interests as well as Department goals, including serving as a basis for graduate education and research training. Faculty members are expected to obtain sponsored funding to support their research programs. Published accounts of research, particularly peer-reviewed publications in scholarly journals, are the primary indicators of research productivity. In addition, all regular tenure track or research track faculty members or their graduate students are expected to present the results of their research at regional, national or international meetings or workshops on a regular basis to solicit greater peer-review and enhance the overall recognition of the individual's and the Department's research programs.

In the professional curriculum, there are two primary categories of courses taught: core and elective courses. For core courses, the Chair assigns or approves assignment of faculty to teaching and course implementation teams according to their interests, appointment status, expertise and availability. Elective courses are designed and taught by faculty members as individuals or in small groups based upon their interests, expertise and perceived need for such a course and may be available to both veterinary professional students and graduate students. Every faculty member is expected to have at least OSU Graduate School category "M status" (may serve as primary advisor for a MS student) and is assigned an appropriate level of teaching responsibility in one or more of the Department

graduate courses. All eligible faculty members are encouraged to advise graduate students and seek funds to support their stipend and research projects. Faculty members are expected to be available for interaction with students, service assignments, and other responsibilities even if they have no formal course assignment during the quarter.

Veterinary Biosciences faculty members are expected to engage in various aspects of service, which include Department, College, and University service, but also service to national organizations. The Chair's approval of service assignments will be balanced between the overall level and scope of service demands placed on the Department and the availability and stage of a faculty member's career development.

Department faculty members are encouraged to contribute to meaningful and significant outreach and engagement exemplified by productive collaborations with partners outside the academic community. Faculty members involved in outreach activities are associated with institutions and individuals in education, business, and public or social services. Faculty members engaged in outreach and engagement are recognized for their efforts and outcomes from these activities that enhance other missions of the Department and increase the impact of their contributions to the University and society.

C. Evidence of Faculty Quality of Teaching/Research/Service: One form of assessment of a quality faculty is awards and other forms of recognition for teaching excellence, research productivity, or outstanding service contributions. The VBS Department Faculty has been highly recognized in all of these categories.

College Level Awards:

Eleven Departmental faculty members (Kociba 1976, Meyer 1981, Marais 1984, Masty 1992, Krakowka 1993, Hunter 1995, Weisbrode 1996, Hamlin 1997, DeWille 1999, Nagode 2005, Wellman 2006) have been awarded the *Carl J Norden Distinguished Teaching Award*. This award recognizes one professor teaching in the veterinary curriculum each year that demonstrates excellence in teaching and devotion to education innovation in the classroom. Nomination and selection of this award is based upon professional veterinary student input and he/she must be a full-time member of the veterinary medical faculty.

The *Dean's Award for Creativity in Teaching* has been awarded to 3 faculty members (Masty 1997, Inpanbutr 2002, Brooks 2005) in the Department. This award recognizes teaching innovations and creativity that enhance the education of veterinary students. The goal of the award is to motivate risk taking in the implementation of innovative approaches to veterinary medical education. The award is not an annual award but is given on those occasions when such individuals are identified.

The *Charles C. Capen Teaching Excellence Award* has been awarded to 11 faculty members in the Department (Capen 1993, Weisbrode 1994, Krakowka 1997, Rosol 1998, Lairmore 1999, Mathes 2000, Rikihisa 2001, Brooks 2002, Oglesbee 2004, Hamlin 2005, Boris-Lawrie 2006). This award serves to honor faculty members who excel in their roles as advisors and mentors for M.S. and Ph.D. candidates, as participants in departmental graduate programs, or as resource persons for the graduate students of the College.

Twelve Department faculty members have received the *Pfizer Research Award* (formerly SmithKline Beecham Research Award) including Rosol 1991, Rikihisa 1992, Kociba 1993, Mathes 1994, Lairmore 1995, Oglesbee 1996, Rikihisa 1997, Eaton 1999, Green 2000, Boris-Lawrie 2001, DeWille 2002, and Drs. Kusewitt 2003. Nominees for this award should be the principal investigator in research conducted over the past three years that shows promise of attaining national recognition, be a member of the College of Veterinary Medicine faculty, and be nominated by a faculty member.

Drs. Gary Kociba (2002) and staff member Kathleen Hayes-Ozello (2006) have been awarded the *William L. Ingalls Award for Exceptional Service*. This award recognizes individuals who have provided exceptional service to the College. Recipients of the award shall have demonstrated continued dedication to the College and will have had a sustained impact on its programs. The award is not an annual award but will be given on those occasions when such individuals are identified. The award will be presented on an appropriate occasion as determined by the Dean of the College.

University Level:

As a measure of outstanding teaching, 3 faculty members (Hamlin 1983, Masty 1996, DeWille 2003) were awarded the *OSU Alumni Award for Distinguished Teaching*. This Award honors faculty members for superior teaching. Recipients are nominated by present and former students and colleagues and are chosen by a committee of alumni, students, and faculty. They receive a cash award of \$3000, made possible by contributions from the Alumni Association, friends of Ohio State, and the Office of Academic Affairs. They also receive a \$1,200 increase in their base salaries from the Office of Academic Affairs. The recipients are inducted into the OSU Academy of Teaching, which provides leadership for the improvement of teaching at the University.

In 2006, Dr. Robert Hamlin was selected by the University as a *University Distinguished Lecturer*. The University Distinguished Lecture Series annually recognizes two senior faculty members for their outstanding academic achievement, particularly - but not exclusively - in research, scholarship or creative activity. Each recipient presents a scholarly lecture, open to the university community and to the public, followed by a reception. The lecturer receives an award of \$5,000 from the Office of Academic Affairs to be spent in support of an academic program or project of his or her choice.

Five faculty members in the Department have been recognized as *University Distinguished Scholars* (Drs. Capen 1993, Rikihisa 1999, Lairmore 2004, Mathes 2005, Rosol 2006). The Distinguished Scholar Award, established in 1978, recognizes exceptional scholarly accomplishments by senior professors who have compiled a substantial body of research, as well as the work of younger faculty members who have demonstrated great scholarly potential. The award is supported by the Office of Research. Recipients are nominated by their departments and chosen by a committee of senior faculty, including several past recipients of the award. Distinguished Scholars receive a \$3,000 honorarium and a research grant of \$20,000 to be used over the next three years.

Dr. Lynne Olson in 2006 was awarded the *Faculty Award for Distinguished University Service*, which recognizes up to three faculty members annually whose contributions to the

development and implementation of university policies and programs through non-administrative roles have been extensive and have made clear and significant impact on the quality of the University. Nominees will have served in leadership roles (either elected or appointed), on university-level committees, or in similar capacities and should have evidence of continuing effective teaching and an active program of research, scholarship, or creative work. The Office of Academic Affairs presents recipients with a \$3,000 cash award and an increase of \$1,200 to their base salary.

Dr. Nong Inpanbutr also in 2006 was awarded the *University Distinguished Diversity Enhancement Award*. This award annually honors five individuals (faculty, staff, students, and alumni), offices, departments or organizations that have developed and implemented programs, policies and/or procedures that have demonstrated a significant commitment to enhance diversity at Ohio State. Recipients are awarded \$1,200 by the University Senate Committee on Diversity and the Office of Human Resources.

The Office of Academic Affairs awarded Dr. Charles Capen the title of *Distinguished University Professor in 2001*, which is awarded on a competitive basis to full professors who have truly exceptional records in teaching, in research, scholarly or creative work, and in service. Successful candidates will have accomplishments that are both distinguished and distinctive. One to three appointments will be made annually to faculty members who have been at OSU for at least 5 years. Recipients are awarded an annual budget of \$10,000 for a period of three years to be used to support their academic work and are expected to maintain a regular program of teaching, research, scholarly or creative work, and service.

National Level:

The American Association for the Advancement of Sciences (AAAS) has elected 7 Department faculty members as *AAAS Fellows* since 2004 (Drs. Capen 2006, Green 2006, Rosol 2004, Rikihisa 2005, Mathes 2004, Lairmore 2005, and Boris-Lawrie 2007). The American Association for the Advancement of Sciences is the world's largest federation of scientists and works to advance science for human well-being. The association manages projects, programs, and publications in the areas of science policy, science education, and international scientific cooperation. Members of the AAAS are elevated to the rank of fellow for their efforts in advancing science or fostering scientifically or socially distinguished applications.

Dr. Charles Capen, a Distinguished Member, American College of Veterinary Pathologists (1999) is also a member of the *National Academy of Sciences Institute of Medicine*, and has been recognized for outstanding contributions to animal clinical chemistry by the American Association for Clinical Chemistry (2004), and for a *Career Achievement Award*, Society of Toxicologic Pathology in 2005.

Dr. Steven Krakowka was named as one of the most cited authors in veterinary medicine between 1994 and 2004 by *Science Watch* in their May/June 2005 issue. Dr. Krakowka was ranked eleventh with 849 total citations.

Selected additional evidence of the quality of the VBS faculty include the following; (documented in supplemental material):

- Numerous faculty members serve on NIH and other grant review panels and editorial boards and editors of scientific journals
- Several faculty members are leaders of national organizations related to their discipline e.g., President of the American College of Veterinary Pathologists (Drs. Capen, Weisbrode, Stromberg, most recently), American Society of Veterinary Clinical Pathologists (Drs. Wellman and Radin), and the American College of Veterinary Anatomist (Dr. Inpanbutr).
- Numerous faculty members are in leadership positions in the University e.g., University Senate, OSU Comprehensive Cancer Center, etc.
- VBS faculty members developed and now lead signature programs in Comparative Oncology and Infectious Diseases and Provost Targeted Investment for Excellence Programs: Public Health Preparedness for Infectious Diseases and Cancer and MicroRNA.
- Department faculty members have directed a National Institutes of Health (NIH) T-32 Training Grant since 2003 and numerous NIH and OSU fellowships have been awarded to our graduate students.
- The Center for Retrovirus Research is focused in the Department; faculty within the Center developed and successfully led the first NIH Program Project Grant awarded to the College and developed the first feline leukemia virus vaccine commercially marketed.
- VBS Faculty members publish in high quality scientific journals e.g., Nature Structural Biology, Proceedings of National Academy Sciences, etc.
- Faculty members developed and now lead the successful and expanding Veterinary Student Summer Research Program for the College.

D. Mentoring and Career Support of Faculty

Mentoring: Faculty mentoring begins with all initial appointments in the Department and is intended to be a useful way of helping new faculty members adjust to their new environment and set career goals congruent with their appointment. The philosophy of the Department is to encourage well-respected mentors to supplement the guidance and assistance that the Department Chair provides during the early phases of a faculty member's career at OSU. The mentoring program's success depends on the combined time and efforts of the new faculty member, their mentors and the VBS Department Chair. Each takes an active role in the career development process.

As soon as the appointment is made, the VBS Department Chair asks the new faculty member to identify at least 3 faculty members as a mentoring committee and to document

the formation and proposed interactions in a letter addressed to the Chair. For faculty members appointed as associate professor or professor, assignment of a mentor is less critical, but highly encouraged, to serve as a means of acclimating the new faculty member to OSU. The Chair is responsible for advising new faculty on matters pertaining to academic reviews and advancement. The annual review process for non-tenured faculty members is supplemented with frequent informal meetings to obtain updates of career progress. The Chair provides each new faculty member a current copy of the Patterns of Administration and Appointment, Promotion, and Tenure document. In addition, the Chair advises each new faculty member and all faculty members annually about the requirements of promotion and the process of obtaining career advancement.

The mentoring committee members are encouraged to contact the new faculty member in advance of his/her arrival at the University and then meet with the new faculty member on a regular basis over at least the first two to five years of appointment. The mentors direct new faculty to resources (e.g., personnel, programs, etc.) and provide informal advice to help the new faculty member on aspects of teaching, research and committee work. They also provide critiques of manuscripts, grant applications, provide advice on appropriate committee assignments, and activities that benefit the career development of the new faculty member. The mentors are asked to treat all interactions and discussions in confidence. There is no evaluation or assessment of the new faculty member on the part of the mentor committee, only supportive guidance and constructive feedback.

The new faculty member is instructed at meetings with the Chair to inform the mentoring committee of any problems or concerns as they arise. New faculty are instructed by the Chair to leave sufficient time in the grant proposal and paper submission process to allow his/her mentors the opportunity to review and critique drafts. At annual reviews and during periodic informal meetings with the Chair, the new faculty member is asked to update the Chair on the frequency of meetings with the mentors and to determine if the relationship with mentors is productive and serves a positive role in the faculty members efforts to accomplish his/her career goals.

Career Support: To support the career of faculty members the Department supports professional leave proposals to emphasize enhancement of research skills and knowledge. However, a *Faculty Professional Leave* (FPL) may be used for substantial investment in pedagogical or administrative skills and knowledge when these are judged to be mutually beneficial to the faculty member and the Department or College. The Ohio State University Board of Trustees approved a Faculty Professional Leave Program for this institution on 9/9/77 (Resolution No. 78-21) based on Statute 3345.28 of the [Ohio Revised Code](#). Details of the OSU Policies on Faculty Professional Leaves were updated March 2, 2007 and can be found in the current OAA handbook at: http://oaa.osu.edu/handbook/ix_fpl.html. The FPL program was created to give faculty a period of uninterrupted time to invest in their professional development. In evaluating FPL proposals, the Department Chair and Faculty Advisory Committee (FAC) places greatest weight on the merits of the proposal in light of the professional development of the faculty member and the advancement of the academic mission of the department and college. Although there are many advantages to spending the FPL at another university or in industry or at some other appropriate institution, such an appointment is not essential if the plan for the leave is meritorious in its own right. The FPL Program is considered for any period of intensive study or research not to exceed one

academic year. A multiyear FPL need not be for a continuous period and may bridge an off-duty quarter or semester. An SRA and an FPL may occur in contiguous on-duty quarters or semesters. An FPL will not be granted for less than one quarter. Further definitions and guidelines for calculation of years of service and compensation calculations are in the currently approved OAA Handbook (http://oaa.osu.edu/handbook/ix_fpl.html).

The Department also supports a Special Research Assignment (SRA), which releases a faculty member from regular duties for a period of up to one full quarter or semester so that he or she may concentrate on a scholarly endeavor or invest in a relatively brief professional development opportunity. The Department Chair in consultation with the Department FAC will evaluate SRA proposals to assure that the faculty member's plan will both benefit the faculty member and advance the academic mission of the department and college. An SRA may be completed on campus or away from campus. SRA proposals generally emphasize completion of a research project or enhancement of research skills and knowledge. However, an SRA may be used for investment in pedagogical or administrative skills and knowledge when these are judged to be mutually beneficial to the faculty member and his or her academic unit. SRAs are not to be used for course development or service assignments. An SRA is normally granted for one academic quarter or semester. However, SRAs of shorter duration are permitted. SRAs will not be granted unless the faculty member can be released from most duties. SRAs are to be awarded on a competitive basis within the Department should more than one application per quarter be received by the Chair. Further details are available in the Department Patterns (revised September 2007).

An unpaid leave of absence (LOA) may be requested by a Department faculty member for personal or professional reasons. Personal reasons may include family difficulties or other matters that prevent a faculty member from carrying out duties for a relatively short period of time or illness that continues after a faculty member has used up paid sick leave. Paid sick leave should always be used before a leave of absence is granted for illness. In the event that the illness turns out to be long-term and disability retirement becomes necessary, the State Teachers Retirement System (STRS) will not consider disability retirement until paid sick leave has been exhausted. Professional reasons include the opportunity to take a temporary paid position outside the University that will enhance professional development and increase the faculty member's value to the academic unit upon his or her return (also see [Entrepreneurial Leave of Absence](#) - below). Procedures for a LOA follow the processes outline in the current OSU Office of Academic Affairs Handbook.

Entrepreneurial unpaid leave of absence has recently been approved by OSU. If a company offers a regular paid position to a faculty member because of his or her expertise with a particular technical problem or process, an entrepreneurial unpaid LOA, not to exceed two years, may be appropriate. In this circumstance, the Department will follow current OAA policies and guidelines as outlined in the current OAA Handbook.

Faculty members are allowed to engage in paid external consulting to the extent that these activities are clearly related to the mission of the University and the expertise of the faculty member; provide direct or indirect benefits to the University and do not entail a conflict of interest or commitment as defined in the current College and OSU Conflict of Interest and Commitment Policy <http://oaa.osu.edu/handbook/conflictofcommitment.html>; infringe on the University's intellectual property rights or; are in violation of State of Ohio laws.

Career Support for Women Faculty; Significant strides have been achieved in promoting women faculty since 2003 in the Department. Women faculty numbers have increased from 8 to 10 during this time period and the percentage of women faculty who obtained full professors rank increased from 25% (2 out of 8 in 2003) to 60% (6 out of 10 in 2007) over the past 4 years (Fig. 1). This has been coupled to an increased presence of women in departmental leadership positions such as the Chair of the Faculty Advisory Committee and Excellence in Education Committee. Leadership workshops and courses, which selectively target women faculty have been promoted by College and Department leaders and attended by VBS women faculty e.g., Dr. Burkhard – President and Provost Leadership Institute and The Art of Hosting Conversations that Matter, Dr. Inpanbutr – President’s Council for Women, Dr. Wellman – AAVMC Leadership Workshop. During this time period 2 women faculty have served as presidents of national organizations in their discipline; Dr. Inpanbutr (American Association of Veterinary Anatomists) and Dr. Radin (American Society of Veterinary Clinical Pathologists). Women faculty members have been recognized for their leadership roles in diversity enhancement (Dr. Inpanbutr) and service (Dr. Olson) based on their departmental nomination. Department nominee, Dr. Boris-Lawrie was selected in 2006 as “Outstanding Woman in Science” by the Women in Science Organization in Central Ohio and was recently selected as Fellow of the American Association for the Advancement of Sciences (2007). Drs. Rush and Burkhard serve as key leaders of the first 2 signature programs developed in the College. Dr. Tracey Papenfuss in 2007 was selected as the sole University nominee for the Pew Scholars Program in Biomedical Sciences.

Parallel statistics for male faculty in the Department from 2003 to 2007 indicate a stable group dynamics in rank and numbers. Despite some faculty member retirements of male faculty, recent hires have kept the number of male faculty at 19 in 2007, no change since 2003 in number of total faculty with similar rank distributions (Fig. 2). Male faculty members have been promoted to leadership positions and are offered leadership opportunities in parallel to female faculty. In addition to the Department Chair position, notably positions that male faculty members currently lead include the Promotion and Tenure and Graduate Studies Committees. Male faculty members from VBS have been promoted to Associate Dean of Research (Dr. Mathes) and Dean of the College (Dr. Rosol).

E. Work and Life Issues: The Department promotes a safe and healthy work environment. Annual sponsored events include a summer picnic and a

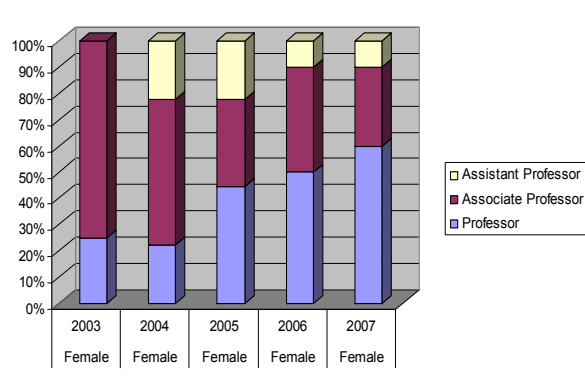


Figure 1. VBS Female Faculty by Rank

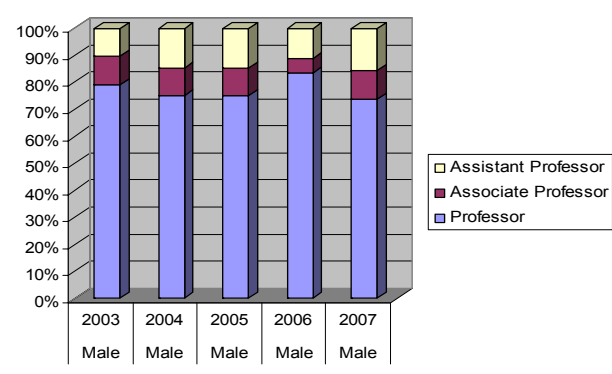


Figure 2. VBS Male Faculty by Rank

winter holiday party. Each of these events is held offsite and includes food and entertainment. Staff and student award ceremonies are conducted during these events. Additional events are sponsored periodically by the Department and include receptions for new staff introductions, photo gallery openings (Goss Lab), and other unique events (e.g., Department Chairs Ice Cream Social). To raise the awareness of work life issues Dr. Lairmore created and charged a Department Quality of Life Committee in February of 2006 to provide feedback from faculty, staff, and students on issues related to work-life policies for the department, ideas to encourage collegial work place interactions, help plan social events, launch projects to help graduate students who seek careers in academia, and promote health related activities. Specific projects completed by the committee include: planning and ordering furniture for a lunch/break area in Goss Lobby area, hosting a seminar by Ms. Shari Mickey-Boggs, Director of Work Life and Special Projects, The Ohio State University, organizing photo gallery openings and ice cream afternoon events.

F. Diversity: The Department submits annual reports to document progress on diversity action plans and progress in meeting OSU and Department's goals in diversity. The Department of Veterinary Biosciences has worked closely with the OSU Graduate School, which provides both leadership and support in the recruitment and retention of underrepresented racial/ethnic faculty and graduate students in a number of special programs dedicated to cultural diversity. The Department training program has access to all of these programs. In addition, the training program has a specific plan of recruitment to further supplement these efforts by the University. The percentage of accepted applicants from underrepresented racial or ethnic groups to all Colleges of Veterinary Medicine in the United States is ~8.0% (predominantly from Tuskegee Institute) and those accepted to the OSU College of Veterinary Medicine was 3.0% similar to all veterinary colleges in the United States except Tuskegee. From the demographic data described above, and the data on Ph.D. degrees awarded in the biological sciences, the expected scenario for our Ph.D. program in mouse pathobiology would be projected to include 5% or less minority representation and a balanced gender ratio. This indicates that the program must take an active and ongoing role in the recruitment of trainees as outlined below. Strategic plans include an aggressive series of goals and plans to improve diversity in the department in faculty and staff hires as well as graduate student recruitment.

The percentage of College tenured/tenure track female faculty has increased from 20% to 26.5% over the previous 5 years similar to other veterinary medicine institutions. The College hired 2 African American faculty members in 2006. The numbers of veterinary students of color has increased over that time; from 6 in the class of 2008, to 10 in the class of 2009, and 13 in the class of 2010. The average graduating class size over this time period has remained approximately 140 students. Ms. Lisa Greenhill Director for Diversity for the American Associate for Veterinary Colleges was invited to assess the minority friendly environment at the OSU-CVM. The following action items agree with her recommendations: 1) The College hired a devoted recruitment officer to establish relationships with historically black colleges and increase recruitment efforts. Guest speakers will address the incoming class during their orientation to raise awareness of issues of minority students.

Department of Veterinary Bioscience Achievements: Faculty members have actively participated in programs to provide research training for underrepresented racial and ethnic

groups and actively recruited faculty and staff from underrepresented minority groups (Table 1).

Table 1. Recent Achievements in Minority Recruitment and Retention	
Year	Achievements
2007	Hired Maria Anderson (African American) as Business Manager This senior level staff hire is critical to the administration of the Department and provides a strong role model for faculty, staff, and students.
2006	Hired Prosper Boyoka (French African) as Associate Professor Dr. Boyoka will contribute to the long-term strategies to enhance diversity through his appointment on the <u>Minority Affair Committee of the American Association of Immunologists (AAI)</u> which develops networking that support women scientists and underrepresented minority scientists. These networks will be used to encourage the application to OSU of high quality women and underrepresented scientists. It is important that we emphasize quality for any effort to enhance diversity to be meaningful and beneficial to the College and the University in general.
2005-2006	Dr. Nong Inpanbutr was awarded the University Distinguished Diversity Award by the Provost in 2006! In addition, she continued to make important service contributions a member of the OSU Advisory Committee of the University Multicultural Center, participate in the Asian Festival of Columbus, and through the American Association of Veterinary Anatomists. She also served the Office of Undergraduate Admissions and First Year Experience, participated in the Graham High School Research Internship program, co-advised a group of veterinary students, and served as judge for the Ohio Science Day.
2005	Hired Angie Morris (African American) Educational Resource Staff. Angie is a primary contact regarding medical records and educational materials in the Department.
2005-2007	Several Faculty members – Ohio Science Day judges and visits to local middle schools and high schools to discuss veterinary careers.
2002-2007	In past 5 years, the Department has 7 new faculty hires, of which 4 were women and 1 was a French African enhancing diversity among the faculty. During same time period, 4 women were promoted.
2003-2007	Research Internship Program for underrepresented minority high school students interested in biomedical research career paths, which was established in 2003 and continued in 2004 and 2005. Planned visits in late 2006 and early 2007. The program involves the Graham School--a public charter school in Columbus that works with disadvantaged minority students.
2005-2006	Foreign Study Elective Course, VBS 693. - with Chiang Mai University in Thailand, Dr. N. Inpanbutr - program for veterinary students to study exotic animals
2003-2007	Continued support for funding for a National Institutes of Health Supplement Grants e.g., African American graduate student, Mr.

	Rashade Haynes. This NIH Supplement for Underrepresented Minorities Award provides three years of stipend and training support (~\$48,500) for Mr. Rashade Haynes, a graduate research associate that has recently joined a team of investigators funded by a program project grant (CA 100730) funded from the National Cancer Institute entitled, "Retroviral Models of Lymphocyte Transformation and Disease.
2006 - Current	Dr. Nadine Bowden (highly qualified African American) was actively recruited into the graduate program and received an OSU University Enrichment Fellowship
2006-2007	Drs. Lairmore and Inpanbutr -co-principal investigator for Banfield and OSU CARES grant to develop website and outreach materials to enhance underrepresented minorities in veterinary medical careers.
2006	Dr. Rosol attended 12 th Annual National Conference on Diversity, Race & Learning; '2006 & Beyond: Creating Diversity Collaborative'
2006	Dr. Rosol - Mentor and advisor for Ramiro Toribio, DVM (Hispanic). Dr. Toribio completed his PhD in experimental pathobiology in 2002 in Dr. Rosol's laboratory was awarded a K01 from NCCR in 2004 and is currently an assistant professor in the Department of Veterinary Clinical Sciences in our College.
2005	Dr. Lairmore developed new outreach program e.g., The VBS Department participated in the " Gifted and Talented " Program" of the Shepard Center, Columbus Public Schools to provide anatomy materials for Gifted & Talented Specialist
2005	Dr. Rosol attended Invisible Barriers for the Success of Women at OSU Workshop
2005	Dr. Rosol hosted Ms. Lisa Greenhill, American Association of Veterinary Medical Colleges, Director of Diversity visit to College; discussions, evaluation of progress, and recommendations
2005	Dr. Rosol attended 11 th Annual National Conference on Diversity, Race & Learning; 'Liberty & Justice for All: Empowerment & Inclusion'.

Department Goals and Plans in Diversity Enhancement: Enhance diversity among faculty, staff, and students through the hiring and retention of qualified women and under represented minorities.

Short-term Strategies incorporated into our Faculty, Staff, and Student Recruitment Efforts:

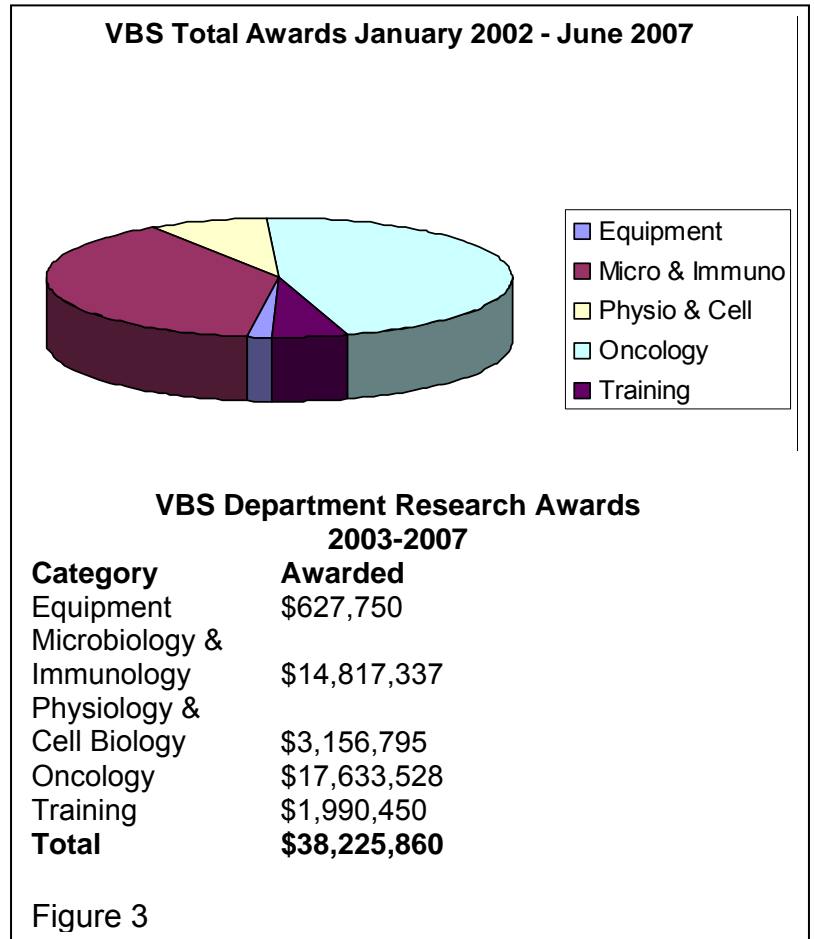
- Utilize program faculty to directly assist in recruitment of women faculty and faculty from underrepresented racial and ethnic groups by funding visits to colleges or research institutions that train qualified women and underrepresented minority scientists. A Graduate Coordinator (Ms. Janelle Henderson) ensures that all female or minority recruits to ensure they meet with as many female or minority faculty members as possible to showcase our diversity.

- Use existing programs at OSU including those sponsored by the Office of Minority Affairs (OSU) to recruit research scientists at OSU to improve the visibility and exposure of underrepresented groups to research opportunities and faculty positions.
- Incorporate staff members of the Office of Minority Affairs into recruitment efforts. Recruitment efforts should include visits to the Office of Minority Affairs by all appropriate faculty recruits brought to visit the OSU campus. During this visit the staff will orient the prospective recruit on the various activities on campus for social events, retention services, and cultural activities that encourage and support underrepresented minorities.
- Closely monitor women and underrepresented minority faculty's academic progress through the Faculty Advisory Committees to ensure that there is professional and social/cultural support for these scientists.
- Personal interviews should be conducted by the Chair of the Department to ensure the comfort level of each faculty on a regular basis. This will provide a setting for the faculty member to voice concerns or suggestions for the academic program or broader issues relevant to completion of research plans and to enhance involvement with interdisciplinary research groups on campus.

Long-term Strategies:

- Pursue internal and external funding from programs that support research participation of women and under represented minority scientists, for funds to invite underrepresented racial/ethnic groups to visit OSU, and to conduct receptions/special programs for prospective scientists.
- Distribute targeted recruitment brochures and provide specific announcements via our website to encourage the application of women and underrepresented racial/ethnic scientists at the pre-doctoral, professional, and post-doctoral level. In 2005-2006 we have continued targeted mailings to Historically Black Colleges and Universities and plans include more focused campus visits.
- Promote networking with other groups that support women scientists and underrepresented minority scientists at OSU. Events at OSU are forwarded by e-mail and by sending out announcements, scholarships, etc. to our graduate students

III. Research: Each faculty member with a research appointment (e.g., regular tenure-track, research track) is expected to have a focused program of research leading to recognized stature at national and international levels. The focus and scope of a faculty member's research program should reflect professional interests as well as Department goals, including serving as a basis for graduate education and research training. Faculty members are expected to obtain extramural and intramural funding to support their research programs. Published accounts of research, particularly peer-reviewed publications in scholarly journals, are the primary indicators of research productivity. In addition, all regular tenure track or research track faculty members or their graduate students are expected to present the results of their research at regional, national or international meetings or workshops on a regular basis to solicit greater peer-review and enhance the overall recognition of the individual's and the Department's research programs.



A. Research Foci and Strategic Initiatives to Enhance Research Productivity:

The VBS Department (formed in 1995 by combining three Departments: Veterinary Pathobiology, Pharmacology and Physiology, and Anatomy and Cell Biology) has a rich history of research to benefit man and animal species. Early research programs in the College focused on the pathogenesis of infectious diseases, endocrinology, physiology, and cancer research. The Retrovirus Research Program was an early research focus and was organized in the early 1970s. In 1989 OSU officially recognized and designated the Retrovirus Research Program as a university academic Center of Excellence. The Center for Retrovirus Research current membership includes 20 principal investigators at OSU, Children's Hospital Research Institute and Wright State University. The research interests of center members form a highly interdisciplinary network of collaboration for research initiatives including a National Cancer Institute Program Project Grant <http://www.vet.ohio-state.edu/retro.htm> .

Since the late 1980's, the College and, in particular, the Department has successfully recruited research intensive faculty, while continuing to renovate and expand research facilities suited to conduct quality sponsor supported research. These efforts have included the hiring of 13 faculty or research scientists in infectious disease or cancer research from 1986 to 2007, all of which have obtained funding from NIH (Table 2). Since 2003 based on the College Strategic Plan, VBS faculty members led successful efforts to develop the criteria for and supported the formation of two primary signature programs in *Infectious Disease* and *Comparative Oncology*. Both of these programs have been supported by hiring research-intensive faculty and programmatic support. The Comparative Oncology Program

Table 2. Summary of Recruitment to Veterinary Biosciences 1986 to 2007 (Research Focus and Funding Source)

1986	Dr. Thomas Rosol, (Cancer/Endocrinology, NCI, NCRR)
1988	Dr. James DeWille, (Cancer/Molecular Biology, NCI)
1989	Dr. Michael Oglesbee (Virology/Neuropathology, NINDS)
1990	Dr. Michael Lairmore (Virology/Cancer, NIAID and NCI)
1996	Dr. Kathleen Boris-Lawrie (Virology/Gene Therapy, NIAID and NCI)
1998	Dr. Patrick Green (Virology, NCI)
2003	Dr. Stefan Niewiesk (Virology/Mouse Pathobiology, NIAID, R01)
2003	Dr. Laura Rush (Cancer Genetics, NCI, K08)
2004	Dr. Mary Jo Burkhard (Retrovirology/Immunology, NIAID, R01 and K01)
2005	Dr. Ian Davis (Respiratory Physiology, NIH, K08)
2005	Dr. Prosper Boyaka (Immunology and Infectious Diseases, NIH, R01)
2006	Dr. Cheryl London (Cancer Immunology, NIH R01)
2007	Dr. Tracey Papenfuss (Immunology Infectious Disease, NIH, K01)

<http://www.vet.ohio-state.edu/comparativeOncology.htm> currently has approximately 25 faculty participants from the College and 2 participants from MedVet, a multi-specialty referral practice in the community. All three College departments are now represented in the program. In addition, staff members, professional students and graduate students regularly attend regular meetings, seminars, and participate in focused research projects. Founded in June 2004, the Infectious Disease Signature Program at the College has broad faculty participation across multiple disciplines including virology, microbiology, immunology, clinical medicine and epidemiology <http://www.vet.ohio-state.edu/957.htm>. They hold regular meetings, sponsor seminars, support student clubs, and have held 2 major symposium focused on mucosal immunology and antimicrobial resistance. Each of the symposia hosted internationally known leaders in these fields and was attended by over 150 participants.

Research awards, over the last five years (2002 - 2007) in the VBS Department total over \$38 million and indicate strong interdisciplinary research programs in the areas of oncology, microbiology, and immunology (Fig. 3 above).

The principal goal set in 2003 following strategic planning in the Department was to foster the career development of new and existing faculty members to build or enhance productive nationally recognized research programs. New faculty hires were expected to be capable of sustained extramural research funding in focus areas of research or reinforce strengths research areas compatible with existing Departmental faculty members or strategic interdisciplinary initiatives within the College or the University. Faculty hiring strategies are periodically reviewed by the Department Faculty Advisory Committee (FAC) to take

advantage of emerging areas that will compliment or extend existing research strengths. Particular areas of interest in 2003 were the recruitment and hiring of a faculty member to support the interdisciplinary genetically-engineered animal pathobiology program and animal genetics. This was felt to be an emerging area of research strength supported by the recent faculty hires, a developing NIH training grant in mouse pathobiology (funded in 2002 and renewed in 2007) and a mouse phenotyping service (incorporated as a shared resource by the OSU Comprehensive Cancer Center in 2003). Seven faculty members have been hired since 2002 to address strategic goals (all research intensive with greater than 75% time and effort devoted to research (Table 2 above). During this same time period 5 faculty members have retired and one has left for another position at a peer institution.

Current approved and ongoing faculty searches include positions in mouse pathology for an anatomic veterinary pathologists (regular tenure track or clinical track), and a regular clinical track anatomic veterinary pathologists to support education and service missions. The following proposals have been recently received by the Department FAC to consider and recommend for future faculty hires:

1. General and Reproductive Endocrinologist (regular tenure track): Faculty member with research qualifications and ability for sustained NIH funding in endocrinology and reproduction using molecular, cellular, developmental, genetic, and/or structural approaches. Contribute to graduate education and didactic teaching in endocrinology and endocrine aspects of reproduction in the professional core curriculum.(Petition recorded, Sept 2007)
2. HIV-1 molecular pathogenesis (regular tenure track): Faculty member with established research program and NIH funding to partner with CMIB, Center for Retrovirus Research, CVM infectious disease signature program, AIDS Clinical Trial Unit and other OSU programs to promote excellence and programmatic development in infectious disease. Contribute to graduate education and didactic teaching missions in graduate and professional arenas .(Petition recorded, Sept 2007)
3. Veterinary Clinical Pathologist (regular clinical track): board certified faculty member to replace our clinical instructor position with a clinical track faculty position. (Petition recorded, Sept 2007)
4. Two new anatomic veterinary pathologists to replace retiring faculty (regular tenure and clinical track): One proposed to have a major research appointment and minor teaching and service commitment; and the other to have a major teaching and service appointment in the instructional activity of anatomic veterinary pathologists in the professional curriculum and minor research commitment and function (adapted from 2004 petition.)

B. Sources and Levels of Support/Funding: The majority of research funds are obtained from the National Institutes of Health, while industrial support, subcontracts (principally NIH subcontracts), and private foundations contribute significantly to the Department's sources of funds (Fig. 4). These sources have not significantly changed over the past 5 years. Development has provided support for graduate student training and has been an increasing source of support since 2003 (see Graduate Studies Section).

The Department strategically seeks to expand its resources by leveraging faculty recruitments by partnerships in the College through strategic planning funds from indirect cost returns held centrally in the Dean's office and by linkage to other OSU department or programs. Funds provided by College administration (Dean's Office) since 2002 totals approximately \$1.5

million. This support has come in the form of \$869,400 in faculty start up funds, \$ 14,000 in signature program seminars, \$168,510 laboratory renovations, \$ 89,460 in research equipment purchases, \$ 58,000 in faculty bridge funds, \$264,315 in graduate fee support above graduate school allocation, and \$84,700 in faculty salary annual rate increases.

New faculty hiring initiatives will continue to be coupled to leveraging opportunities with OSU programmatic efforts such as the Provost Targeted Investment Program or with key partnering Centers such as the Center for Retrovirus Research and OSU Comprehensive Cancer Center. The Department seeks with each faculty member recruitment effort strategic investments from the Office of Academic Affairs (e.g., Faculty Hiring Assistance Program for women and under represented minorities) and the Office of Research (faculty with funded research programs). These efforts have been successful in all 7 faculty hires since 2003. Use of current or developing endowed funds (e.g., named Chairs or Professorships) administered from the Dean's Office that are aligned to missions in the VBS Department are envisioned as an unmet need with high potential to enhance future faculty recruitment plans. Additional sources of revenue to

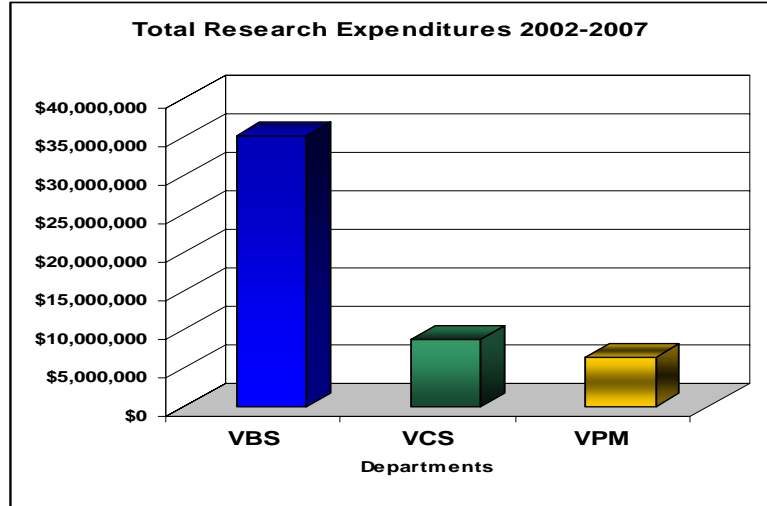


Figure 4. Comparison of Research Expenditures by Department

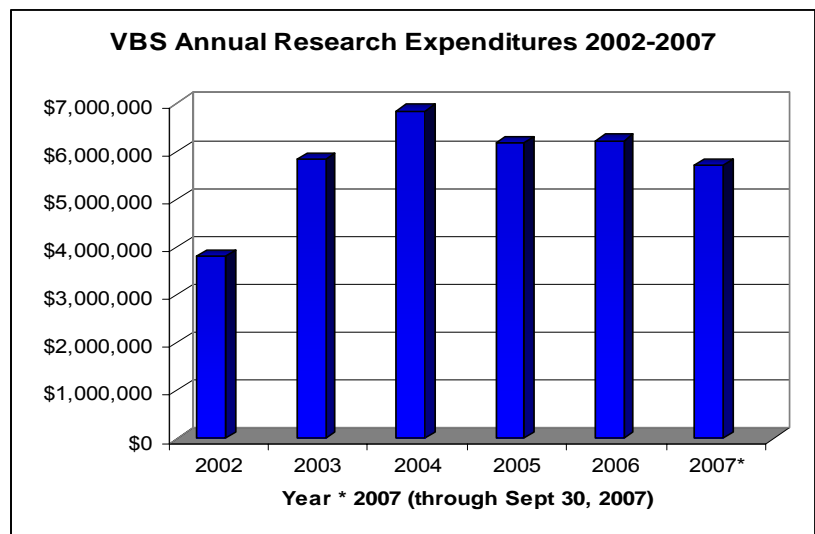


Figure 5. VBS Research Expenditures Past 5 Years.

support the research mission of the Department include release time, 40% of which comes into a department account, earnings accounts from services such as the histology core, and royalty funds from patents.

C. Impact of Research: Extramural grant expenditures for the College have increased by 9.3% to a total of \$12.7 million in calendar year 2006 compared to the previous year. The VBS accounts for the greatest amount of research funds over the past 5 years compared to the Departments of Clinical Sciences (VCS) and Preventive Medicine (VPM)(Fig. 5). The Department set a goal of \$6 million dollars during the strategic planning process in expenditures by the year 2007 (Supplement – VBS Strategic Plan 2003). This goal was achieved by 2004 and has been sustained through 2007 despite a highly competitive national environment for research funds. This sustained growth in research expenditures as been accomplished, in large part, due to the successful funding of an NCI Program Project Grant (the largest single sponsored grant in the history of the College) and strategic recruitment of research intensive faculty members (above sections). Additional measures of impact include faculty members who are recognized for their research accomplishments through scholar awards (documented in previous Faculty Section and in faculty biographical sketches in Supplement).

The OSU College of Veterinary Medicine ranks first among peer veterinary colleges in the nation with an average impact factor of 3.19, ranked by average citations per paper among the top 100 federally funded U.S. universities that published at least 100 papers in Thomson Scientific-indexed journals of veterinary medicine & animal health between 1999 and 2003. http://in-cites.com/research/2004/november_22_2004-1.html

Rank	University	Number of papers, 1999-2003	Citations per paper
1	Ohio State University	492	3.19
2	University of Wisconsin, Madison	385	2.82
3	University of Minnesota	449	2.78
4	Michigan State University	386	2.71
5	University of Kentucky	113	2.51

In the VBS Department among over 200 primary research publications and review articles published between 2002-2007 that were rated for citation impact, the average impact factor was 3.8 (median 4.0), with a range 0.6 to 15.8. Areas of highest activity in journals with recognized citation impact factors were microbiology (n=141), which contains the two significant subject areas of molecular virology (n=87) and bacteriology (n=54); followed by oncology (n=82) and immunology (n=35). Publications in the field of molecular virology contained manuscripts with the highest impact factors such as Nature Structural and Molecular Biology (12.19), and Blood (10.34), and reviews such as Microbiology and Molecular Biology Reviews (15.8) and the highest percentage of impact factors over 5. Publications in oncology had the greatest number of co-authors within the faculty suggesting a highly collaborative or interdisciplinary research focus. Examples of selected high quality

peer-reviewed publications authored by VBS faculty members are provided in Table 4. A complete list of publications is provided in the Supplement and in faculty member biographical sketches (Supplement).

Table 4. Selected Publications of VBS Faculty 2002-2007

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Toribio, R.E., Kohn, C.W., Leone, G.W., **Capen, C.C.**, and Rosol, T.J.: Molecular Cloning of Equine Calcitonin, Calcitonin Gene-Related Peptide-I, and Calcitonin Gene-Related Peptide-II. Molecular and Cellular Endocrinology 199, (2003): 119-128.

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Ye J, Silverman L, **Lairmore M**, and **Green P**. Human T-Cell Leukemia Virus Rex is Required for Viral Spread and Persistence in vivo but is Dispensable for Cellular Immortalization in vitro. Blood 102:3963-3969, 2003.

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IV. Cross-Disciplinary Activity: The Department has considerable cross disciplinary activities encompassing research, education, outreach and engagement, and service missions. These activities are detailed in individual sections, but summarized in the following sections. Many of the Department faculty members are jointly-appointed in the College of Medicine or College of Biological Sciences, members of the OSU Comprehensive Cancer Center or Davis Heart Lung Research Institute. Faculty members with active and funded research programs tend to belong to interdisciplinary research groups or are members of interdisciplinary graduate education programs in molecular, cellular and developmental biology, and biochemistry. Several faculty members have been or are currently in leadership positions in important programs or activities including: Dean of the College – T. Rosol, Associate Dean of Research – L. Mathes, OSU Comprehensive Cancer Center (Associate Director for Basic Sciences – M. Lairmore, Program Co-Director – P. Green, members of graduate studies committees for interdisciplinary graduate programs in biochemistry – C. Brooks, representatives in the OSU Senate – L. Olson and C. Brooks, co-leader of RNA interdisciplinary interest group – K. Boris-Lawrie, innovative OSU teaching programs to enhance the integration of technology in the classroom – J. Masty, N. Inpanbutr, Public Health Preparedness Steering Committee member – M. Lairmore, Center for Retrovirus Research Director – P. Green, leaders of College signature programs in infectious diseases or comparative oncology – Drs. Burkhard and Rush respectively, Director of College Summer Research Program for Veterinary Students – M. Lairmore and L. Mathes, Presidents Council for Women – N. Inpanbutr, and members of NIH or American Cancer Society Study Sections – Drs. M. Oglesbee, P. Green, K. Boris-Lawrie, MJ. Burkhard, Y. Lin, Y. Rikihisa, M. Lairmore, L. Mathes, J. Radin.

A. Level of Cross Disciplinary Activity: To illustrate the scope of cross disciplinary activities the follow section contains examples of faculty member's engagement in cross disciplinary activities.

Retrovirus Models of Lymphocyte Transformation and Disease (funded by NIH/NCI).

Dr. Lairmore leads an investigative team of Center for Retrovirus Research faculty awarded a \$9.8 million grant in 2003 from the National Cancer Institute to investigate retroviral models of cancer. This Program Project Grant (PPG) uses integrated retrovirus models to understand basic cellular mechanisms of cancer. The members of this PPG application have an extensive record of joint research and well developed interactions that serve as a foundation of the PPG. This collaboration was initiated when Dr. Lairmore joined Dr. Mathes (Core B Director) within the nurturing research environment at OSU in 1990. The research group expanded further as Drs. Boris-Lawrie (Principal Investigator, PI, Project 3) and Green (PI, Project 2) joined OSU in 1996 and 1998 respectively. The group has conducted weekly joint retrovirus laboratory meetings since 1998 <http://www.vet.ohio-state.edu/retro.htm> and research projects (1998 – Present). In 1999, Dr. Rosol (Current PI of Project 4) initiated with Drs. Green and Lairmore highly productive and interdisciplinary studies of humoral hypercalcemia of malignancy using a mouse model of HTLV-1-associated lymphoma. From these interactions and a series of meetings evolved the PPG plans in 1999, developed jointly by Drs. Green, Boris-Lawrie, Mathes, Rosol, and Lairmore, thereby promoting distinctive interdisciplinary research efforts among the group. Dr. Stefan Niewiesk (Proposed Director of Animal Core C) was recruited in 2003 to the Department. He is an established investigator, certified laboratory animal veterinarian and microbiologist.

Dr. Lairmore directs a **NCRR T-32 Institutional Training Grant: Animal Models of Human Disease: Mouse Pathobiology** that has recently been renewed. This grant provides an outstanding environment for veterinarians (DVM or VMD) and DVM/PhDs to attain specific research and conceptual skills to develop and effectively utilize mouse models of human disease. The training program has been highly successful in establishing the training program exceeding all goals of the original proposed training grant plan. Despite having a training position cut in 2005 and 2006 (reducing the maximal number of trainees from 6 to 5 positions) the program has enrolled 11 DVMs into the program. This was accomplished through a well established recruitment program, leverage of University resources, and trainee's success in obtaining NIH Career Development Awards (K Awards). Of the 11 trainees supported over the first 4.5 years of the program, two were awarded NIH K Awards (K08 and K01), two have matriculated and are employed in biomedical or academic positions, and 9 are completing requirements for their PhD degrees of which 5 currently are funded by the T-32 training grant. We have integrated new training faculty that have expanded our training faculty members as a diverse group of biomedical scientists with extensive training records from across the University.

Dr. Thomas Rosol's NIH funded develops mouse models of human cancer to investigate cancer-associated hypercalcemia and bone metastasis. Dr. Rosol has multiple important collaborations with OSU cancer center members including serving as **Animal Core Director for a P01** granted regarding the microenvironment and stromal interactions in breast cancer. Dr. Rosol has worked collaboratively with Dr. Michael Knopp (Chair of Radiology, College of Medicine) on contrast-enhanced MRI imaging of the prostate gland in beagles and to identify cancer molecular targets in mouse models of human cancer. This

collaboration led to the College working with the Department of Radiology on a State of Ohio funded project to build a **new MRI facility** for the College

<http://www.radiology.osu.edu/wci/index.htm>.

Dr. Charles Capen is an Institute of Medicine member and Distinguished University Professor. He has collaborates extensively with Dr. Sissy Jhiang in the **Department of Physiology in the College of Medicine**. Two lines of transgenic mice have been developed differing in the relative copy number of *ret/PTC₁*. All *ret/PTC₁* mice developed thyroid carcinomas, but tumors in *p53 -/-* mice were more anaplastic, larger in diameter, more invasive, and had a higher mitotic index than tumors in *p53 +/+* and *p53 +/-* mice. DVM graduate students such as Dr. Katie Knostman have benefited from this interaction and developed Ph.D. thesis projects using this model system. Dr. Capen has extensively collaborated with Dr. Rosol in research involving a number of DVM graduate students seeking to clarify the physiologic role for PTHrP in bone, skin, mammary gland, and prostate.

Dr. Ching-Shih Chen's a graduate faculty member of the VBS Department and Professor in the **College of Pharmacy** is an advisor of Dr. Aaron Sargeant, a DVM, PhD candidate in the VBS Department veterinary pathology training program. Dr. Sargeant is a recipient of an **American College of Veterinary Pathologists Coalition Fellowship** in toxicologic pathology sponsored by Schering Plough. His training represents a clear example of the VBS graduate training program's ability to incorporate high quality research laboratory opportunities for the benefit of trainees. Dr. Chen's laboratory designed a series of novel small-molecule agents that cause apoptosis by attacking different molecular defects in tumor cells. These novel agents mediate antiproliferative effects through mechanisms distinct from that of conventional chemotherapeutic regimens to provide a rational approach for molecular targeted cancer therapy. These compounds are now being utilized in Dr. Lairmore's laboratory to test in HTLV-1 associate lymphoma mouse models.

Dr. E. Antonio "Nino" Chiocca, joined OSU from the Massachusetts General Hospital and Harvard Medical School in March 2005 as chair of the new department of neurological surgery and holder of the Dardinger Family Endowed Chair in Oncological Neurosurgery. He co-directs the **Viral Oncogenesis Scientific Program** of the OSU Comprehensive Cancer Center with Dr. Patrick Green of the VBS Department. Dr. Chiocca is a leading investigator in the use of gene therapies for brain tumors and other central nervous system disorders. His research interests range from engineering more efficient "tumor-killing" genes and defining more selective viruses that could be used to deliver therapeutics directly to tumors. He also collaborates with Dr. Oglesbee in the VBS Department in characterizing brain tumor models.

Dr. Gustavo Leone's in the **Department of Molecular Genetics** is a graduate faculty member in the VBS Department. He studies the role of the Rb/E2F pathway in the control of cell growth and cell death utilizing both in vitro and in vivo models. He is an active collaborator with Drs. Rosol and Ostrowski. Ongoing studies seek to define mechanism of E2F action in the control of cellular proliferation and apoptosis using homologous recombination techniques in mice including conditional knock-out mouse models. Dr. Leone has developed several models of breast cancer using tissue and cell-specific deletion of genes in the mammary glands to investigate mechanisms of cancer progression. These studies have focused on the very interesting interactions taking place between the mammary stroma and the cancer epithelial cell that dictates tumor progression. He has formed a group with investigators from multiple departments having similar interests and with Dr. Rosol and Ostrowski obtained **NIH P01** funding to understand the role played by the cellular

microenvironment in the development of tumors. The animal core for this P01 is directed by Dr. Rosol and collaborates by using the histology laboratory in the VBS Department.

Dr. Larry Schlesinger coordinates the **Center for Microbial Interface Biology (CMIB) in the College of Medicine**. Dr. Lairmore, Dr. Schlesinger and a group of investigators were awarded a Provost Initiated Targeted Investment in Public Health Preparedness in Infectious Diseases. He is a graduate faculty member in the Department of Veterinary Biosciences and advises Dr. Tracey Carlson (DVM) a T-32 trainee. He serves on the graduate committees of students for a number of VBS faculty members. Similarly, Dr. Joanne Turner of the CMIB program is a graduate faculty member in the VBS Department and advises Dr. Gillian Beamer (DVM) a trainee who recently was awarded an NIH K08 award and was funded previously by Dr. Lairmore's NCCR T-32 Mouse Pathobiology Training Grant.

The **Gnotobiotic Life Laboratory** (headed by Dr. Steven Krakowka) is located in Rooms 110 and 238 of Goss Laboratory. Currently, the laboratory provides logistical support for gnotobiotic animal studies in 3 separate areas of investigation. The interest in inherited immunodeficiency disorders of dogs, particularly X-SCID defects in beagle dogs was heightened by reports that in at least two young patients with this defect, lymphoreticular malignancies developed following marrow transplantation with stem cells transfected with retrovirus vectors. X-SCID dogs are available through collaborative studies with Dr. Peter Felsberg, **University of Pennsylvania**. The Gnotobiotic Life Laboratory is also essential for developing models of *Helicobacter pylori*, a gram negative human gastric pathogen of prime importance in clinical gastritis, ulcer disease and gastric carcinoma. This is the only model wherein an out-bred species (swine) respond uniformly to prophylactic vaccinations against this infection. In addition, the laboratory has an ongoing effort to understand the pathogenesis of porcine circovirus type 2 (PCV-2) recently funded by an NIH R21 and R01 grant. The containment and unique ability to test the pathogenicity of new agents, such as PCV-2, are a critical component of the Department's and College's infrastructure in infectious disease research.

B. New Projects Related to Cross Disciplinary Activities: Dr. Lairmore led efforts to respond with other college leaders to respond to a Provost Targeted Investment Program (TIE) in 2006. Recent threats of disease pandemics, bioterrorism, food-borne illnesses and natural disasters underscore the importance of public health preparedness for the United States. The **Public Health Preparedness for Infectious Diseases (PHPID)** TIE was formed to weave together high stature **programs across six colleges** (Veterinary Medicine, Medicine, Public Health, Biological Sciences, Food, Agricultural, and Environmental Sciences, and Pharmacy) to form a unique, comprehensive, and strategic program that will yield high impact discoveries and ultimately improve the human condition. Department Chairs from the VBS Department (Dr. Lairmore) and VPM Department (Drs. Kent Hoblet and William Saville) helped form the concepts and helped write the proposal for this initiative as a natural extension of the Infectious Diseases Signature Program and the Center for Retrovirus Research from the VBS Department, and an emphasis on public health in the VPM Department. The PHPID program received a commitment of \$4.9 million in continuing funds and cash from the OSU Office of Academic Affairs following a campus-wide competition. New faculty hires, a new graduate fellowship program, and a pilot research grant program have been initiated since funding began in 2006. In another targeted effort, Dr. Laura Rush in the VBS Department is a key collaborator with the **College of Medicine** (Dr. Carlo Croce)

on another Provost supported investment related to microRNA and Cancer, which will bring approximately \$100,000 to the Comparative Oncology Signature Program.

Dr. Stefan Niewiesk was recruited in 2003 to the VBS Department. He is certified in laboratory animal medicine and microbiology. Dr. Niewiesk worked with Dr. Valerie Bergdall Director of the Animal Research Core and Dr. Judy Hickman-Davis of the **University Laboratory Animal Program** to reestablish a laboratory animal residency training program and a new elective course in laboratory animal medicine for veterinary students. In addition these same faculty members provide veterinarians funded on the Mouse Pathobiology T-32 training in the care, use, and techniques of laboratory animals. The one month rotation through Laboratory Animal Medicine Service and Quality Assurance Laboratory in the Veterinary Hospital Laboratory Animal Facility allows trainees to be gain knowledge and skills in rodent handling, common procedures e.g., venipuncture, procedures for handling immunodeficient mice, requirements for housing and maintaining rodent colonies, etc. Dr. Niewiesk helps coordinate interactions with trainees, develop necropsy and diagnostic procedures involving trainees, and coordinate laboratory animal courses involving trainees and the laboratory animal medicine residency program. He has an active research program with collaborative studies with Drs. Michael Oglesbee and Ian Davis based, in part, on their mutual interest in paramyxoviruses. Research interests of the group are based on the clinical relevance of measles virus infection. They investigate immune suppression caused by measles virus using the cotton rat model. Dr. Niewiesk co-directs the Animal Core of Dr. Lairmore's program project grant with Dr. Rosol.

Dr. Laura Rush, DVM, PhD was hired by the Department in July of 2003. Her research funded by an NIH K08 award is focused on epigenetic alterations of the genome that can play a major role in tumorigenesis. Since October of 2003, she also has assumed a leadership role in developing a Comparative Oncology Signature Program in the College described in the Supplement. Her NIH funded research studies epigenetic alterations, including DNA cytosine methylation and chromatin remodeling, that result in aberrant transcription of the affected genes through heritable DNA and chromatin modifications. She is a co-investigator with Dr. Carlo Croce of the College of Medicine on a recently funded Provost-initiative to understand the role of microRNA in canine cancer. She also is leading a College-wide effort to develop a **tissue bank in the Veterinary Teaching Hospital**. This was recently funded by a grant from the National Cancer Institute, one of only three regional tissue banks devoted to canine cancer.

Dr. Mary Jo Burkhard, DVM, PhD was hired as Assistant Professor in the Department in February 1, 2004. Her laboratory investigates the vaginal transmission and immunopathogenesis of feline immunodeficiency virus (FIV) infection as a model for HIV sexual transmission. Her research is focused on fundamental questions of maternal-to-fetal transmission of retroviruses. Since joining the faculty, Dr. Burkhard has taken a leadership role in organized the Infectious Disease Signature Program for the College. She collaborates with Dr. Jesse Kwiek in the **College of Medicine, CMIB program**. They were recently awarded a pilot grant from the Provost's funded Public Preparedness in Infectious Diseases.

Dr. Prosper Boyaka joined the VBS Department in April of 2006. His research interests focus on the regulation of mucosal immunity and inflammation. He has taken a leadership role in the **Infectious Disease Signature Program in the College**. Dr. Ian Davis and Dr. Boyaka started an Immunology Journal Club to focus critical reviews of the literature with graduate students and interested faculty. Dr. Boyaka's group studies the interactions

between mucosal immune cells to better understand molecular events that control the initiation and the Th1 or Th2 nature of immune responses in mucosal sites. His research provides students unique training opportunities in immunology with emphasis on mucosal tissues of the gastrointestinal, the respiratory and the genito-urinary tracts, as well as innate and adaptive immune responses to infectious diseases.

Dr. Cheryl London was recruited in January of 2006 through an initiative developed from the **Comparative Oncology Signature Program** and funded by strategic funds set aside from indirect cost returns to the College. Dr. London's research involves the role of c-Kit mutations and their role in cancer. She uses mouse and dog models to investigate the role of the oncogene in cancer. Recent studies with various experimental kinase inhibitors both *in vitro* and *in vivo* suggest that inhibition of Kit signaling may be of significant benefit to patients with these malignancies. Dr. London has established extensive faculty and trainee interactions including collaborative studies with Drs. Rush who jointed lead the Comparative Oncology Signature Program for the College. The mission of this program is to promote interdisciplinary collaborative research and educate professional and graduate students in the pathogenesis of cancer in all species, to optimized therapeutic modalities and improved quality of life for oncology patients. She has been named as Director of the Clinical Trials Office and has a 25% salaried appointment in the VCS Department of the College and is actively involved in developing clinical trials for new anti-cancer drugs.

Dr. Nong Inpanbutr developed a unique **cross disciplinary educational project** for outreach and engagement of middle school students. She led the development of an interactive website entitled, "Do you want to be a Vet?" <http://vet.osu.edu/BeAVet> . This project is described in the "Outreach and Engagement" section of this Self Study Report.

C. Obstacles/Challenges: A number of obstacles preclude further advancement of more interdisciplinary activities. These include a limited operations budget for the Department. The College has provided \$310,000 annually for basic operations of the Department since 2002. This amount has not increased by the rate of inflation and remains at \$310,000 in 2007. This is in the face of rising costs of repairs and maintenance of existing infrastructure, which is particularly evident in Goss Laboratory that was built in 1960. For this reason the building has frequent and major building problems that are charged to the Department budget. This coupled with an increase need to support expensive research programs results in frequent requests to the Dean for more support and the use of cash from earnings accounts.

In 2002 the University converted to a distributed budget model. This system provides indirect cost returns (after central taxes are taken out) to be returned to the College. These funds have been successfully used for strategic investment at the discretion of the Dean. The Department has benefited from these investments, however the continued source of these funds is not guaranteed or under the control of the VBS Department, which generates the majority of the pool of funds. Significant concerns involve the source of funds for graduate student tuition and fees. In 2003, the College was provided funds in proportion to the graduate student enrollment. The VBS portion of these funds (~\$310,000) was supplemented yearly by the cost of graduate student tuition and fee increases (~9% annually) by Dean Hoffsis and Interim Dean Hubbell. This practice was discontinued in 2005 when Dean Rosol was appointed. Thus, the pool has effectively diminished as graduate tuition and fees continue to rise in 2007 (Fig. 6). The Department has responded by asking investigators to put tuition and fees in grant budgets, shifting costs of all non-regular faculty

to other sources, obtain training grants that pay tuition and fees, obtain development gifts for graduate stipends and tuition and fees, etc. In the current NIH budget climate this means investigators are left with fewer funds to perform the research and in some cases have shifted priorities away from graduate student hires to technicians or post doctoral fellows. Therefore, the long term outcomes of the current budget model are uncertain and have the potential to negatively affect the growth of interdisciplinary programs involving graduate students. Equally uncertain is the influence of the budget model on educational initiatives and course development, as student hours are now linked to marginal cost shares back to the College.

Significant demands for high quality research space have accompanied the expanding research enterprise. The result is more pressure on new space e.g., VMAB building. To continue expansion of interdisciplinary research the need for new laboratory space will be required in parallel to plans to build clinical facilities.

The Department and College must continue to work to promote a culture of understanding and value of the essential contribution of trainee, staff and non-tenure track appointees to research productivity and educational excellence. Quality of Life programs that have been developed at the College and Department levels are encouraging, but must continue to evolve and respond to the demands placed on the faculty, staff, and students.

A potential concern is the effect of a combined graduate program that leverages College resources while attempting to meet the demands for high quality graduate education from the University that may not mesh with a graduate program in the context to a health sciences college. For example, the OSU Graduate School prior to 2007 did not recognize GRE scores that were obtained 5 years prior, thus effectively eliminating our high quality DVM graduate students applying to our PhD program from OSU fellowship opportunities and having their scores count towards statistics to evaluate the quality of our program. Additional obstacles include human resource classifications of DVMs who are appointed on NIH training grants. Currently the University classifies these PhD students as neither staff or students, resulting in additional “self employment” tax burdens. This has a negative impact on DVMs who carry a high debt load coming back to graduate school.

The rising costs to participate in OSU Interdisciplinary Graduate Programs have outpaced resources in the Department and require supplementation by the College. This has the potential negative effect of the College restricting scarce resources for a more uniform program that may not promote interdisciplinary interactions of the existing programs. Thus

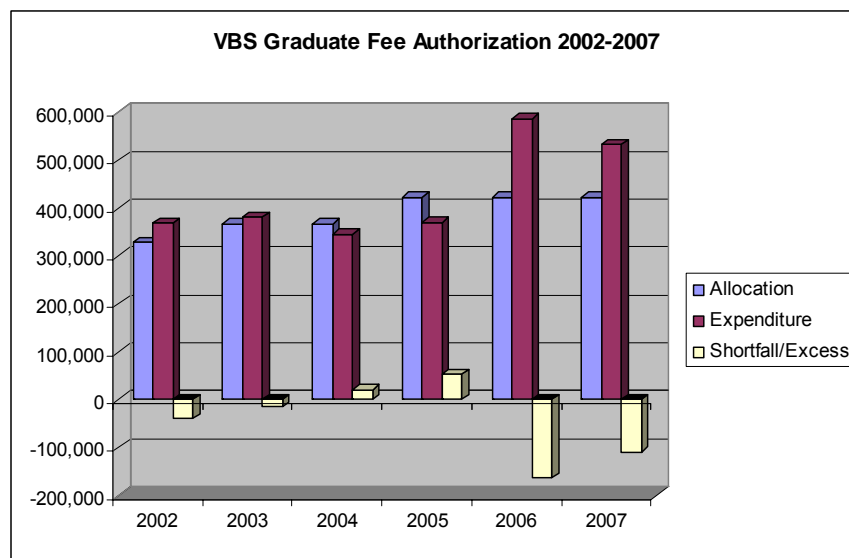


Figure 6. Tuition and Fee Allocation versus Expenditures Past 5 Years

the Department will need to continue to work with OSU administration to balance support of Integrated Graduate Programs in line with the goal of the academic plan “to be among the world’s great universities”

The Department has responded to these uncertainties by developing partnerships in cost shares for equipment, faculty start packages, etc. A business manager position was created to streamline fiscal operations and seek cost savings in the operations of the Department. A blanket service contract agreement has been instituted to reduce excessive inflationary costs associated with multiple vendors. Staff positions have been reduced through attrition, but these have been offset by an increased compliance environment that requires an ever increasing use of staff time and effort. The result is a staff that is at times stress to meet the demands of multiple audits, information security requirements, etc. Earnings accounts have been creating for services that generate sufficient income to offset service contract costs and in some cases contribute to staff bonuses and equipment purchases. The Department has been successful in seeking gifts from grateful alumni, friends of the Department, and pharmaceutical companies for specific programs to train veterinary pathologists and for veterinary student summer research projects, but these may not have limited ability to negate other fiscal challenges as listed above.

V. Educational Programs

A. Strategies to Accomplish Educational Excellence: A primary education mission of the Department is to organize and teach all basic and selected applied and clinical veterinary medical sciences in the professional curriculum. Equally important is the mission to educate graduate students by providing experienced graduate advisors, state-of-the-art laboratory facilities, and programs for graduate education and specialty board preparation. The Department in 1996 developed a strategic plan, which was revised in 2002 in consultation with the faculty, staff, and students to address short and long-term needs of the Department and to facilitate the accomplishments of commonly agreed upon goals in the areas of education. The collective educational goals addressed in the strategic plan were categorized into 6 areas: 1) professional education, 2) graduate education, 3) medical specialty education, 4) incentives and rewards, 5) physical facilities, teaching equipment, and policies, and 6) faculty status/opportunities for future growth. To promote the accomplishment of these goals, the Department Chairperson organized and charged an *Excellence in Education Committee* to implement the Department’s Strategic Plan for Education and aid in faculty development. The committee is made up teaching team leaders from the Department who elect a faculty chairperson (currently Dr. Lynne Olson) and includes input from key staff or student leaders (e.g., VBS Graduate Student Association President). The committee serves to implement and monitor the progress of the Department's education strategic plan. These activities have included development of education forums to discuss peer review (in collaboration with the OSU Faculty and TA Development Office, exchange of course materials between faculty, development of teaching incentive and reward plans, website development related to education, etc. The committee meets on a regular basis to discuss and prioritize the education initiatives of the strategic plan. The committee has developed a list of projects to approach these goals and has appointed faculty, staff, or students to help them in the execution of the plan. The committee has lead efforts to improve the environment for students by recommending changes in furniture to accommodate note taking

and creation of rewards and criteria for best practices in teaching. A website was created by the committee that provided a teaching forum and links to educational resources <http://www.vet.ohio-state.edu/1222.htm>.

Excellence in teaching begins with initial hiring practices in the Department with inclusion of questions on the feedback forms faculty provided to the search committees regarding teaching potential. All faculty applicants are asked for a philosophy of teaching statement and documentation of teaching in applications for the faculty positions. Teaching performances are evaluated by the Chairman in conjunction with the Educational Resource Offices of the College following teaching assignments and during annual reviews of faculty. Faculty members are assigned teaching duties based on their expertise and demonstrated skill in the classroom. Examples of significant accomplishments that are considered of high merit in teaching include excellent student- and peer-evaluations of teaching, a scholarly publication record, maintaining an active and productive program that attracts and supports outstanding graduate students and postdoctoral fellows; awards or honors that recognize excellence in teaching, leadership role in national professional organizations or in committees of University, College, and Departmental governance, and leadership roles in the development of new innovative approaches to teaching.

B. Excellence in Teaching: The VBS Departmental Faculty has been highly recognized for teaching excellence awards (see Faculty Section for details). In summary, 11 Departmental faculty members have been awarded the *Carl J Norden Distinguished Teaching Award*. The *Dean's Award for Creativity in Teaching* has been awarded to 3 faculty members in the Department. The *Charles C. Capen Teaching Excellence Award* has been awarded to 11 faculty members in the Department. As a measure of outstanding teaching, 3 faculty members were awarded the *OSU Alumni Award for Distinguished Teaching*. In 2006, Dr. Steve Weisbrode received the *C.L. Davis Foundation's Harold Casey Award for Teaching Excellence* in veterinary pathology and Dr. Jerry Masty was recognized with *Unity Award*, which recognizes individuals for going out of their way to help students with disabilities to overcome challenges. Collectively, these awards indicated a strong faculty commitment to quality education and sustained excellence in their desire to serve student needs.

C. Examples of Departmental Innovations in Education: Our faculty seeks to improve their courses through a variety of innovations and technical advances. They are focused on preparing veterinary students to be competitive in a world of information technology with an overarching goal to be self-directed and life-long learners. Thus, veterinary students are exposed to early in their veterinary medical education program setting the tone for their subsequent educational experiences in our College. The following examples provide a few examples of these innovations. The VBS faculty was some of the first in the College to incorporate problem based learning concepts. A leader in this area was Dr. Inpanbutr, recipient of the Dean's Award for Creativity in Teaching in 2002, who introduced case studies in her courses through WEB CT[®] and provided leadership to extend the use of this innovation to other courses. WebCT and WebVet course materials are now commonly offered throughout our departmental courses and the veterinary professional curriculum (e.g., Stradley VM609 Digestive System; Lairmore VBS715 Applied Virology, Oglesbee and Lairmore VM550.02 Concepts in Virology, Gerkin VM640 Toxicology)

Dr. Brooks has taken the challenge of OSU President Karen Holbrook to discuss

modern research methods to OSU freshman students and excite their interest in a research career. He is doing so through a new and developing undergraduate freshman seminar (College of Arts and Sciences Freshman Seminar 137) in a program organized through the College of the Arts and Sciences.

Dr. Wellman is an example of one of our faculty that has been actively involved in bringing new ideas to her courses. She has developed a problem-based curriculum based on clinical cases for VME 693 Clinical Hematology Course (Wellman) - this new elective course includes veterinary residents/graduate students from the Department of Clinical Sciences and our Department. In VME 618 Hemic-Lymphatic System she has added weekly hematology case discussions which were very well-received by the students. She also initiated the use of WebCT for 9 hematology cases and quizzes and revised lectures for computer presentation and in VBS 693 started a small group session for hematology case discussion (*students requested this course*). In VP812 Mechanisms of Disease Dr. Wellman has develop curriculum for 8 hours of seminar on the hemic-lymphatic system, which are linked to weekly cytology rounds with students, interns, residents, and clinicians to discuss clinical cases. Finally, Dr. Wellman, Radin, and Burkhard have created "mock board exams" for clinical pathology residents/graduate students to prepare them for certification by the American College of Veterinary Clinical Pathologists.

Drs. Wellman, Olson, Masty, and Johnson (VCS) in the summer of 2007 wrote a successful grant application to develop a course focused on the interdisciplinary specialization of teaching in a college of veterinary medicine. The proposed course will meet the requirements of the Graduate Interdisciplinary Specialization in College and University Teaching by creating a formal course devoted to teaching in the multiple curricular facets of veterinary medicine. It is being developed by a multi-disciplinary team of faculty who share a common interest in improving teaching within the college and who bring complimentary teaching skills to the effort. The course is expected to serve the needs of three separate and distinct graduate programs.

An *OSU Teaching Enhancement Program Fellowship* was awarded to Dr. Masty for a project entitled "Can You "Mooove" the Student to Independently Learn Anatomy Using a Plastic Cow?" This project compares student performance and attitude toward anatomic study in the traditional laboratory setting with a programmed self-study format. This was extended through the OSU Teaching Enhancement Program (OSTEP), which is designed to bring faculty across the University together to explore multiple and varied facets of teaching. In total 3 grants have been awarded to Dr. Jerry Masty enabled development and continued use of a plastination laboratory within the College and in anatomy labs within the medical school. The novel process of plastination turns anatomic specimens into durable, lifelike and odorless specimens for student learning and reduces the needed for animal cadavers. These included funded collaborative projects with the Columbus Zoo.

Dr. Jerry Masty is also a founding member of the OSU Association for the Scholarship of Teaching (TOAST). The Association was born from a small group of faculty who first met to support their own efforts in the practice of the scholarship of teaching. TOAST is now a University-wide community of interdisciplinary faculty supported by the office Faculty and TA development (FTAD) and the Office of Academic Affairs. Each quarter TOAST sponsors a presentation of an OSU instructor's scholarly study of their own teaching, a seminar on tools for educational research, and a monthly breakfast meeting to discuss timely topics in teaching at OSU. A proposal from the founders of TOAST was chosen by the Carnegie

Academy for the Scholarship of Teaching and Learning (CASTL) to participate in a program to improve undergraduate and graduate education. The program is a three-year partnership between Carnegie and universities with a strong commitment to the examination of teaching and learning. Based on the strength of the proposal, the TOAST founders group was selected as the lead institution for the CASTL's program on "Building Scholarly Campus Communities" to support the scholarship of teaching. Participating Universities are Dartmouth College, Kwantlen University College, Queen's University, Ryerson University, Southeast Missouri University, and the University of Glasgow, Scotland. OSU hosted the first international meeting of this Carnegie Cluster in May 2007.

The OSU Graduate School has recognized the departmental graduate program by awarding the Department (Dr. Lairmore and Olson, PIs) two separate Program of Enhancement of Graduate Education (PEGS) award in 1998-99 and 2000-2001, respectively. The PEGS funds (~\$41,000 total) were used to fund graduate student stipends, assist travel to scientific meetings, and enhanced recruitment efforts.

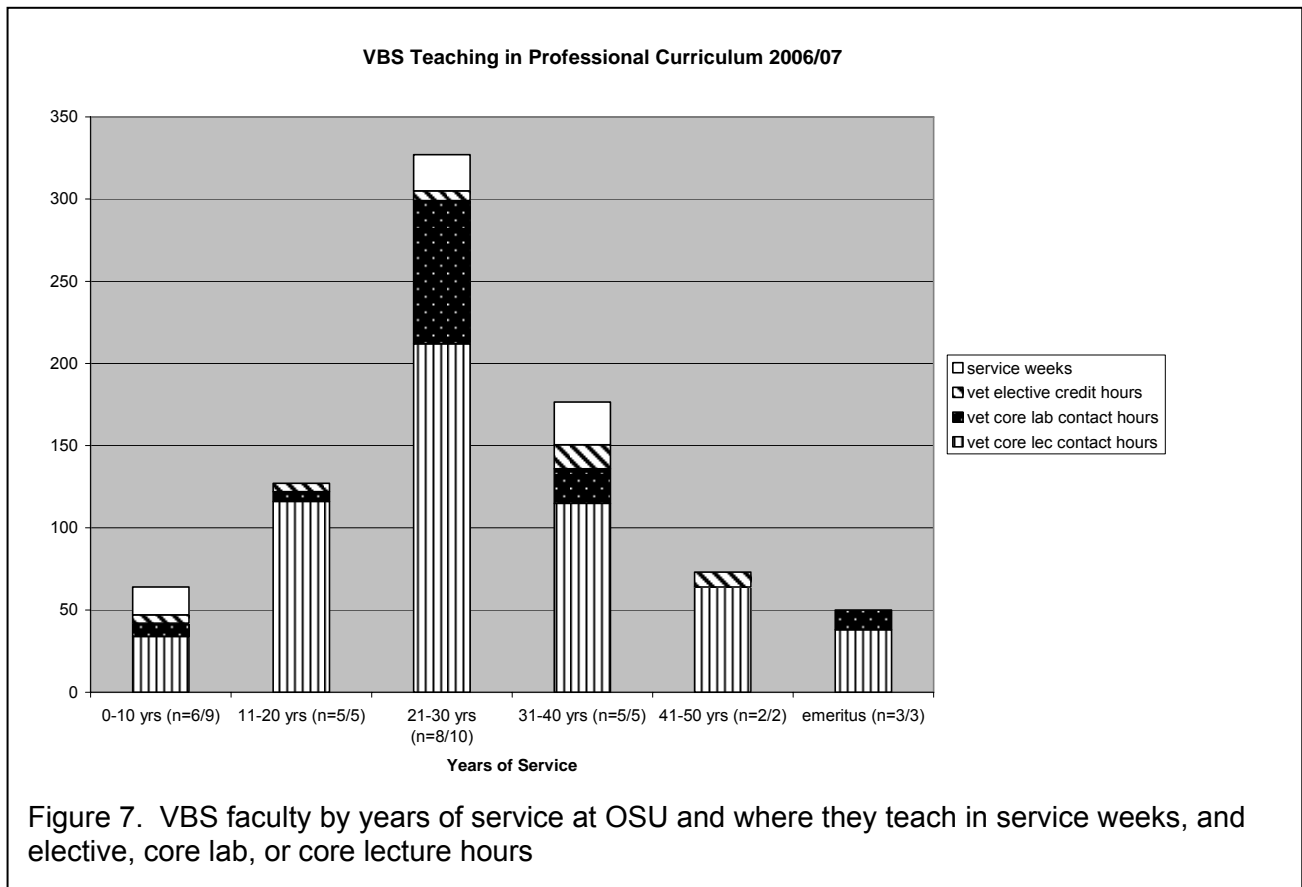
Dr. Inpanbutr in collaboration with other faculty members was awarded a grant through the *OSU Alumni Society* for their project "Web Base Program Development of Selected Surgical Procedures: Anatomy and Complete Illustrated Description of Anatomically-Challenging Procedures". The specific goal is to develop a Web Base audiovisual program with video stream media detailing surgical approaches/ anatomical structures in challenging surgeries. The long-term goal is to make these programs an Online Continuing Education Course for practicing veterinarians nationally and internationally. She also received a faculty collaboration grant from the *Technology Enhanced Learning and Research (TELR) Learning Technologies Institute (LTI)* established at OSU to develop faculty development and training programs associated with technology enhanced learning (<http://telr.ohio-state.edu/liti/>). Dr. Inpanbutr's team was one of only 7 teams across campus to be funded by Institute in 2003. These programs are also designed to integrate learning of medical terminology with studies of anatomical structures. Dr. Inpanbutr has also been awarded an *IAMS Company Visiting Scholarship* to Cornell University, to participate in a Problem Based Learning (PBL) Teaching Program in 1999. She was the first recipient of this award selected from veterinary schools across the nation. She has acquired experience in the PBL teaching technique and recognizes the importance of self-directed learning skills, implementing this technique in her teaching program to the current status (see innovations above). Two grants from the *OSU Veterinary Alumni Association* enabled the purchase of computer stations, a camera, and internet access in the veterinary anatomy lab. These upgrades allowed anatomy instructors to demonstrate anatomical structure of prosection specimens on television monitors installed in the laboratory. This allows the instructors to explain difficult subjects/structures by video presentation to the whole class while the dissection is in progress in the laboratory.

Dr. Stefan Niewiesk was hired through a grant from the *OSU Academic Enrichment Program* via a university-wide competition. He has establishing new courses for veterinary studies in laboratory animal medicine and helped reestablish the laboratory animal residency training program with members of OSU Laboratory Animal Resources. He has been instrumental in raising the awareness of laboratory animal training and has assumed a leadership role in the curriculum related to animal care and use.

D. Student Learning

Overview of the Professional Education (DVM) Program: The College of Veterinary Medicine professional education program is a 4 year (195 core credit hour/32 elective credit hour) program leading to the Doctorate of Veterinary Medicine degree. Each class is approximately 140 students, for a total student body of approximately 460. The core program of the first two academic years is largely pre-clinical courses, the third academic year is largely core techniques/skills courses and elective medicine and surgery courses, and the fourth calendar year is clinical service rotations. Core courses (signified with VM course numbers) are the responsibility of the college faculty as a whole, whereas elective courses are offered through the college departments individually and therefore signified with departmental course numbers (VBS, VCS, and VPM). The largely “lock-step” curriculum that is overseen by an accrediting body (American Veterinary Medical Association) creates regular, on-going, and discipline-based teaching requirements for college faculty that must be delivered to a class of 140.

Faculty members in the Department lead College pre-clinical instruction during the first two years of the 4 year curriculum. The goal of the pre-clinical core courses are to assure that all students have adequate background in the pre-clinical science disciplines, to provide a medical context for the pre-clinical information, and to extend the disciplinary



foundation knowledge required for continued success in the professional curriculum. In addition, several faculty members with clinical expertise provide both core and elective clinical experiences in the 4th year curriculum, which links their clinical service obligations to

professional education. VBS faculty may also choose to offer elective courses in their area of expertise for professional students that provide credit towards the professional degree. These courses, which range from advanced anatomy courses to clinical laboratory experiences, may also be approved for graduate credit and therefore be accessible to students who are not pursuing the DVM degree.

Table 5. VBS Faculty Role as Teaching Team Leaders

Course #	Title	VBS Team Leader	VBS / Total Faculty Teaching Course	Credit Hr
VM 520	Topographic Anatomy K-9	Inpanbutr	2 of 7	5
VM 530	Microscopic & Develop Anatomy I	Weisbrode	7 of 8	5
VM 540	Structure & Function of Cells	DeWille	all	5
VM 521	Topographic Anatomy Equine	Masty	all	4
VM 531	Microscopic & Develop Anatomy II	Weisbrode	7 of 8	4
VM 550.01	Comparative Biology of Disease I	Krakowka	all	5
VM 550.02	Comparative Biology of Disease II	Krakowka	6 of 10	6
VM 522	Topographic Anatomy Food Animal	Masty	3 of 4	4
VM 561	Pharmacology I	Strauch	1 of 2	3
VM 603	Neurobiology	Masty *	3 of 5	6
VM 604	Endocrine System	Capen	2 of 4	5
VM 600	Cardiovascular System	Non VBS	1 of 6	6
VM 601	Respiratory System	Olson	3 of 11	5
VM 618	Hemic-Lymphatic System	Wellman	6 of 7	5
VM 602	Urinary System	Non VBS	3 of 9	5
VM 607	Musculo-skeletal System	Weisbrode ~	2 of 15	6
VM 609	Digestive System	Non VBS	1 of 12	6
VM 605	Reproductive System	Non VBS	2 of 4	5
VM 606	Integument System	Non VBS	1 of 8	5
VM 608	Avian/Non-mammalian	Non VBS	2 of 10	2
VM 700.22	Oncology	Non VBS	1 of 2?	2
VM 700.14	Applied Path	Stromberg	all	3
			Total Credit Hours	102

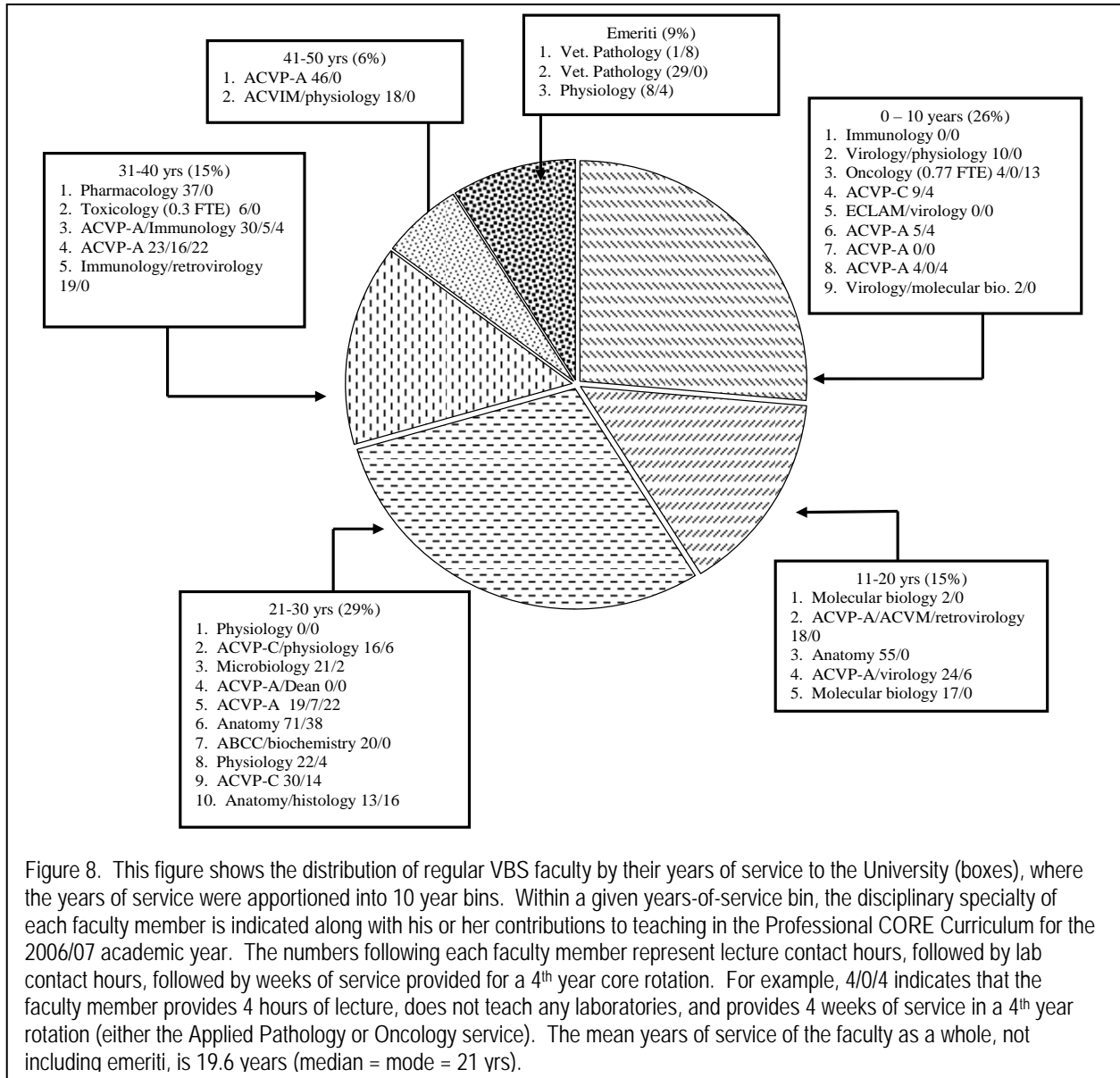
* = interim team leader

~ = co-team leader

VBS Faculty Contributions to the Professional Education Curriculum: Department faculty represent approximately one third of the regular faculty (regular tenure-track and regular clinical) in the college (31/105 head count). Collectively, VBS faculty members have contributed an average of 19.6 years of service to the University (Fig. 7 above). Among disciplines, those most represented in the Department include veterinary anatomic and clinical pathology, as well as the general areas of microbiology, physiology, and cell biology, as judged by professional affiliations, teaching assignments, and spread across the years of service spectrum (Fig. 8 below). VBS faculty members teach a wide variety of disciplines in the core professional curriculum, including anatomy, physiology and pharmacology. They provide 46.3% of the lecture hours, 20.2% of the laboratory hours and 1.5% of the year 4 clinical service rotation days in the professional core curriculum (Table 5).

VBS faculty members are team leaders (including interim and co-team leaders) for 36% (15 of 42) of the didactic core curriculum courses representing 51% of the credit hours (73 of 142) for years 1-3. They are team leaders for 6% of the clinical rotation courses for year 4 representing 8 % of the clinical rotation credit hours (5 of 63 credit hours)(Table 5). Our faculty members participate in 48% (20 of 42) of the didactic core courses representing 68% of the credit hours and in 12 % (2 of 17) of the clinical rotation courses representing 8% of the credit hours. VBS faculty members teach 15 of 61 courses in the professional elective curriculum (330-370 out of 1330-1640 teaching hours)(supplemental material). Based upon these data several conclusions can be drawn from the involvement of VBS Faculty including:

- VBS faculty members teach elective courses in the professional curriculum that attract students in regular and repeating numbers in the areas of pathology, clinical pathology, virology and cardiology.
- VBS faculty members teach graduate courses (some of which may also be taken by professional students) that attract students in regular and repeating numbers in the areas of pathology, endocrinology, and oncology
- Only 5 of the 31 VBS (non-emeritus) faculty do not participate in the professional curriculum; 3 because they are new faculty and have not yet assumed any teaching responsibilities.
- The majority of the teaching load in the professional curriculum is carried by senior level faculty, with the highest percentage being assumed by faculty with between 21 and 30 years of service.
- Teaching responsibility in the areas of pharmacology and anatomy are carried by a small number of faculty members, resulting in high teaching loads in those areas.
- The faculty member responsible for teaching pharmacology and who has assumed additional responsibility for teaching toxicology has over 31 years of service to the university, suggesting that this teaching will likely have to be assumed by someone else in the next 5 – 10 years.
- Two of the 3 anatomists have over 21 years of service to the university, suggesting that replacement faculty members might be needed within the next 10 years.
- Although several faculty members with expertise in pathology have retired, there appears to be adequate numbers of faculty pending current recruitments to assume the teaching load in this area.
- Since the last review, two faculty members with expertise in laboratory animal medicine have join the department, perhaps suggesting an opportunity for additional course offerings in the area of comparative medicine, which may have broad appeal across the university.



Outcomes of Teaching in the Professional Curriculum: Outcomes assessment for the College Professional Curriculum was recently reviewed by the American College of Veterinary Medical Association during the successful full accreditation of the College in 2007. The measures that were addressed during this process were developed in context to the college mission. This assessment is summarized below; complete is available upon request.

National standardized testing: NAVLE (NBE and CCT) school score report data and passage rates over the past five years (Table 6 below)

Table 6: NAVLE Scores

Year	Students taking exam	Students passing exam (%)	Average scores
2000-2001 - NAVLE	127	121 (95%)	532

2001-2002 - NAVLE	127	124 (98%)	541
2002-2003 - NAVLE	133	126 (95%)	529
2003-2004 - NAVLE	134	131 (98%)	528
2004-2005 - NAVLE	130	127 (98%)	520
2005-2006 - NAVLE*	132	116 (88%)	500

Employment Rates: Over the past 5 years, 82 to 87% of students who completed surveys provided at graduation already had jobs. The average number of job offers was 2.5 per OSU student compared with a national average of 2.1 job offers per student over the same time period. The average starting salary of all OSU graduates between 2001 and 2005 was \$41,911 compared with a national average of \$41,641 during this same time period. Increasingly, our students have applied for internship positions and have been very successful. Over the past 5 years, the number of students applying for internships has doubled from 15 in 2002 to 32 in 2006 and the success rate has ranged from 73 to 89%.

Assessments of Graduating Seniors and Assessments of Alumni: Alumni of the College are surveyed 1 and 5 years after graduation to assess their perception of how well the curriculum prepared them for their professional careers. At the same time, employers of new (1-year) graduates are surveyed. A uniform survey has been used since 2003, but before that time a variety of formats was used and the data obtained are not readily comparable. Approximately 85% or more of 1-year and 5-year alumni felt their education was good or excellent. Their level of comfort with their overall technical competence ranged from 6.42 to 7.01 on a scale of 1 to 10. Areas of highest level of comfort included history taking, physical examination, and administering intravenous injections. Areas of lowest level of comfort included orthopedic surgery, ultrasonography, business and reproduction. Students in the class of 2006 were asked to participate in an on-line survey of the strengths and weaknesses of the College as well as their perception of how well the program prepared them in various areas. The survey was completed by 92 of 134 (69%) students. Students feel the greatest strengths of the program are the high-quality dedicated faculty, the breadth and diversity of the curriculum, and the large and diverse caseload of the teaching hospital. Perceived weaknesses include excessive emphasis on small animals in the curriculum and insufficient hands-on experience in the pre-clinical curriculum. Students regard dependence on student labor in the hospitals arising from a high caseload in most areas as a weakness of the clinical curriculum. Faculty recruitment and retention and facilities replacement were clearly identified by graduating students as the most crucial issues facing the College in the near future.

Assessments of Employers: Employers of graduates are assessed with the same survey instrument used for alumni. A uniform survey has been used since 2003, but before that time a variety of formats was used and the data obtained are not readily comparable. Employers list thoroughness, communication skills, confidence, medical knowledge and ability to work independently as the employee qualities most important to them. Employers surveyed rated their overall level of comfort with the technical competence of new graduates as 7.1 to 7.2 on a scale of 1 to 10. Areas of highest level of comfort included history taking, physical examination, parasitology, medication prescription, and fluid therapy. Areas of lowest level of comfort included orthopedic surgery, ultrasonography, and business.

Assessments of Faculty: In 2006, faculty members were asked to complete an on-line survey about the adequacy of College resources and student preparation after finishing the pre-clinical and clinical phases of the curriculum. All faculty members felt the library and information resources were excellent or adequate, and the majority felt caseload was adequate or excellent. Nearly half of the faculty felt the facilities were inadequate. The survey included faculty working in both newer (i.e. Galbreath Equine Center built in 1996) and older (i.e. Veterinary Teaching Hospital built in 1973) facilities. When considering student improvement between the beginning and end of the pre-clinical phase of the curriculum, areas in which scores (on a scale of 1 to 5) improved by ≥ 1.0 included clinical skills, integration of basic and clinical science, diagnostic skills, patient management skills, knowledge base in farm animals, and knowledge base in small animals. When considering improvement between the beginning of the clinical phase of the curriculum and graduation, areas in which scores (on a scale of 1 to 5) improved by ≥ 1.0 included clinical skills, diagnostic skills, patient management skills, veterinary client interaction skills, clinical competency in small animal, and population care in small animal. Cited strengths of both phases of the curriculum included high quality experienced faculty, breadth and depth of the curriculum, and a large and diverse caseload. Cited weaknesses of the pre-clinical curriculum were the large amount of information students are expected to assimilate, insufficient oversight of the curriculum, and insufficient opportunity for small group learning. Cited weaknesses of the clinical phase of the curriculum were difficulty retaining high quality clinical faculty, inadequate physical facilities, and excessively short clinical rotations. Faculty recruitment and retention and replacement of outdated facilities were cited as the two most important issues facing the College in the near future.

In 2006, interns and residents were asked to complete an on-line survey about the adequacy of College resources and student preparation at graduation as compared to entry into the clinical phase of the curriculum. The majority of interns and residents felt the caseload was excellent and all of them felt the library and information resources were excellent or adequate. Approximately half of the interns and residents felt the physical facilities were inadequate. The survey included interns and residents working in both newer and older facilities. When considering improvement between the beginning of the clinical phase of the curriculum and graduation, areas in which scores (on a scale of 1 to 5) improved by ≥ 1.0 included clinical skills, diagnostic skills, patient management skills, problem-solving skills, clinical competency in small animal, and practice management and business skills. Cited strengths of the clinical curriculum included dedicated clinical faculty, high caseload and large amount of "hands-on" clinical learning and case responsibility given to students. Cited weaknesses included insufficient length of clinical rotations, failure of students to learn how to think independently and insufficient tracking. Replacement of physical facilities and faculty recruitment and retention were cited as the two biggest issues facing the College in the near future.

Additional Benchmarking: The quality of our core and elective courses is monitored by review of student evaluations and discussion at quarterly Council on Education meetings. Students complete evaluations of instruction for all courses (available at <http://vet.osu.edu/1064.htm>) and a system of peer evaluation of teaching allows instructors to benefit from the suggestions of colleagues. Students submit evaluations of their off-campus

elective experiences, and veterinarians participating in these programs evaluate student performance. The graduate studies committee monitors the progress of residents and graduate students in the College. Resident evaluation forms are completed by supervising faculty clinicians, progress reports are completed by residents and graduate students, and exit interviews are conducted with finishing residents. The number and competitiveness of our internship and residency programs and the success of our trainees in their careers are additional indicators of program quality. The Hospital Executive Committee monitors the caseload of the teaching hospital. As tracked by the Hospital Information System, our caseload has grown approximately 16% in the past 5 years from just under 30,000 to nearly 34,500 yearly patient visits. The origin and number of patient referrals is monitored, and client satisfaction surveys were conducted yearly between 2003 and 2005. Additional indicators of the success of our educational program include faculty extramural awards, honors, and scholarly activity and textbooks published by faculty members (see previous sections for VBS indicators). Participation of faculty members in local, regional, national and international continuing education programs also reflects the quality of our educational programs. Success in development, public relations, and alumni affairs allows us to showcase our educational programs and capitalize on their quality. The quality of our library and information technology services facilitates the success of our educational mission. Institutional outcomes

Progress in Meeting its Mission: With broad faculty input, the College formulated a strategic plan in 2002 that included specific strategic goals in many areas of endeavor including research, student quality and diversity, educational programs, facilities and delivery of clinical services, development, and public relations. Existing strategic goals are evaluated on an annual basis by the Deans and Chairs Advisory Group to determine if these goals remain realistic and desirable in the present educational and economic climate. If judged appropriate and realistic, progress is evaluated and adjustments are made to assure continued success in achieving the goals outlined in the strategic plan. Information used to evaluate progress includes research activity (e.g. intramural and extramural grants and contracts, scientific publications), measures of student quality and success (e.g., entering GPA, number of applicants per seat, NAVLE scores, salaries, numbers of job offers), student and faculty evaluations of curriculum, benchmarks of faculty success (e.g. awards, honors, scholarly activity, textbooks, continuing education), assessment of clinical programs (e.g., caseload, hospital revenue, client satisfaction surveys, tracking of referrals), development (e.g. gifts, endowed positions), and public relations.

The College compares itself to other Big Ten universities that have veterinary schools (i.e., Illinois, Michigan State, Wisconsin, Purdue, Minnesota) as well as to a group of other highly successful veterinary programs (i.e., University of California at Davis, Cornell, Colorado State, Pennsylvania, Texas A&M, North Carolina State) using the Comparative Data Report of the Association of American Veterinary Medical Colleges. Data compared and evaluated include faculty numbers, student numbers, tuition, total budget, state appropriations, research expenditures, and patient visits. These comparisons allow the College to assess itself relative to its peers and determine which areas of the strategic plan to modify.

Resources and Organizational Structure: The facilities of the College range from adequate to excellent in their ability to meet our educational purposes. The new Veterinary Medicine Academic Building (VMAB) is excellent and provides high quality teaching laboratory space as well as a state-of-the-art computer laboratory and library. The new Marysville Large Animal Ambulatory Services Clinic provides professional students with unparalleled clinical experience that simulates private practice. The Galbreath Equine Center is an excellent resource for teaching equine medicine and surgery. Sisson Hall provides very good facilities for teaching of anatomy and administration of the veterinary preventive medicine program. Despite some recent modifications such as remodeling of the hospital auditorium and student lounge area, the Veterinary Teaching Hospital (VTH) must be renovated and supplemented with an additional hospital facility. It is a crowded, high traffic facility that receives heavy usage and is more than 30 years old. Goss Laboratory also needs replacement, but some of the research space of the College has shifted to VMAB allowing Goss Laboratory to remain functional despite its age. The College has been working with Flad and Associates to plan for facilities replacement. Currently, a development plan is being devised to raise \$40 million for renovation of the VTH and building a new small animal hospital facility.

The College's faculty is excellent but insufficient in number. Central university administration is aware of the challenge in recruiting and retaining sufficient numbers of high quality clinical faculty in a competitive private sector market. Our faculty members participate in university governance, and the dean's previous experience as Vice President for Research provides ready access and good communications with the Provost's office and central campus. Strong participation on university committees has resulted in several university awards for service to faculty members in our College.

Financial resources for our programs are adequate and have grown reasonably well over the past 5 years. State support has been relatively unchanged, and growth has occurred in tuition, sponsored program revenue, and hospital revenue. Tuition cannot be relied upon for future growth considering the extent of veterinary student educational debt. Veterinary educational debt relative to the earning potential of newly graduated veterinarians is an issue of national concern. We need to look toward development and entrepreneurial partnerships for future financial growth to support both endowed positions as well as facilities replacement.

Our College continues to attract excellent students based on entry GPA and numbers of applicants per available seat. We continue to produce graduates who are in demand in the private practice sector based on numbers of job offers, starting salaries, and feedback from employers. Employer feedback indicates that our graduates are well-prepared for practice in part due to our high caseload and the large amount of patient care and client communication responsibility our students shoulder in the clinic.

The organizational structure of the College currently is adequate, but operating at capacity due to recent consolidation of Student Affairs and Academic Affairs into one office. Oversight of curriculum and management of student activities both occur through this administrative area. A new administrative position for Clinical Programs and Opportunities will facilitate redistribution of administrative effort. The new office of information technology will allow consolidation and improvement in the College's information resources as well as continue to move our recently designed website forward.

Assessed of Overall Educational Process: If your program assesses other outcomes, briefly describe the results. Peer review of faculty scholarly activity is carried out by departmental promotion and tenure committees that act in an advisory capacity to the chairs. Each faculty member undergoes annual performance review at the departmental level and these reviews are used in making decisions about salary increases. Scholarly activity also is assessed by consideration of faculty honors and awards. Our faculty members have received several Ohio State University Distinguished Service, Professor, and Scholar awards in recent years. Between 2004 and 2005, four of our faculty members have been inducted into American Association for the Advancement of Science and one was inducted into the National Academy of Sciences. Our faculty members have been named Extension Veterinarian of the Year and won international clinical awards such as the Bourgelat Award. Success in faculty development is evidenced by completion of sabbaticals, supported in one case by receipt of a Fulbright Scholarship. Our faculty members serve as editors of scholarly journals and have authored 13 textbooks between 2001 and 2006. Numbers and types of intramural and extramural grants and contracts awarded to faculty, numbers and quality of peer-reviewed publications, and service on NIH study sections are indicators of faculty success in biomedical research. According to ScienceWatch (May/June 2005), Ohio State University's College of Veterinary Medicine ranked third behind the U.S. Department of Agriculture and U.C. Davis in numbers of citations for scientific publications between 1994 and 2004. The College recognizes the excellence of its faculty with yearly awards including the Pfizer Research Award, Norden Distinguished Teacher Award, Charles C. Capen Award for Teaching Excellence in Graduate Education, and the Dean's Award for Creativity in Teaching. A high degree of faculty participation in regional, national, and international continuing education is an indicator of faculty achievement in postgraduate veterinary education. To some extent, the success of our foreign visitor program in Veterinary Clinical Sciences is a consequence of the exposure of veterinarians around the world to the teaching styles of our faculty. Our faculty members also participate as officers and committee members in their specialty professional organizations such as the American College of Veterinary Internal Medicine, American College of Veterinary Surgery, American College of Veterinary Pathology, and American College of Veterinary Radiology. Finally, unsolicited letters of commendation by satisfied clients are another informal indicator of the excellence of our clinical faculty members.

Use of Outcomes to Improve the Educational Program: Students evaluate all courses in the curriculum yearly, and these evaluations as well as unsolicited suggestions from students are taken into consideration in making adjustments to the curriculum. For example, student concern about inflexibility in the curriculum in part led to recent development of selective clinical rotations that provide students with opportunities to tailor their clinical experience to areas of special interest. Selective rotations are available to students in numerous areas of clinical endeavor not available in the core clinical curriculum. Examples include clinical pathology, avian and exotic animal medicine (including selective rotations at the Cleveland and Columbus Zoos), diagnostic imaging, ultrasonography, radiation oncology, and dairy and beef cattle operations. The Shelter program allows students to acquire substantial hands-on experience with routine surgical procedures such as spaying and neutering. This program was developed in response to student, employer and alumni input suggesting that students would benefit from additional surgical experience before graduation. Elective courses in

clinical endocrinology, gastrointestinal endoscopy, case-based problem solving, and clinical pathology have been developed in response to student requests for more educational opportunities in these areas.

In response to employer and alumni surveys that indicated a need for enhanced education about the business aspects of practice, the previous ethics and jurisprudence course was expanded to include topics such as basic life skills, career strategies, leadership success, communications, career development, business management, practice success and professional development. In the clinic, a course devoted to client communications has been developed to make students more comfortable interacting with clients. The course features videotaping of students while taking histories from owners, and these videotapes later are reviewed with the students by faculty allowing for valuable constructive criticism. Learning objectives for the professional students are listed in the syllabi for many of the core and elective didactic courses.

The Senior Student Rotation Grading System (SSRGS) is the assessment tool used to evaluate the clinical competency of professional students in their core clinical rotations. It has 2 parts: one evaluates students on science, knowledge and technical skills and is graded on a letter basis and the other evaluates students on their professional and interpersonal skills and is graded on pass/fail basis. This form evaluates specific clinical objectives such as skills and efficiency in techniques, medical records keeping skills, client and patient compassion, patient handling and husbandry, and communication skills. In addition, the SSRGS provides a mechanism by which clinicians can provide written comments and constructive criticism that can be sent directly to students by email. In 2006, the SSRGS was completely redesigned by the College's webmaster and the Office of the Associate Dean of Academic and Student Affairs. The clinical competency of students is evaluated informally in many other ways during their clinical rotations. Understanding of the pathophysiology of disease, interpretation of diagnostic information, assessment of patient condition, and skill in developing therapeutic plans all are evaluated informally on a daily basis during ward rounds. The success of students in these areas ultimately is reflected in the grades they receive on the SSRGS and in the email comments that are sent to the students using this system. In the client communications course, the students complete videotapes of client interviews. Students self-assess these videotapes (i.e., strengths, weaknesses), receive input from other students in the course, and finally are evaluated by the instructors. Four communications skills are evaluated: non-verbal communication, open-ended questioning, reflective listening, and empathy.

The understanding and accomplishments of our students with regard to biomedical research is evaluated by monitoring the number of students participating in the College's summer research program for students and by the number and success of students who participate in and present posters at research day.

Support and Infrastructure for Professional Veterinary Educational Program (Selected Examples): The Department budget is implemented on a distributed model, which allows flexibility at the Department level to invest in educational support and infrastructure to enhance teaching. This monetary investment within the VBS Department occurs on a continuing basis and is extensive, but recent examples include: 1) purchased anatomy laboratory dissection tables in response to an increase in veterinary student enrollment, 2) upgraded conference room furniture to accommodate student tablet style chairs, 3)

purchased computer hardware and software upgrades for all teaching and research faculty, 4) hired pathology instructors to help with teaching to maintain competitive training program, 5) replaced outdated video monitor system in the anatomy lab, 6) purchased 6 new TV monitors in teaching laboratories and replaced three computer stations in anatomy labs, 7) hired veterinarians in the community to provide "real world" experience for students in anatomy and toxicology, 8) supported faculty in summer leave programs to enhance their teaching skills and attend workshops and educational courses, 9) support of graduate career activities to promote career development and exposure of students to potential employers, and 10) sponsorship of veterinary student clubs and luncheons for career and elective course education.

Graduate Studies Program

Scope of Department Involvement in Graduate Education: We have three primary educational roles: professional, post-professional medical specialty, and graduate studies. The Department has a limited role in undergraduate teaching. The type of student is different for the different roles, and so the student population will be discussed in the context of their specific pursuit. The combined (DVM/MS) degree program is a fourth role, but this is not a distinct focus. Instead, the combined degree program is feeder program for graduate education leading to the PhD, drawing upon professional degree students. As such, the combined degree program will be presented under graduate education. There is much overlap between post-professional medical specialty (i.e., veterinary anatomic and clinical pathology) and graduate education within the department, reflecting our current paradigm of combining the two endeavors. Accordingly, medical specialty training will also be discussed in the context of graduate education.

Graduate Education (+/- Medical Specialty Training): Graduate students within the department fall into four categories: students from Interdisciplinary Graduate Programs of The Ohio State University, including the Molecular, Cellular and Developmental Biology (MCDB) Program and The Ohio State Biochemistry Program (OSBP); DVM students engaged concurrently in veterinary pathology medical specialty training and graduate studies; direct applicants to the VBS graduate program; veterinary medical professional degree students that are concurrently enrolled in graduate studies leading to an MS (i.e., combined degree program). All but the combined degree program are primarily focused on dissertation research leading to the PhD. Drawing from such a broad student base assures program quality, both in terms of the individual applicant, but also in creating a multidisciplinary approach that is germane to competitive biomedical research programs. The following data characterize our graduate program in the context of our academic plan, which emphasizes program quality.

Program Resources and Outcomes in Graduate Education:

Graduate Office and Research Space: We have been successful in assigning permanent desk space to the majority of students enrolled in the VBS graduate program. Currently, 61/68 students (90%) have assigned desk space, being located in either the same building as the laboratory supporting the dissertation research, or in buildings supporting veterinary pathology residency training in the case of those involved in combined residency/graduate education programs (i.e., the Veterinary Medicine Academic Building, VMAB, and Goss

Laboratory). The 7 students without individual desk assignments are either combined DVM/MS students or perform their research in laboratories not located in the college of veterinary medicine, with the exception of two. These two students share desk space. Individual desk assignments are available to these individuals in the Veterinary Teaching Hospital (VTH), but such space is viewed as less desirable since it lacks proximity to the research laboratories. Available desk space in Goss Lab that is not used by students is assigned to staff, post-doctoral fellows, and research scientists. For VMAB, this additional space is also assigned to students from other departments. In VTH, the majority of the space not used by VBS students is not assigned.

Technical Support: Technical support is provided for shared equipment, representing an important source of instruction for students that supplements that provided by faculty and other staff. Core areas with dedicated staff include Imaging (i.e., flow cytometry, *in vivo* imaging, confocal microscopy, electron microscopy), Mouse Phenotyping, Histology and Immunohistochemistry, Biochemistry and Molecular Biology (e.g., real time PCR, surface plasmon resonance), Applied Anatomical and Clinical Pathology.

Coursework: Doctoral and masters students engage in graduate courses administered by multiple colleges within the university, provided unparalleled access to expertise in numerous scientific disciplines. Both MS and PhD students must complete 30 credit hours of formal graded graduate coursework that includes a minimum of 3 hours in statistics. Specific courses selected are defined by the students advisory committee, taking into consideration the strengths and weakness of the student's educational background and the nature of the research project that is the basis for the student's dissertation/thesis. We use this "tailor-made" approach to a student's curriculum in order to accommodate the diverse backgrounds of students entering the program. Requiring a physiology course for a DVM student or a basic microbiology course for an individual with an undergraduate degree in microbiology could represent inefficient use of time and energy in a more static curriculum. Courses heavily subscribed by VBS students are listed in **supplemental materials**, and fall within disciplines of cellular and molecular biology, biochemistry, pathology, laboratory animal science, microbiology, immunology, and oncology/cancer genetics. Although courses are taught by faculty from multiple departments within The Ohio State University Health Sciences Center, VBS faculty members are widely engaged, participating in courses in microbiology, pathology, laboratory animal science, oncology/cancer genetics. Additional course requirements include enrollment in the departmental research seminar (VBS 850) and completion of a course in biomedical ethics. Remaining credit hours reflect laboratory work supporting the dissertation/thesis.

Student Oriented Seminar Format: Weekly departmental research seminars are given by students. This activity hones presentation skills, drawing upon feedback from faculty and other graduate students in attendance.

Development of a Graduate Student Organization: A graduate student association has been established at the departmental level, providing a networking resource that has been used to host special events relevant to career development, and to identify areas of where our graduate program can improve.

Recognize Graduate Student Achievements: Student achievements are highlighted regularly in a departmental newsletter. More formal recognition is based upon student research presentations and publications emanating from their dissertation research. Student presentations at the weekly research seminars are evaluated by faculty and graduate students, and the top two presentations for the year are recognized by travel awards funded by the Roche Corporation. Students also submit first authored manuscripts that are evaluated by members of the departmental graduate studies committee (GSC). The top two manuscripts are recognized by travel awards also funded by Roche. Graduate students and veterinary students engaged in summer research experiences present results of their research at the annual Veterinary Research Day, hosted by the College of Veterinary Medicine. Poster presentations are judged by faculty from the three departments of the college, providing critical feedback to the student and recognizing outstanding presentations by making travel awards. Awards are made in the following categories: Immunology and Infectious Disease; Molecular and Cellular Biology; Structure-Function; Clinical Research; Epidemiology and Applied Research; Veterinary Student Research.

Student Travel Support (see awards, above): Travel awards are provided through competitive means, as described above, and support travel to a scientific meeting where the student can present their research. In addition, the department provides support to attend the annual meeting of the American College of Veterinary Pathologists (ACVP), based upon services provided to the departmental surgical biopsy unit (one individual per year, identified by lottery).

Progress on College-wide Graduate Program: Efforts are currently under way to transition to a college wide graduate program. The change would represent an economy of teaching and advising effort, particularly in terms of course development, and also would enhance recruitment efforts. As an example of the latter, we could more readily illustrate how faculty with an infectious disease focus, within one unit (e.g., College of Veterinary Medicine), represent expertise that spans fundamental studies of microbial genetics and pathogenesis (drawing upon faculty in Veterinary Biosciences), public health and epidemiology (drawing upon faculty in Veterinary Preventative Medicine), and translational aspects of microbial-host interaction (drawing upon faculty in Veterinary Clinical Sciences). This effort is being led by the Associate Dean of Research and Graduate Education and the Chairs of the departmental GSCs. Current focus is on the development of a graduate handbook for the combined program.

Broad based Interdisciplinary Graduate Faculty: The Department currently lists 48 total graduate faculty members, being category P (i.e., can serve as mentors for both MS and PhD students) and M (i.e., can serve as mentor for an MS student). The graduate faculty members are listed in the *supplemental materials*. The majority of the departmental faculty members are actively engaged in graduate education to the PhD level: 37 (71%) of our total graduate faculty have primary appointments in VBS (65% P, 35% M). Graduate faculty status is reviewed on a regular basis by the GSC, and requires evidence of active participation in graduate education, publication in their field of expertise, and/or evidence of sustained extramural grant support in order to retain the category P status. This core of departmental

faculty is supplemented by a significant number of graduate faculty members from outside of the department: 15 (29%) have primary appointments in other departments (93% P, 7% M). A minority of graduate faculty is emeritus (4, or 8% of the total).

Efforts to Enhance Recruitment of High quality graduate students: As outlined above, recruitment of high quality graduate student is enhanced by drawing upon a broad base of students, including recruits for the combined residency/graduate program, students from the university interdisciplinary graduate programs, as well as direct applicants to the program. The following provides a snapshot for 2007 (Table 7).

Program Type	MS	PhD	Domestic		International		Total
			With DVM	No DVM	With DVM	No DVM	
Combined Residency/PhD	0	23	21	0	2	0	23
MCDB	1	9	0	4	0	6	10
OSBP	0	7	0	2	0	5	7
VBS PhD (no residency)	0	20	4	3	4	9	20
Combined DVM/MS	4	1	0	5	0	0	5
Other	0	3	0	0	0	3	3
Totals	5	63	25	14	6	23	68

Supplemental materials provided to indicate the composition of the graduate student population having VBS graduate faculty mentors.

Competitive Stipend Support: Since 2005, The Ohio State University began implementing a long term plan to improve compensation and benefits for students on fellowships or trainee appointments paid through the university payroll system. These individuals hold the title of Graduate Research Associates. The cost of benefits reflects a percentage of the annual stipend, and the monies are drawn from the same account from which the stipend is paid. As such, costs of these benefits are borne by the faculty mentor. Over the three year period in

which this university plan has been implemented, the benefits rate has increased 1.2%, the student subsidy for health insurance has increased by 5%, and the student's subsidy for dependents' health insurance has increased by 30%. See **supplemental materials** for details.

Participation in Multidisciplinary Graduate Programs (Molecular, Cellular, and Developmental Biology, Ohio State Biochemistry Program, Biophysics Graduate Program): Participation in multidisciplinary graduate programs provides faculty access to a large population of high quality graduate students. Graduate education is the sole focus of these students. These programs have established recruiting mechanisms, provided a structured core curriculum that is required for each student, and supports laboratory rotations that assure the optimal fit of student and mentor. Aside from our combined graduate education/residency program in pathology, this is the only formal recruitment/rotation system. The cost of participation is significant. Total contributions to the Biochemistry Program (OSBP) and Molecular Cellular and Developmental Biology Program (MCDB) total \$507,991.26 for the past five years. These costs are paid by the Department through cash and over the past 2 years split with the Dean's Office with college contributions. The cost of participating in MCDB and OSBP more than doubled from 2006 to 2007, and the college contribution was designed to buffer the impact of this dramatic increase.

Departmental Costs 2003 -2007:

2007	MCDB	\$98,684	OSBP	\$89,032
2006	MCDB	\$42,865	OSBP	\$46,345
2005	MCDB	\$48,222	OSBP	\$16,478
2004	MCDB	\$35,130	OSBP	\$16,700
2003	MCDB	\$51,834	OSBP	\$13,443

Table 8. Veterinary Student Summer Research Program 2003 - 2007

Year	Total Number of VBS-mentored students	Total Number of Students	Stipend Amount for summer quarter	Total VBS funding for stipends**	Total College funding for stipends (includes VBS amount)
2003	6	13	\$5,000	\$38,000	\$63,000
2004	9	11	\$4,500	\$19,000	\$45,000
2005	11	15	\$4,000	\$16,800	\$60,000
2006	15	20	Most at \$4,200	\$26,500	\$84,000
2007	11	28	\$4,200	\$10,500	\$118,200

**includes both dept. contribution as well as individual faculty member contributions

***Does not include benefits for several students at ~10%, nor the in-kind donations of food, transportation to events, etc.

Summer Research Experiences for Veterinary Students: The VBS Department is a leader in providing summer research opportunities for veterinary medical students (Table 8). The goal of this program is to expose students to this aspect of veterinary medicine in order to increase the number of individuals that will apply to graduate programs or in other way consider a research-oriented career track. The number of students mentored by VBS faculty

has grown, with substantial growth in the college-wide participation in the program (and college financial support).

Department Efforts to Enhance Stipend Support for Graduate Education: The Department has provided tuition and fee authorizations from funds provided during budget restructuring in 2003. As noted earlier, this is a diminishing pool of funds that has not expanded since 2005 due to College policies of not increasing these funds by the cost of inflation of graduate tuition or fees. The Departmental has responded by increasing the investment from extramural funding sources to cover these costs, endowments (Barber charitable trust), develop industry sponsored fellowships, land university fellowships, and support student applications for government-funded fellowships. Currently, the VBS Department has 44 PhD students in its graduate program, 6 MS/DVM or PhD/DVM combined degree students, and 20 additional students through one of the interdisciplinary programs or other departments (OSBP, 6; MCDB, 11; Public Health, 1; Molecular Genetics, 1; Biophysics, 1).

Source of stipends for 2007 are as follows:

Table 9. Graduate Students and Funding 2007		
Funding Source	VBS	
	MS	PhD
Investigator Grants (RO1, PO1, etc)	1	39
NIH Training Grant (T32)	-	6
NIH K, F and NSRA	-	6
Endowed Fellowships	-	3
Employee Benefits Program	-	-
Corporate Fellowships/ACVP	-	3
Self-funded (DVM/MS & other)	6	-
Department	-	3
Veterinary Teaching Hospital	-	-
Foreign Governments	-	1
Military	-	-
University Fellowships	-	2
Total	7	63

Support for Tuition and Fees: The Department uses a variety of strategies to pay for tuition and fees are covered by multiple sources. The NIH T32 Mouse Pathology Training Grant supports the tuition and fees for 6 PhD students through the employee benefits program. 43 PhD students are supported by graduate fee authorization distributed from the College based upon a budget redistribution model established in 2003. One PhD student has a corporate funded fellowship from Eli Lilly. Two additional pathology residents in the PhD program have corporate sponsors are supported by the American College of Veterinary Pathologists/Society of Toxicological Pathologists coalition. Three PhD students are supported by a College of Veterinary Medicine endowed fellowship (Barber Fund). Two PhD students have University Fellowships. Five students from the Veterinary Biosciences are

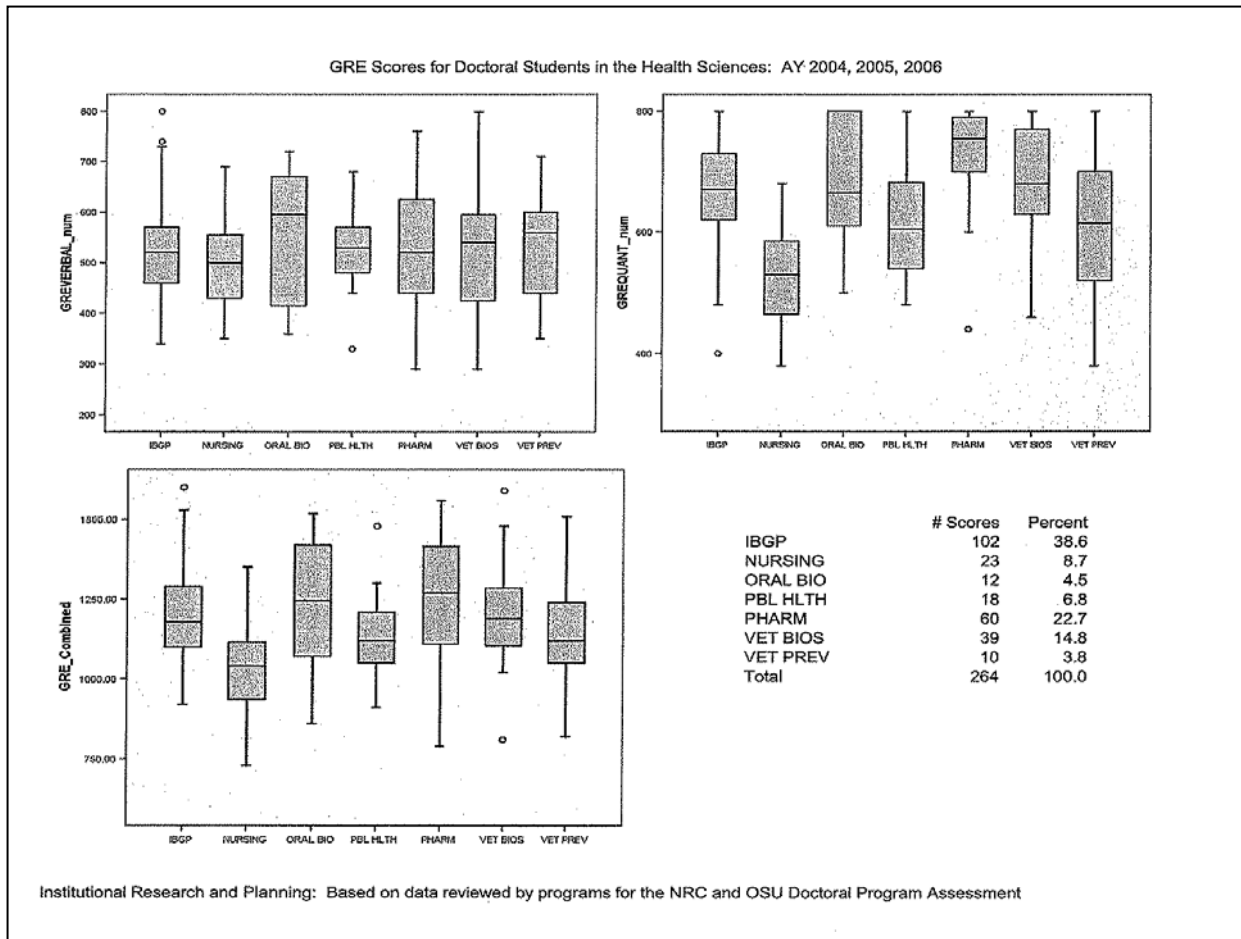
supported by investigator initiated extramural grants (NIH RO1, PO1, etc). Source of tuition and fee payments for 2007 are summarized in Table 10 (relative to other departments).

Table 10. Tuition and Fee Funding Sources						
Funding Source	VBS		VCS		VPV	
	MS	PhD	MS	PhD	MS	PhD
Investigator Grants (RO1, PO1, etc)	1	4	-	-	3	10
NIH Training Grant (T32)	-	6	-	-	-	-
NIH K, F and NSRA	-	6	-	-	-	-
Endowed Fellowships	-	3	-	-	-	-
Employee Benefits Program	-	-	-	-	1	1
Corporate Fellowships/ACVP	-	3	2	-	-	-
Self-funded (DVM/MS & other)	6	-	-	-	5	-
Graduate Fee Authorization	-	38	15	-	-	3
Department	-	-	5	1	-	4
Veterinary Teaching Hospital	-	-	14	-	-	-
Foreign Governments	-	1	1	-	-	2
Military	-	-	1	-	-	-
University Fellowships	-	2	-	-	-	-
Total	7	63	38	1	9	23

The Graduate fee authorization represents college/departmental support of graduate educational costs. College support will allow us to cover 32 students at the current rate – college-wide. The department therefore takes on a significant role in supporting graduate tuition and fee costs.

**Outcomes Assessments of Graduate Program:
Student Quality**

Graduate Record Exam (GRE) scores: Average GRE scores for VBS students are good relative to College and University averages. Average GRE Scores (Quantitative + Verbal) for our students are illustrated in the following table, distinguishing between students drawn from the interdisciplinary programs and those that are not. The latter are designated “VBS”. Average scores for graduate students at OSU are 1190, and average scores for students entering the College of Veterinary Medicine professional program are 1178. The OSU Health Sciences Center includes 7 doctorate programs included in a recent NRC doctoral program



Year	Overall V+Q*	VBS	MCDB	OSBP
2007	1224	1220	1166	1260
2006	1229	1220	1254	1200
2005	1215	1213	1239	1208
2003 & 2004	1167	1167	n/a	n/a

*Can only include Q+V because some students do not have A sections.

review: Integrated Biomedical Sciences Graduate Program (IBGP, College of Medicine), Nursing, Oral Biology, Public Health, Pharmacy, Veterinary Biosciences, and Veterinary Preventative Medicine. In comparing GRE scores for 2004-2006, average scores in VBS

were 2nd highest for the quantitative section of the GRE (behind Pharmacy), 3rd highest in verbal scores (behind Preventative Medicine and Oral Biology). Combined VBS average scores ranked third behind Oral Biology and Pharmacy, approximating scores from IBGP.

Grade Point Average (GPA): Average undergraduate and DVM grade point averages (based upon a possible 4.0) are good for VBS students, being greater than OSBP and MCDB students.

Year	Overall UG	VBS UG	VBS DVM	MCDB	OSBP
2007	3.53	3.62	3.67	3.07	3.45
2006	3.47	3.54	3.64	3.16	3.39
2005	3.51	3.57	3.65	3.20	3.37
2003-04	3.51	3.51	n/a	n/a	n/a

These averages do not include international students who use different grading scales. However, OSU Grad Admissions requires that all students have at least a B average in order to enter. VBS international students who fall into this category average in the B+/A- range.

Time to Graduation and Graduation Rate: Time to graduation for a student in the VBS program is 5.5 years, which is below the national average in the health sciences by more than 1 year. This time includes the one year of intensive residency training for those enrolled in the combined residency/PhD program. Average time-to-degree for all students, measured by calendar year of graduation from January 1, 2002, to July 1, 2007 is as follows:

Graduation Year	MS (in Years)	PhD (in Years)
2002	1.25	5.75
2003	n/a	5.275
2004	3.625	5.2
2005	2.07	6.09
2006	2.42	5
2007	2.8	5.55

PhD Min: 1.5 (a transfer student)
 PhD Max: 9.75 (student with a disability)
 Overall Average: 5.5

MS Min: 1.25
 MS Max: 4.25
 Overall Average: 2.625

VBS Average: 2.60 for MS, 5.43 for PhD
 MCDB Average: 5.89
 OSBP Average: 6.67

Attrition rates for PhD candidates are low. Since 2002 (until July 1, 2007), the total number of graduates from VBS is 62 PhDs and 14 MS. During this time, 4 students transferred to another program (either OSU or elsewhere), 5 graduated with an MS instead of a PhD, and 2

discontinued graduate studies. The number of students currently matriculating in MS programs is 7 and 63 in PhD programs.

Student Awards: Our students enjoy a substantial success in landing extramurally funded fellowships. In the past 10 years, we have had 14 students on NIH individual fellowships (K08 n = 7, K01 n = 4, F32 n = 3), 12 NIH institutional fellowships (T32), 1 society fellowship (National Sclerosis Society), and 3 Industry sponsored fellowships for a total of 30 fellows. See **supplemental material** for a detailed listing of these accomplishments. The T32 number is artificially low, because students subsequently receiving NIH K awards are included in the latter category and not the former. For the T-32, we've had 5-6 students per year on the award ever since 2004, for a total of 16 students. All fellowship recipients were DVM graduate students. 27 of the 30 fellows were students in the combined pathology residency/graduate education program, representing all of the K08 recipients, 3/4 of the K01 recipients, 2/3 of the F32 recipients, all industry and national society fellows. Students on national fellowships in the last 5 years is more than double (2.75x) that of the previous 5 years, representing 67% of the K08's and all of the K01, F32, and T32 awards. For the current year, 14/68 of our total graduate student population (20%) is supported on national fellowships.

We having increasingly sought (and been awarded) University Fellowships in support of graduate education. The awards by year are as follows:

<u>Year Awarded</u>	<u>Fellowship Type</u>
1993	UF (n = 1)
1994	UF (n = 1)
1995	MYU (n = 1), RGC (n = 1)
1997	UF (n = 1)
2000	UF (n = 1), DUF (n = 1)
2002	UF (n = 1), GE (n = 1)
2004	UF (n = 1)
2006	DGE (n = 1), DDU (n = 1)
2007	UF (n =3)

UF = University Fellowship

DDU=Dean's Distinguished University Fellowship

DUF = Distinguished University Fellowship

GE = Graduate Enrichment

DGE=Dean's Distinguished University Fellowship

MY= Dean's University Fellowship – Multiyear

Graduate students trained in the VBS graduate program are regular recipients of travel awards at Research Day, college of veterinary medicine. They dominate the categories of Immunology and Infectious Disease & Molecular and Cellular Biology represent 43% of award recipients in the Structure Function category, and 62% in the Veterinary Student category. The award break-down is as follows:

Award Category	VBS/Total Award Recipients				
	2003	2004	2005	2006	2007
Immunology and Infectious Disease	3/3	1/1	2/2	3/3	2/2
Molecular Cellular Biology	3/3	2/2	3/4	4/4	2/2
Structure-Function	1/3	1/1	0/1	0/1	1/1
Epidemiology/Applied Research	0/3	--	--	0/1	0/1
Clinical Research	--	0/2	1/2	0/2	0/2
Veterinary Student	3/3	1/2	1/3	2/2	1/3

Student Participation in College Research Day		
Year	Student Number	
	Graduate	Veterinary Medical
2003	38	12
2004	43	12
2005	58	21
2006	64	13
2007	56	23

Number and Quality of Publications Emanating from Dissertation/Thesis:

Supplemental materials will provide – Student first authored publications, emanating from dissertation research, submitted for Roche awards.

Medical Specialty Board Pass Rate:

The program has graduated 30 trainees in the last ten years that are eligible to take certifying examinations of the American College of Veterinary Pathologists. Of these 28 individuals sat the board. Pass rate for anatomic pathology: $28/30 = 93.3\%$; Pass rate for clinical pathology: $6/6 = 100\%$. See **supplemental materials** for a list of trainees and job placement

Doctoral Student Placement: 2002-present will be provided in **supplemental materials**.

Support and Infrastructure for Graduate Education: The Department has invested within the past 5 years extensive resources to enhance the quality graduate students including development of a professionally designed recruitment posters, redesigned website, hiring of a dedicated graduate coordinator staff member (Ms. Janelle Henderson) to support the

graduate students. Ms. Angela Morris has been hired as an Education Resource Staff member to provide materials to faculty and staff related to the educational mission throughout the Department. Graduate records of the department have been centralized and an inquiry system established to provide information to prospective graduate students. To provide more immediate feedback for prospective graduate student applicants to the Department inquiries are answered by phone, e-mail, and mailings of brochures. A Graduate Studies Program website was created to facilitate graduate student recruitment. The website includes faculty profiles, general community information, admissions and financial information, as well as recent fellowship announcements. The Department has developed a Graduate Program Handbook for all entering graduate students. The Department sponsors a Graduate Student Association to foster interaction and enhance the education experiences of our students and has provided funds for student travel to scientific meetings and awards for scientific publications and seminar presentations. Additional or ongoing support includes:

- Continued support of tuition and fees
- Support for submission of fellowships e.g., K08 NIH Fellowships
- Funded instructors in anatomy, toxicology, clinical pathology, and anatomic pathology
- Bridge support for stipends, travel to meetings, graduate student association activities, etc.
- Graduate Studies Program Coordinator (Janelle Henderson)-communications, recruitment, liaisons with graduate school, etc.
- Educational Resources Staff (Angie Morris) and Service Core Staff and Infrastructure

Departmental Rewards for Outstanding Teachers and Students: Rewards for excellence in teaching are recognized as an important component of a vibrant educational environment. The Department provides rewards that recognize excellence in teaching in our annual review process. High ratings directly related to salary merit increases are related to development of new and effective techniques or programs of instruction, publications on teaching in peer reviewed journals in pedagogy or the candidate's discipline, documented innovative contributions to curricular revision, College or University teaching awards, attainment of professional success by graduate students, excellent student evaluations of teaching performance, and high marks in peer evaluation of teaching performance. The Excellence in Education committee, with the support of the Chairperson, has drafted a set of recommendations for departmental policy regarding recognition of teaching excellence. These consider the different goals of recognitions and inducements and how exceptional performance in the administration, quantity or quality of teaching (the "teaching triad") could be identified. Financial rewards will include one-time bonuses or merit increases in salary. The committee agreed that providing department money to "match" financial awards for excellence in teaching that were received by departmental faculty from other sources, such as the college, university, or a professional society was a worthy goal. The committee also recommended that faculty should receive a financial reward for exceptional performance in team leadership. All of these are now incorporated into the reward structure of the department.

Seminar and Publication Awards for Graduate Students: The Department instituted with the support of Roche Pharmaceutical Company awards for outstanding achievements in

seminar presentations or scientific publications. This year for the eighth consecutive year, the research achievements of students within the Department were celebrated at a special ceremony of the *Roche Applied Sciences Distinguished Graduate Awards*. The Roche Applied Sciences graduate award program is a special annual program funded by Roche to recognize the annual progress and outstanding biomedical research productivity of student scientists within the Department. The Roche Award winners in each of two categories receive a gift check (\$400 for first place and \$200 for second place) and a commemorative plaque. An eight-member panel, which consisted of the Veterinary Biosciences Graduate Studies Committee and *ad hoc* faculty members, evaluates finalists against predetermined criteria. The best average scores in both award categories determined the winners.

Graduate Student Leadership Awards: The Department has provided a number of ways to reward students for outstanding educational and leadership achievements. Examples include Ms. Melinda Butsch in 2001 and Dr. Tracey Papenfuss in 2006 both of whom received the *OSU Graduate School Leadership Award*. Both students were, at that time, President of the VBS Graduate Student Association and Ms. Butsch was the former Vice President of the OSU Biochemistry Program Graduate Student Association. Both were outstanding examples of graduate students who developed their leadership skills in our program.

Efforts to Monitor Teaching Effectiveness and Student Learning: A routine evaluation system is administered through the College Office of Educational Resources that has the procedural features most often desired for the generation of summative data used for personnel decisions. The data also serves as an indicator for formative evaluation purposes. The Office conducts student evaluations of every core and elective course in the professional curriculum, with the exception of independent study, group study, and cross-listed courses, under a mandate from the Council on Education. Because of the excellence and long history of the program administered here at the College, the University has agreed to exempt veterinary faculty from participation in the SEI program required in other areas of the institution. The evaluation instruments used for courses consist of 5 tested and approved standard items which are anonymously administered to all students during a scheduled evaluation hour. Three standard questions are also included regarding any instructor scheduled for more than 3 lectures in the course. Faculty can ask to be removed from evaluation. Students are given additional opportunity to write comments on courses or instructors. Course comments are delivered to the team leaders, and instructor comments are delivered to the individual addressed. The numerical results from these evaluations are provided in their entirety to department chairs and deans. Results on the course are provided to all instructors and the team leaders. Results on individual instructors are provided to those individuals. Team leaders are responsible for including the results in their course reports to the Council on Education, which in essence publishes the course results to faculty and students. Educational Resources archives and can provide to faculty or chairs the results of all evaluations administered upon request. Most often, this request will come from the candidate for promotion or review, and that candidate will provide the information in whatever form is required by the reviewing body. It is the policy of Educational Resources to produce for summative evaluation all of the data collected on a candidate, and to clearly indicate the source of data, the method of collection, and the presence of professional opinion or analysis. Educational Resources will produce for a reviewing body any supporting

information that they require about methods, sources or qualifications of reviewing individuals. Because written comments by students, though extremely useful for formative evaluation, are not seen by the University as reliable summative evaluation data, this office does not archive comments. Faculty not wishing to use the services of the Office of Educational Resources or who desire an outside opinion can ask for assistance from the Office of Faculty and TA Development on Main Campus.

Departmental Routine Review of Curriculum for Quality Control: Each course taught within the Department is evaluated by the teaching team. The team leader is mandated to provide student evaluations of courses and address concerns or problems. Peer evaluations of faculty are provided to the faculty member and department chair and are discussed at the end of the course or during annual reviews. Teaching Teams update lecture notes and modify course presentations based on feedback from students and peer reviews. Courses with poor student or faculty peer evaluations are required to address problems and take corrective actions. These actions have included a number of direct actions including changing faculty assignments, providing increased staff to assist students in laboratories, requiring problem based computer supplemental laboratories, etc.

Departmental Monitoring of Scheduling and Sequences to Improve Availability: The Excellence in Education Committee maintains an up to date registry of all departmental elective courses to provide current information to students and faculty within the department. This years survey revealed that the department offers 47 elective courses along with a number of individual and group study courses that allow in depth study of topics beyond the fundamental level of material presented in the core curriculum of the College. The Department works with the Office of Academic Affairs and Office of Educational Resources of the College to monitor and coordinate courses and faculty schedules. Each quarter all faculty members are offered draft schedules of courses to review and proactively prevent conflicts in lectures and room assignments. Courses are offered and coordinated to most efficiently fit professional and graduate student schedules. For example, VBS 730 Endocrinology (Dr. Saiduddin) provided consultation with students and faculty in other departments resulted in moving the quarter and day for this course to increase its availability to interested students. In addition, Department electives are offered at a time that does not conflict with the core curriculum to increase availability to interested students.

Involvement of all Interested Parties in Assessment and Planning of Courses: In addition to procedures illustrated above, the Department routinely instructs team leaders to consult with other VBS faculty and clinicians to ensure that material presented in basic science courses provide a fundamental basis for clinical applications in subsequent years of the curriculum. Additional methods to be inclusive of in the planning process have been departmentally sponsored quarterly *Teaching Forums* (lunch provided by department funds). Topics at luncheons include overviews of syllabi, course philosophy and goals, review of team members and methods of teaching. These provide broad feedback on the design and conduct of courses and help eliminate redundancy of systems based courses.

Department Tracking of Career and Development of Former Students: The Department's Graduate Program employs a Graduate Coordinator who maintains a database

of all graduate students after graduation. Data collected includes employer, forwarding address, title, and information gained from exit interviews on the value of the program and suggestions for improvement in the program. This allows faculty mentors to maintain close contact with former graduate students. Former students are routinely contacted to participate in recruitment activities and in career day planning. For example, the Graduate Student Association sponsored career day in 2002 invited Dr. Salvatore Butera for the Centers for Disease Control and Prevention to discuss with graduate students the options for careers in the U.S. Public Health Service. The Office of Academic Affairs provides the Department the results of annual alumni surveys of graduate veterinarians. These surveys are useful tools to assess the curriculum and to gain important advice from former students on what is required in veterinary practice and the impact of courses taught in the Department.

Departmental Orientation, Feedback and Support for New Faculty and Teaching

Associates: Orientation to departmental resources and support systems are provided to all faculty, staff, and students. The organization of the Department is designed to offer administrative and core services to assist in accomplishing the academic missions of the Department. These core groups are designed to manage resources effectively, provide valuable case material for teaching veterinary medical students and preparing residents for specialty board certifications, and encourage opportunities to improve or expand the state-of-art technology that furthers the educational missions of the Department. New faculty and teaching associates are given complete overviews of the department services, curriculum, staff support, and other educational resources. All faculty members are provided peer evaluation of teaching and this is performed for every faculty member of the College. The evaluation is composed of two parts. The first part of the evaluation takes place in the classroom and clinical teaching areas and utilizes a uniform faculty peer evaluation instrument. For non-tenured tenure track faculty and probationary clinical track faculty, two evaluators are assigned each quarter there is teaching activity. Additional evaluations can be requested at any time by a faculty member or his or her department chair. The pool of evaluators includes all tenured faculty members in the College and is assigned at random. The second part of the peer evaluation consists of a more in depth evaluation of the content of the faculty member's teaching. This part of the evaluation is the responsibility of the Department Chair and consists of a written report on the content of the faculty member's teaching from other tenured faculty with expertise in their area of interest and expertise. Administrative and secretarial services are accessible to all faculty, staff, and graduate students. Secretarial personnel provide assistance with word processing, faxing, copying, scheduling, and other communication assistance. Business office support services provided by the Department include: processing of requisitions for supplies, services and equipment, travel arrangements and reimbursements, fiscal assistance that provides monthly balances on all accounts; budget preparation and special fiscal reporting services; and personnel actions that include processing monthly appointments, hourly payrolls, and benefits.

Examples of Opportunities for Shared Discussion of Teaching Innovations and

Problems: Dr. Jerry Masty has been selected to participate in program for the 2003-04 academic years via the *Scholarship of Teaching and Learning Program*. The various programs of OSTEP are coordinated by The Office of Faculty and TA Development (FTAD) and are supported, in part, by a grant from the Department of Education's Fund for the Improvement of Post-Secondary Education (FIPSE). Activities in this program are designed

to offer tenured faculty a year long opportunity to do research on their teaching and students' learning within their area of expertise. The basis of Dr. Masty's award was an investigation of student performance, achievement and attitude toward anatomic study through a comparison of the traditional lecture/dissection laboratory paradigm with a programmed self-instruction format. In addition to designing and implementing a personal research project on teaching and student learning, OSTEP Fellows participate in events sponsored by the OSU Academy of Teaching or FTAD and attend the Lilly National Conference on College and University Teaching.

Shared discussions are encouraged through departmentally sponsored quarterly *Teaching Forums and Luncheons*. As indicated above under planning procedures, topics at luncheons include overviews of syllabi, course philosophy and goals, review of team members and methods of teaching. These provide broad feedback on the design and conduct of courses and help eliminate redundancy of systems based courses.

The Department website has created a test site that contains a "Teaching Resources" section to provide educational tools to all faculty and students. The website includes a teaching forum for discuss of best methods in teaching and links to educational resources.

Department Efforts to Encourage Attendance at Teaching Conferences and Research and Publish on Teaching: The Department supports Faculty Professional Leave(s) (FPL) and Special Research Assignment(s) (SRA). Both provide faculty with opportunities to focus their attention on scholarly endeavors. The use of leaves has been used to provide faculty with continuing education in the theory and practice of educational methods. Dr. Lynne Olson used a summer quarter *SRA to study in the OSU School of Educational Policy and Leadership*. Her efforts to obtain further training in the area of teaching research, in particular assessment of quantitative educational evaluations have the potential to improve and expand what our curriculum currently offers. These enhanced training in these educational tools are designed to be transferred back to our College to improve educational methods that enhance our mission to provide the finest experiences possible for our students. Thus, we have used the SRA for faculty members who need a quarter free from other duties to make concentrated headway in her or his scholarly or educational endeavors. All FPL and SRA proposals will be evaluated at the Departmental level by the FAC with recommendations to the Department Chair for final approval. The Chairperson will act as a monitoring agent to be sure that the approved purpose for these leaves is fulfilled. Proposed activities for a SRA could include (but are not limited to) major course development and implementation effort as part of an important curriculum revision but not for routine course preparation.

Provision of Resources for Students

Investments in Resources for Students: The Department has invested within the past 5 years extensive resources to enhance the educational experience of students including hiring of a dedicated graduate coordinator staff member to support the graduate students and an Education Resource Staff member to provide materials to faculty and staff related to the educational mission throughout the Department. To provide more immediate feedback for prospective graduate student applicants to the Department inquires are answered by phone, e-mail, and mailings of brochures. A Graduate Studies Program website was created to facilitate graduate student recruitment. The website includes faculty profiles, general community information, admissions and financial information, as well as recent fellowship

announcements. The Department has developed a Graduate Program Handbook for all entering graduate students. The Department sponsors a Graduate Student Association to foster interaction and enhance the education experiences of our students and has provided funds for student travel to scientific meetings and awards for scientific publications and seminar presentations. Graduate students are provided state of the art facilities and technical support through an award winning technology services group. Students are assisted in the use the facilities and provided the opportunity to practice their presentation/teaching skills through regular seminars where they get feedback from the faculty on presentation (teaching) skills. Students are provided awards to attend professional meetings. The department supports a quarterly graduate student newsletter and graduate student association and graduate student website. The Department also sponsors graduate student career days and quarterly recognition reception for graduate students.

Departmental Provisions for Students Access to Teachers and Advisors: The graduate program is oriented toward a close working relationship between the graduate student and advisor. The advisor has the responsibility of overall coordination of the course of study and research of the graduate student, advising the student in the conduct of scientific research, evaluating and promoting effective writing and oral communication, and monitoring the progress of the student. The advisor shares with the student the responsibility of planning and directing an academic and research program. The advisor will chair all committees set up to plan, review, assess and examine the student's progress through the program. Students are encouraged to meet with various members of the faculty to become familiar with the faculty and their research interests prior to selecting an advisor. The Chairperson of the Graduate Studies Committee will guide those students who do not have a specific area of research interest at the initiation of their graduate study, or a member of the graduate faculty designated by the GSC chairperson for the first year.

The Department Provides or Refers Students to Necessary Academic Support Services: The Department and College provide information to all professional students through an extensive orientation at the beginning of fall quarter a complete overview of support services for students. These include information on health care, counseling, financial services, special interest groups, social functions, and academic support services. The Department employs human resource staff and graduate coordinators to assist students in all aspects of class registration, graduate school rules and policies, finding office space, and all other required student services. Additional support is offered by College policy that refers students to University services for counseling and special testing should this be appropriate.

Department Resolves Student Complaints Appropriately: Students who are dissatisfied with their treatment in the professional or graduate program are encouraged to register their complaints with the Dean of Student Affairs, Chairperson of the Graduate Studies Committee or Chairperson of the Department. If the problem cannot be resolved, and a student wishes to file a formal complaint, grievance procedures established by the Council on Research and Graduate Studies are followed. A copy of these procedures is included in handbook provided to all entering students and is reviewed during orientation. All student complaints or concerns of a sensitive nature are handled confidentially as appropriate with OSU policies. Appeals, grievances and misconduct can involve a wide range of issues. The Chairperson or

his/her designee is responsible for implementation of the faculty, staff and student appeals and grievance procedures. When presented with a grievance, the Chair will consult with the Dean of the College and with appropriate University personnel knowledgeable in handling grievances (*i.e.*, relevant Vice Provost, representatives of the Offices of Consulting Services or Legal Affairs) if there is any question regarding proper process or if the grievance includes complex issues. It is hoped that such early consultation can prevent further complication of the issues. In handling any type of grievance, appeal or misconduct, the Chair of the Department or his/her designee will communicate to others as appropriate, that retaliation of any form against a person who files a grievance is illegal and will not be tolerated. Upon written request, faculty or students will have access to his or her personnel file and will have an opportunity to respond to any document in the personnel file.

Opportunities that the Department Provides for Student Learning Outside of the Classroom: Many of the best learning tools in the Department are provided in teaching laboratories, through educational opportunities when students attend scientific meetings and workshops, and during laboratory bench instruction. The Department embraces these opportunities and provides support for resources to encourage these activities. Examples include the use of travel grants for students to attend scientific meetings paid for from Program of Enhancement of Graduate Education funds (PEGS) obtained from the OSU Graduate School (see sections above). Professional veterinary students are encouraged to take advantage of summer internships and research fellowships. Student clubs in pathology have been formed and supported by Department funds. Veterinary students have been given time off formal courses to attend scientific meetings in disciplines of future career interest.

Departmental Facilities for Student Study, Meetings, and Storage: The Department as part of the College policy provides students with access to teaching laboratories and libraries in secure environments. The new VMAB building contains a new state-of-the-art library and computer lab, new student lounge with coffee kiosk, fireplace, and comfortable furniture for small group interactions. Students are provided storage lockers for private use and personal mailboxes. Graduate students have 24 hour access to laboratories and private offices. All students are allowed to schedule meetings on equal basis with faculty and have adequate access to meeting rooms for small groups or individual studies. Small lounge areas with microwaves, refrigerators, and office supplies are provided for all graduate students.

Students Informed of Departmental Decisions and Resources: As stated above the Department has invested considerable resources in communication tools including websites for faculty postings and student specific use, web based course materials and forums, newsletters, email announcements, graduate and professional student affairs offices and support, question and answer periods scheduled in each professional course, and office hours for students. Thus students are treated with high respect and we endorse and embrace the motto that *"They are our students today and our colleagues tomorrow"*.

VI. Service

A. Relationship to Mission: The service mission encompasses the clinical laboratories, and professional, and administrative services. The clinical laboratories provide diagnostic services to the OSU Veterinary Teaching Hospital and the veterinary medical community in the State of Ohio. These laboratories have a dual function of service and teaching, and provide a major contribution to the education of veterinary medical students and the preparation of postdoctoral students for specialty board certification. Professional service is accomplished through dissemination of knowledge to the broad biomedical and veterinary medical communities and to the citizens of the state. Faculty members are also expected to contribute their time and effort to professional services at the national and international level to enhance the Department's reputation and extend its missions impact beyond the University. These include such activities as grant reviews, specialty board examination committees, executive boards of professional organizations, editorial board membership, continuing education programs, and editorship for academic journals. Administrative service involves active faculty participation in the governance of the Department, College, and University.

B. Description and Integration of Activities: Service is an important part of the Department's mission. The Department makes every effort to create an environment with infrastructure and support facilities that will provide incentives conducive to involvement in high-quality service. Veterinary Biosciences faculty members are expected to actively engage in various aspects of service. The Chair's approval of service assignments will be balanced between the overall level and scope of service demands placed on the Department and the availability and stage of career development of the individual faculty member being considered to fulfill the obligations. Examples of service activities are: 1) administrative and committee service to the Department, College, and University; 2) professional and diagnostic support services to the Veterinary Teaching Hospital, Columbus Zoo, and in other University programs of avian medicine and laboratory animal medicine, among others; and 3) professional expertise to public and private entities beyond the University in the form of consultation, continuing education, advising student organizations, participation in national committees, National Institute of Health study sections, panels of experts, among others. State-supported residents, when available, will be assigned to the clinical laboratory service programs that support the teaching activities of the Veterinary Teaching Hospital.

Guidelines for participation in service activities by regular faculty should range between 10-30% of time based on a quarterly average minimum of 40 hr/wk. Specific examples of activities that are included under service activities include, but not limited to:

- Clinical Laboratory (Hematology, Cytology, Clinical Chemistry, Toxicology)
- Applied Pathology (Necropsy & Surgical Pathology)
- College Committees (e.g., Admissions, Councils of Research and Education, Search Committees, etc.)
- University Committees (e.g., Institutional Laboratory Animal Care and Use [ILACUC], Graduate School Committees, etc.)
- Department Committees both standing and *ad hoc* committees
- Public and Private Sector Committees (e.g., NIH, FDA, EPA, Foundations, etc.)
- Journal Editing/Editorial Board Duties/College Grant and Abstract Reviews

- Leadership Roles in Professional Organizations
- Development (Fund Raising)
- Continuing Education
- Consultation (Industry, Government, Practicing Veterinarians)
- Technical Consultation on Research Methods
- Advising Student Organizations
- International Service Activities

The Department of Veterinary Biosciences' management and policies related to core services groups are designed to:

- Manage resources effectively and provide coordinated approaches to core services that assist in the research, education, and service missions;
- Support diagnostic laboratory services to the Veterinary Teaching Hospital, and throughout the University, State of Ohio and nationally;
- Provide valuable case material for teaching veterinary medical students and preparing residents for specialty board certifications;
- Be fiscally responsible by providing clear plans of operation that are academically driven, but budget sensitive;
- Operationally independent, but fully integrated into the missions of the department;
- Be supervised by a faculty director that develops policies of services and collects operational data; and
- Encourage opportunities to improve or expand the state-of-art technology that furthers the research, education, or service missions of the Department

C. Overall Impact of Service Activities: Many VBS faculty participate in clinical services, which include hematology/cytology, clinical chemistry, surgical biopsy, necropsy, immunohistochemistry, mouse phenotyping, molecular diagnostics, confocal microscopy, and flow cytometry. These services contribute substantially to the research and teaching missions of the college and university. VBS faculty members also contribute their time and effort to a wide variety of professional services, such as grant reviews (NIH, USDA, and NSF), specialty board examination committees, executive boards of professional organizations, editorial boards for professional journals and journal editorship, and advisory panels, working groups, and boards of trustees. VBS faculty also participate in many departmental, college, and university administrative activities. The extent to which individual members of VBS engage in these service activities is highly variable. New research and clinical services have been implemented as the program has evolved. Examples of this evolution in services include: 1) expansion of the immunohistochemistry laboratory, 2) expertise was acquired in molecular diagnostics, 3) hematology/cytology and clinical chemistry laboratories were computerized, 4) and cooperative arrangements with the OSU ULAR and the State Diagnostic Laboratory in Reynoldsburg have improved student access to specimens from laboratory animals, pigs, and poultry. In addition, a Mouse Phenotyping Service has been established and serves as a venue for training students in mouse pathobiology and as a tool for researchers using mouse models.

D. Clinical and Research Services: Core services are offered in the Department to serve the OSU Veterinary Teaching Hospital and other key stakeholders, such as the Columbus Zoo, and regional veterinarians seeking necropsy services. In addition, the cores provide specialized services to support the research and educational missions of the Department. Each core has written policies of operation, identified faculty supervisors and appropriate staff support. Earnings accounts generated from user fees are used to reinvest back to the core to support operations or provide incentives for personnel involved in the service. Each service is supported by the general administrative services in the Department and faculty supervisors report to the Department Chair. The following service cores have been established to contribute to the missions of the Department <http://www.vet.ohio-state.edu/230.htm> :

Applied Pathology: Applied pathology services include post mortem examinations performed on cases from the Ohio State University Veterinary Medical Teaching Hospital and on cases from referring veterinarians, a biopsy service limited to cases from the Veterinary Medical Teaching Hospital and a library which is responsible for distributing results, keeping records and microslides on necropsy and biopsy cases and providing pathology teaching materials to faculty and students. Applied pathology services include post mortem examinations performed on cases from the Ohio State University Veterinary Medical Teaching Hospital and on cases from referring veterinarians, a biopsy service limited to cases from the Veterinary Medical Teaching Hospital and a library which is responsible for distributing results, keeping records and microslides on necropsy and biopsy cases and providing pathology teaching materials to faculty and students. Biopsy services are available to cases from the Ohio State University Veterinary Medical Teaching Hospital only.

Biochemical & Molecular Core: This core was formed in 2002 to focus the department's investments in shared-use infrastructure. The goals of the core are to provide and maintain selected instrumentation and to provide sufficient training to facilitate end-user operation. Major pieces of supported equipment include: Real-time PCR (Roche light cycler), Surface plasmon resonance biosensor (Biacore 3000), Phosphorimager (Molecular Dynamics/Amersham), PTC-225 PCR Tetrad (MJ Research), Alphamager (Alpha Innotech) 2200CA LSA (Packard), Wallac MicroBeta TriLux, Other shared-use equipment include: UV/Vis spectrometer (Lambda 45, Perkin Elmer), Luminescence spectrometer (fluorimeter) (LS55, Perkin Elmer), High pressure liquid chromatograph (Waters), Medium pressure liquid chromatograph (Akta system, Pharmacia Biosciences), Lyophilizer (Freezemobile 25, and Model 10-147, Virtis), French pressure cell (50ml, Aminco) and hydraulic press (Carver).

Imaging Core: ImCore is a College wide service, supported by the Department of Veterinary Biosciences, which offers state-of-the-art instrumentation for flow cytometry analysis, high resolution confocal microscopy, live-animal in vivo luminescence imaging (IVIS) and magnetic cell sorting. Services are offered to eligible faculty, staff and graduate students on a fee-for service first-come-first serve basis. Eligibility is extended to all laboratories within the College of Veterinary Medicine and to non-CVM faculty to which accessibility has been extended by the ImCore Director or Department Chair.

Clinical Laboratories Core: These laboratories provide diagnostic service and professional laboratory expertise to the Veterinary Medical Teaching Hospital, departments and research laboratories within the college and university, and the university laboratory animal program. The Clinical Pathology Laboratories include the clinical chemistry, cytology and hematology laboratories. These laboratories provide diagnostic service and professional laboratory expertise to the Veterinary Medical Teaching Hospital, departments and research laboratories within the college and university and the university laboratory animal program. Samples from multiple species are analyzed daily using state-of-the-art automated equipment. In addition to diagnostic services and specimen analysis, the clinical laboratories provide valuable case material for teaching veterinary medical students and preparing residents for specialty board certification in veterinary pathology, clinical pathology, internal medicine, and surgery.

Services Provided by VBS Department Faculty and Staff

		Hematology	Cytology	Chemistry	Serology	Histo	Necropsy
2007	Transactions	11,958	2,177	12,573	465	1,239	715
	Charges	\$471,534	\$107,707	\$653,362	\$22,901	\$66,345	
2006	Transactions	14,114	2,479	13,878	840	1,323	776
	Charges	\$539,632	\$121,524	\$682,129	\$44,927	\$71,067	
2005	Transactions	15,429	2,502	15,748	889	1,480	827
	Charges	\$470,395	\$114,169	\$704,129	\$44,804	\$66,135	
2004	Transactions	13,887	2,564	15,456	1,078	1,489	780
	Charges	\$410,850	\$110,224	\$648,743	\$41,790	\$64,823	
2003	Transactions	14,119	2,389	16,068	1,115	1,330	1,039
	Charges	\$391,667	\$97,164	\$614,174	\$37,859	\$56,033	
2002	Transactions	13,845	2,113	15,550	1,191	1,263	893
	Charges	\$348,921	\$79,653	\$555,835	\$38,709	\$50,072	

Histology/Immunohistochemistry Core: This core provides animal histology and immunohistochemistry services that support the teaching, service, and education missions of the Department of Veterinary Biosciences. The Department offers routine and advanced histology and immunohistochemistry services, supporting the diagnostic needs of the Veterinary Teaching Hospital as well as the needs of research investigators campus-wide. The Histology Laboratory is managed by a certified Histotechnologist (HTL) and staffed by 2 certified Histology Technicians (HT) and an IHC specialist. The lab is directed by a board certified veterinary pathologist. The lab prides itself on generating rapid turn-around of the highest quality histologically prepared animal tissue specimens. The Histology lab staff possesses considerable experience with a wide range of animal models and specimen types including ocular and orthopedic tissue. Immunohistochemical staining techniques are optimized for animal tissue; a particular area of emphasis is the development of

immunohistochemical staining techniques suitable for mouse tissues. New staining protocols are added periodically, so please check this site for updates on the laboratory's capabilities.

HISTOLOGY / IHC CORE SUBMISSIONS

SERVICE	SUBMISSIONS / YEAR					
	2002	2003	2004	2005	2006	2007
<i>Hematoxylin & Eosin</i>	10405	8359	8984	10077	9975	8034
<i>Special Stains</i>	863	636	1148	617	974	1005
<i>Immunohistochemistry Unstained Slides</i>	689	725	406	1655	2422	1210
<i>(times 5)</i>	1469	1251	1546	2260	2605	2053
<i>Embed Only (times 10)</i>	136	210	171	351	218	106

NOTE: 2007 Figures are through September 2007

Mouse Phenotyping Shared Resource: The Mouse Phenotyping Shared Resource of the Ohio State University Comprehensive Cancer Center is located in the Department of Veterinary Biosciences and provides valuable research services for investigators at The Ohio State University and elsewhere. Genetically engineered mice are being used with increasing frequency in all areas of biomedical research. However, the use of the mice has outstripped the ability of many investigators to characterize and interpret the altered phenotypes that arise. The Mouse Phenotyping Shared Resource provides valuable research services for investigators at The Ohio State University and elsewhere. This shared resource is sponsored by the OSU Comprehensive Cancer Center and is located in the department of Veterinary Biosciences. Services include comprehensive phenotyping of genetically engineered mice as well as histopathology, immunohistochemistry, and special morphologic techniques. In addition, experienced scientists in the Department of Veterinary Biosciences can provide expertise in animal model development, study design, sample collection, and data interpretation. Although services are routinely available for a fee, the possibility exists for collaborative research with members of the Department of Veterinary Biosciences or for referral to outside experts.

Tissue Bank: The Tissue Bank provides tissue procurement for the Biospecimen Repository. Samples of tumors and normal tissue from dogs and cats will be collected and stored for use by multiple investigators. The Tissue Bank provides tissue procurement for the Biospecimen Repository. Samples of tumors and normal tissue from dogs and cats will be collected and stored for use by multiple investigators. Recent advances in genetics and molecular biology have allowed researchers to identify genes and molecules associated with particular human diseases. This knowledge has led to the development of more effective therapies for these diseases. Examples include new treatments for breast cancer, lung cancer, asthma, multiple sclerosis, and rheumatoid arthritis. We have only begun to investigate the genetics and molecular biology of canine diseases, but based on advances in human medicine, a great opportunity exists to make similar advances in treating canine diseases as well. To accomplish this, The Ohio State University college of Veterinary Medicine established a biospecimen repository or "tissue bank" to collect samples from dogs affected by these diseases so that the genetics and molecular biology can be more closely studied. The Tissue Bank (Biospecimen Repository) collects samples of tumors and normal tissue from dogs and cats, and stores these tissues under controlled conditions for future use by multiple

investigators. The Tissue Bank at The Ohio State University was selected by the Canine Comparative Oncology Genomics Consortium (CCOGC) as one of three veterinary institutions nationwide to participate in populating the Pfizer-CCOGC multi-institutional Tissue Bank. This National Cancer Institute-sponsored endeavor emphasizes the importance of comparative oncology research. The Tissue Bank at The Ohio State University follows the guidelines established by the CCOGC for several specific types of tumors and similar established protocols for other tumors. Tissues are collected and archived only after receiving consent from the owners. This sample bank will serve as a tremendous resource with the ultimate goal of developing new prevention and treatment strategies for dogs with a variety of illnesses.

Service on National Committees, Editorships, and National Boards: VBS faculty members contribute extensively to a wide variety of professional services, such as grant reviews (NIH, USDA, and NSF), specialty board examination committees, executive boards of professional organizations, editorial boards for professional journals and journal editorship, and advisory panels, working groups, and boards of trustees. VBS faculty also participate in many departmental, college, and university administrative activities. A partial listing of these activities include:

EDITORSHIPS

- Mary Jo Burkhard Associate Editor, Current HIV Research (2001-present)
- Michael Lairmore Associate Editor, Retrovirology (2003-present)

EDITORIAL BOARD SERVICE

- Mary Jo Burkhard Editorial Board, Veterinary Clinical Pathology (2003-present)
- Charles Capen Editorial Board, Laboratory Investigation (1988-2006); Experimental and Toxicologic Pathology (1990-2005); Toxicology and Ecotoxicology News (TEN) (1993-present); Methods in Toxicology (1989-present);
- Patrick Green Editorial Board, Journal of Virology (1999-present); Retrovirology (2004-present)
- Robert Hamlin ECG Editor, Journal of the American Veterinary Medical Association (2000-present)
- Michael Lairmore Editorial Board, Virology (2001-present); Journal of Virology (2003-present)
- Judy Radin Editorial Board, Veterinary Clinical Pathology (2002-present)
- Laura Rush Editorial Board, Cancer Letters (2003-present); Veterinary Pathology (2005-present)

EXTRAMURAL STUDY SECTION AND REVIEW BOARD SERVICE

- Charles Brooks National Institutes of Health
- Mary Jo Burkhard American Cancer Society (2004-present), Natural Sciences and Engineering Research Council of Canada (2004), Burroughs Wellcome Foundation (2002-2003)
- Jim DeWille U.S. Army Breast Cancer Research Program (1998-2005)
- Patrick Green National Institutes of Health (2003-present), American Cancer Society (1999-2004)

- Robert Hamlin International Life Science Institute
- Mike Lairmore National Institutes of Health
- Cheryl London Morris Animal Foundation (2002-present)
- Larry Mathes National Institutes of Health (2005present)
- Mike Oglesbee National Institutes of Health
- Judy Radin National Institutes of Health (National Center for Research Resources), Central Ohio Diabetes Association
- Yasuko Rikihisa National Institutes of Health (1999-2003)
- Tom Rosol Morris Animal Foundation (2000-2003), Chairperson 2002; U.S. Army Medical Research and Materials (2001); National Institutes of Health (2001); National Institutes of Health, NCRR (2005)

LEADERSHIP IN EXTRAMURAL PROFESSIONAL ORGANIZATIONS AND SCHOLARLY SOCIETIES

- Charles Capen Chairman, Founding Accreditation Committee for International Academy of Toxicology Pathology (2000-2003)
- Patrick Green Board of Trustees, Ohio Chapter of Leukemia and Lymphoma Society (1999-2002)
- Nongnuch Inpanbutr President, American Association of Veterinary Anatomists (2002-2004)
- Judy Radin President American Society for Veterinary Clinical Pathology (2005)
- Tom Rosol ACVP Annual Meeting Program Chairperson (2002); ACVP Chairperson, Standing Education Committee (2003),
- Paul Stromberg Secretary/Treasurer, American College of Veterinary Pathology (2000-2005); Vice President/President, American College of Veterinary Pathology (2005); Board of Directors, Charles Louis Davis DVM Foundation
- Steve Weisbrode President, American College of Veterinary Pathology (2001)
- Maxey Wellman Chair, American College of Veterinary Clinical Pathology General and Certification Examination Committees (2005)

Note: Excluded are intramural (i.e. college) awards; services as a reviewer for journals; simple membership or committee service in extramural organizations (vs. chair or leadership position), and site visits.

Awards for Service Contributions: Faculty and staff members are routinely recognized for their outstanding service contributions (list in supplement materials). Selected examples include:

- **Department Staff Awards:** This award is designed to recognize staff members for outstanding contributions in job performance that lead to the completion of research, education, or service missions of the Department. This form serves as a nomination tool to recognize a staff member in the Department of Veterinary Biosciences for contributions and service that exceed expectations and warrant positive feedback. While there are no specific criteria for the award, the nomination should represent positive feedback on the performance of a regular or part-time staff member in the Department. The award is given at Department receptions, summer picnics, and

holiday parties. Twelve of these awards have been given out since 2003. Each award comes with a plaque and a \$100 gift card.

- The **William L. Ingalls Award** for exceptional *service* recognizes individuals who have provided exceptional service to the College. Recipients of the award have demonstrated continued dedication to the College and have had a sustained impact on its programs. The Department has had 2 recipients of this award since the year 2000 including Dr. Kate Hayes (2006) and Dr. Gary Kociba (2003).
- Dr. Gary Kociba was one of three ASVCP members who received an **ASVCP Lifetime Achievement Award** at ASVCP reception Dec. 5, 2005 during the annual ACVP meeting in Boston.
- Dr. Charles Capen was received an award for **Outstanding Contributions to Animal Clinical Chemistry**, American Association for Clinical Chemistry, Division of Animal Clinical Chemistry in 2004.
- Dr. Lynne Olson in 2006 was awarded the **Faculty Award for Distinguished University Service**, which recognizes up to three faculty members annually whose contributions to the development and implementation of university policies and programs through non-administrative roles have been extensive and have made clear and significant impact on the quality of the University.

Future Directions in Service: Important goals for the future include coordinating clinical services among all departments to improve the accessibility of the services, developing a business plan for the services, remodeling space and updating equipment, expanding the mouse phenotyping effort, establishing molecular pathology services, improving diagnostic services in the area of infectious disease, and encouraging faculty participation in local and national administrative and professional services. If accomplished, these goals will result in more efficient services, increased use of services, increased profitability of services, and an increased range of services. This will enhance the visibility of VBS and will increase contacts between VBS faculty and researchers within the university and at the national level.

VI. Outreach and Engagement

A. Relationship to Mission: In the Department, *outreach and engagement* is defined as meaningful and mutually beneficial collaborations with partners outside the academic community. Department partners in this mission include institutions and individuals in education, business, and public or social service. Faculty, staff, and student members engaged in outreach and engagement are recognized for their efforts and outcomes from these activities will enhance other missions of the Department and expand the impact of the faculty, staff, and students' contributions to the University and society.

B. Description, Integration, and Impact of Activities: Department faculty members, as well as staff and students partner with a variety of organizations or partners to provide outreach to the community, citizens of the State of Ohio, nationally, and internationally. Select examples include:

Dr. Nong Inpanbutr developed a unique cross disciplinary educational project for outreach and engagement of middle school students. She led the development of an interactive website entitled, “Do you want to be a Vet” <http://vet.osu.edu/BeAVet> . The project is described in detail in the Outreach and Engagement Section of this report. The project was collaborative with Banfield Corporation and OSU CARES, an extension program associated with 4 H. She worked closely with teachers in the Columbus Public School System in developing the program to meet State of Ohio standard requirements. This project involved the College information technology staff and resources to design, set up and host the site. Staff from the Office of Technology Enhanced Learning and Research (TELR) an OSU central resource for eLearning information assisted in the development of the interactive components of the program (Animal Game Parts). As a result, this program has been selected by both the Digital Union and the TELR office as a “Spotlight” collaborative project. The interactive presentation and high quality of this program serve as an engaging model that is thought stimulating, which will promote critical thinking skills in the students. Thus far, feedback from the majority of students who have used this program has been overwhelmingly positive. Furthermore, the mobility of this web-based approach, and the interactive use of the anatomy of the dog, a favorite pet, will provide wide access to information regarding careers in veterinary medicine to students around the state of Ohio, and eventually nationally and internationally.

Dr. Cheryl London provided two public lectures entitled “Cancer in dogs and cats: Advances in diagnosis and treatment”. These very popular lectures serve to bring local small animal owners information regarding the expanding array of diagnostic tests and clinical trial options for owners of animals suffering from cancer. Each lecture was attended by several hundred local residents following a public ad campaign.

As published in the Columbus Dispatch, a team of veterinary pathologists led by Dr. Steve Weisbrode and residents assisted in the necropsy of an elephant at the Columbus Zoo. Posted on Tue, Aug. 16, 2005. **Associated Press. COLUMBUS, Ohio** - A young male Asian elephant was found dead in his stall at the Columbus Zoo on Tuesday, officials said. - tentative diagnosis following a necropsy was that Ganesh died of a strain of herpesvirus that is specific to elephants.

Dr. Charles Brooks developed a new course educating undergraduate students in career opportunities in veterinary medicine.

Numerous faculty members serve as Science Fair Judges including Drs. Hamlin and Dewille.

Dr. Nong Inpanbutr developed an elective course for veterinary students in “Foreign Animal Study” Elective Course, VBS 693 with Chiang Mai University in Thailand

Additional examples are provided in the following table:

Project Title	Investigators	Goals
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Association for Women in Science of Central Ohio (AWISCO)	Boris-Lawrie	AWISCO - is the Central Ohio chapter of the Association for Women in Science dedicated to the advancement of equity, ethics and full participation of women in science, technology and medicine.
Graham School Internships	Boris-Lawrie	Graham School internships for high school students interested in science and technology. These have been for "disadvantaged" students.
OSU CCC publication	Boris-Lawrie	OSU Comprehensive Cancer Center publication of our work displayed to public the role of our retrovirus research as a model for understanding cancer genes
Roads Scholars Tour	Burkhard	On this annual two-day tour of Ohio, Ohio State faculty have an opportunity to see how their colleagues are engaged in teaching, research, service, and outreach within the community or region. In addition, faculty have the opportunity to network within the university and be exposed to members from different colleges, regional campuses, extension, and administration.
Who Wants to be Veterinarians/The Science of Your Dogs and You!	Inpanbutr	We will develop an interactive audiovisual with video stream web-based program consisting of two parts: A) anatomy of the dog and its body functions, and B) career as a veterinarian. This program will be disseminated by the 4-H extension office and the P-12 Program to schools in the Columbus area. http://pro.osu.edu/oe/activities/index.cfm?oid=1018
Your Dog-the Inside Story and Careers in Veterinary Medicine-Endless Possibilities	Inpanbutr	To educate middle and high school students about careers in veterinary medicine using an interactive, audiovisual, web-based program that is based on: a) basic anatomy of the dog and body functions, and b) opportunities for a career as a veterinarian http://pro.osu.edu/oe/activities/index.cfm?oid=1019
Science Fair Judge	Masty	Science Fair judge at St. Brendan Catholic Gradeschool. Grade Levels This Project is Offered For: Grade 5, Grade 6, Grade 7, Grade 8
Internet Consultant	Nagode	Serves as medical/professional consultant to internet user groups concerning renal failure and calcitriol Tx in animals
Veterinary Information Network	Nagode	Involved with the "Veterinary Information Network" comprising computer associated vets from all over world with several thousand members
Science Fair Judge	Radin	This project is a youth program. Grade 6, Grade 7, Grade 8. Outside Partners -Clintonville Academy
"Cancer Treatment is Going to the Dogs: Using Humans as a Model of Canine Cancer"	Rush	Seminar presented at Stone Labs 8/06
Executive Board, Friends of Stone Lab	Stromberg	Support (Volunteerism)

Stone Lab Research Experience for Undergraduate Students	Stromberg	Participates in fundraising for the Stone Lab Research Experience for Undergraduate Students
OSU College Veterinary Medicine/Rakuno Gakuen University Cooperative	Yamaguchi, Mamoru	The OSU College of Veterinary Medicine and the Rakuna Gakuen University, Ebetsu, Japan, have shared scholarly cooperations in faculty exchange and student clinical practice since 1988. Based on an agreement between the two institutions, the Mitsugi Satow-Rakuno Gakuen Scholastic Endowment Fund was established supporting various joint research programs in both basic and clinical sciences.

VII. Leadership

A. Planning and Organization: Policy and program decisions are made in a number of ways: by the department faculty as a whole, by standing or ad hoc committees of the department, or by the chair. The nature and importance of any individual matter determines how it is addressed. Department governance proceeds on the general principle that the more important the matter to be decided, the more widespread the agreement on a decision needs to be. Open discussions, both formal and informal, constitute the primary means of reaching consensus on decisions of central importance.

Chair's Duties and Responsibilities

- The Chair will lead the Department with integrity and by positive example. Leadership will be consistent with University rules and appropriate faculty governance policies. Specific responsibilities are as follows:
- To have general administrative responsibility for the Department program, subject to approval by the Dean of the College.
- To develop, in consultation with the Department faculty, a *Pattern of Department Administration* document containing policies and guidelines, which include criteria and procedures for making recommendations concerning appointments or dismissals, salary adjustments, promotions in rank, and matters affecting the tenure of the faculty member.
- To operate the business of the Department with efficiency and dispatch while complying with all University, State, and Federal laws, rules, and policies regarding financial or other appropriate areas of governance. The Chair should promote regular communication methods to distribute information to enhance the missions of the Department.
- To devise, plan and implement with faculty members of the Department and Dean of the College a strategic plan for future development of the Department to foster excellence in all missions of the Department.

- To monitor the instructional and administrative processes of the Department and direct adjustments and improvements as needed.
- To evaluate faculty members annually in accordance with criteria approved by the Board of Trustees and subject to instructions from the Executive Vice President and Provost, and also according to such supplemental criteria as defined by the Department.
- To recommend to the Dean of the College, after consultation with the faculty, all appointments, dismissals, promotions, salary adjustments, and matters affecting the tenure of members of the Department faculty.
- To encourage and promote the research, education, outreach, and service activities of the Department faculty.
- To ensure that all faculty members, regardless of their assigned location, are offered Department privileges and define faculty responsibilities and tasks appropriate to their rank. The Chair should carry out these duties in a manner that promotes a high level of morale and collegiality.
- To facilitate or provide adequate supervision and mentoring mechanisms are given to those members of the faculty, staff, and students who may profit by such assistance.
- To prepare, after appropriate consultation with faculty and staff advisory groups, annual budget recommendations for consideration by the Dean of the College. The Chair has ultimate responsibility for allocating the Department's resources in a way that makes the most fiscal and programmatic sense.
- To assure that all students who enroll in courses taught by Department faculty are offered the best possible academic experience, are treated with respect, and have a meaningful mechanism available to discuss their educational program and academic experience in the Department.
- To provide leadership in working toward a positive climate within the Department. A positive climate is one in which 1) civility and mutual respect characterize interactions among faculty, staff and students; 2) evaluations are based on performance; 3) diversity is valued; and 4) persons refrain from jokes, innuendos, and other forms of discourse whose purpose or effect is to humiliate or degrade others. The Chair will be proactive in addressing any evidence of behavior contrary to the above.

- To create and maintain on the Internet a web page for the Department of Veterinary Biosciences that will contain the current *Pattern of Department Administration*, *Strategic Plan for the Department*, an updated listing of faculty membership on Department, College, and University committees, and other appropriate information.

B. Committees and Operational Procedures

Faculty Committees: Faculty committees shall include standing and *ad hoc* committees. The committee membership and charge of the committees will be announced to the faculty, unless the charge relates to confidential issues e.g., scientific misconduct. Unless otherwise indicated, all committees shall advise the Chair in areas of their purview following consultation with appropriate sources, including student groups. Standing committees are those, which by the continuity of their activities are important to the effective function of the Department. Each standing committee will be encouraged to develop standard procedures of operation, which will be distributed to all faculty members. The standing committees shall be the Faculty Advisory Committee (FAC), the Graduate Studies Committee (GSC), Excellence in Education (ExE) and the Department Promotion and Tenure Committee (DPTC). Formation of *ad hoc* committees will be utilized to address focused issues requiring faculty input in specific areas. The Chair with input from faculty members involved will select the committee members and appoint the Chairs of all *ad hoc* committees. Examples of *ad hoc* committees include those for faculty searches, quality of life, development, faculty mentoring, computer, capital equipment, special events, core services, etc. Unless otherwise indicated, any regular faculty member is eligible to serve on Department standing or *ad hoc* committees. Auxiliary, courtesy, or emeritus faculty, staff, and students may be appointed to *ad hoc* committees at the discretion of the Chair. All committees are encouraged to call upon faculty, staff, students, and administrators who have special expertise on matters under consideration for their ideas or perspective.

Faculty Advisory Committee (FAC): The FAC, as a representative body of the regular faculty, will serve as an advisory group to the Chair regarding matters of Department business and other issues. The FAC will be composed of five faculty members elected by ballot vote of all regular faculty members to serve three-year terms. In following election years, each eligible voting faculty member will cast ballots for the number of vacant three-year terms open that year. FAC chairs will be elected at the first meeting of the FAC after July 1st. The term as chair will be limited to the remaining year(s) of their current three-year term. FAC members including the chair may serve more than one term. Nominations for all eligible seats on the FAC usually will be solicited during the Spring Quarter Department faculty meeting, eligible faculty will cast votes, and the elections will be concluded so that terms of office can begin July 1st.

Among its responsibilities, the FAC will serve in an advisory and consulting role regarding budget recommendations, assignment of Department resources and support services, prioritization of Regents' equipment requests, awarding of research leaves, and appointment procedures for regular and auxiliary faculty. The FAC will act as an advisory committee to the Chair for selection or election of faculty members to Departmental, College, and University committees. The FAC also may be requested by the Dean to assist in the formulation of procedures for review and/or appointment of the Chair.

The FAC meets periodically with the Chair as needed to discuss issues or gain administrative perspective of issues, but can meet without the Chair present. The Department Chair and the FAC chair (in consultation with the FAC membership) will together determine the issues to be addressed and set the meeting date and time. FAC meetings are open to all Regular Department Faculty and attending faculty may participate in the discussions. Agenda items will be circulated to all members of the Department faculty at least one week in advance of the FAC meeting. The FAC Chair or a designated member will keep minutes of each meeting. These minutes will be reviewed, amended if needed, and approved in a timely manner before distribution (e.g., within 2 weeks of the meeting) to all regular faculty. The FAC may conduct some business matters via email or by telephone to expedite decisions or gain the opinions of members who can not come to a face-to-face meeting. Any business conducted electronically or by telephone will also be included in minutes and distributed to the entire faculty. Matters of a highly personal nature will not be distributed as part of the minutes but will be kept as part of the permanent committee record.

Graduate Studies Committee (GSC): The GSC monitors graduate faculty membership status and serves as the administrative unit of the graduate faculty for all matters pertaining to the graduate and residency programs in the Department of Veterinary Biosciences including student admission, transfer, policy matters related to the graduate school or program, and fee waiver issues. The GSC will be composed of five elected graduate faculty members (categories M and P) and one elected graduate student from the Department of Veterinary Biosciences. The Graduate School defines what the GSC is authorized to administer. The reader is referred to the *OSU Graduate School Handbook* for a more detailed listing. Summary reports of actions taken by the GSC will be communicated at Department faculty meetings and are subject to approval, modification, or reversal by a majority vote of all the voting graduate faculty members in the academic unit. GSC issues, other than admission, must be approved by at least four positive or negative votes (six member committee). Tie vote issues will be brought to the entire Veterinary Biosciences graduate faculty. Any member may request that an issue be brought to the attention of the entire graduate faculty. Supplemental policies and responsibilities pertaining to this Department; rules for admission to the Veterinary Biosciences graduate faculty; and policies and guidelines on the composition, nomination to and election procedures for membership to the GSC are found in the most recently revised *Graduate Program Handbook of the Department of Veterinary Biosciences*. A summary from that document includes procedures to elect the GSC Chair by eligible graduate faculty during a Department faculty meeting and term of this office (i.e., 3 years, renewable, and normally begins July 1st). Four other graduate faculty members will be elected to serve two-year terms on the GSC. The graduate students of the Department will elect the graduate student who serves as a voting member of the GSC.

Excellence in Education Committee (ExE): The Excellence in Education Committee is composed of teaching team leaders, interested faculty significantly involved in the education mission of the Department, staff, and student representatives. The Committee has no set number or terms, but generally will be reformed to allow interested members to join and remain an effective group. The Committee meets approximately every 6 weeks or as needed for specific projects. Their mission is to implement those aspects of the Department's

Strategic Plan related to education with concentration on the professional veterinary curriculum. The Committee serves to develop educational forums that promote improvements in teaching methods, exchange of course materials between faculty, development of specific teaching incentive plans, etc. The Committee serves as an advisory committee to the Chair to discuss and prioritize the education initiatives of the strategic plan. Included in their charge are projects such as: methods to promote communication of best practices in teaching and evaluation of teaching, work with the College Educational Resources Office to promote new methods of teaching including continued use of current technology to enhance the deliver of education to students and for faculty enrichment to promote excellence in teaching. The Committee also seeks ways to suggest reward or incentive mechanisms for outstanding teaching and promote the acquisition of appropriate infrastructure to improve the classroom or instructional materials. The Committee promotes methods to enhance communication, both within the department and the college, to promote a shared understanding of education mission, as well as a shared understanding of the resources necessary to meet the education mission of the department and college and promote both collegial interactions.

Department Promotion and Tenure Committee (DPTC): The DPTC is composed of all regular faculty members with the rank of Professor with primary appointments in the Department. However, composition of the DPTC will be enlarged to include tenured associate professors with primary appointments in the Department when considering probationary faculty for promotion to rank of Associate Professor with tenure, for fourth-year reviews, and for special reviews of probationary faculty. The members of the DPTC will agree to abide by the policies and procedures in this document. Excluded from the committee for purposes of discussion and voting on candidates for promotion and tenure, promotion, and fourth-year review are: College or University administrators with academic appointments in the Department; the candidate's dissertation chair; and faculty who are related to the candidate by means of family, business activities external to the University, or in some other capacity that they feel will prevent them from being objective in their decision. The Department Chair is excluded from voting only. One member of the committee at the rank of Professor is elected by simple majority of the committee as Chair of the DPTC for a term of 3 years. One member of the committee at the rank of Professor will be elected by the membership to serve for the academic year as the Procedures Oversight Designee (POD). He/she will be responsible for assuring that reviews for all faculty members are procedurally correct, fair, based on performance, and free of bias against under-represented groups. More detailed policies and guidelines of the DPTC are located in this *Pattern of Department Administration* document.

C. Communication and Participation

Faculty Meetings: The Chair schedules a Department faculty meeting a minimum of once every quarter. Date, time, and agenda of the meeting will be announced in writing at least one week in advance. Faculty forums or additional Department faculty meetings may be convened as needed by the Chair or by faculty through a written request (at least three regular faculty signatures required). Minutes of each faculty meeting, including a list of those faculty present, will be recorded by a designee of the Chair and will be circulated for approval in advance of the next meeting. The approved minutes, along with pertinent documents

introduced during the meeting, will be kept in the Department Office as a permanent record. Policy matters pertaining to Department operation shall be discussed in faculty meetings and approved by a majority vote provided a quorum (50% of regular faculty) is present. Should less than 50% of the eligible faculty be present, the issue will be settled by a ballot vote of all regular faculty. Voting rights are restricted to regular Department faculty only (50% or greater appointment). The rules contained in *Roberts Pocket Manual of Rules and Order* shall determine the parliamentary practice of meetings in which voting is conducted on substantive matters. Approved policies will be appended to this *Pattern of Administration* document. PDFs of each powerpoint presentation by the Chair is mailed to all faculty, staff, and students. Annual "State of the Department" summaries are provided in the winter quarter of each year (supplemental materials). The current address is posted on the website as a PDF <http://www.vet.ohio-state.edu/biosciences.htm>

Monthly Newsletter, E-mail Announcements, and Website: A monthly newsletter is provided electronically to all faculty, staff, and students. This newsletter called "BIOS-The Life of the Department of Veterinary Biosciences" summarizes recent grants, staff hires, etc. It is also sent to friends, alumni, and leaders in the College and beyond. In addition, under the banner of the department chair, key announcements are provided electronically. The Department website contains an active "News" section to post newsletters, and other items of a topical nature. <http://www.vet.ohio-state.edu/biosciences.htm>

C. Professional/Leadership Development: (Covered in Faculty Section above)

VIII. Staff

A. Organization and Integration to Mission: The organization of the Department is designed to offer administrative and core services to assist in accomplishing the academic missions of the Department. The administrative staff is organized to provide fiscal and logistic management of the Department for such services as: purchasing of goods and services, grants management, travel arrangements, general secretarial needs, educational services, and human resources support (*described in Patterns of Administration revised Oct. 2007*).

Graduate program staff members assist in organization of Graduate Studies Committee meetings, maintaining student records, recruitment activities, and immigration related activities. Graduate records of the department have been centralized and an inquiry system has been established to provide information to prospective graduate students. Information for prospective graduate student applicants is provided by phone, e-mail, and mailings of brochures. A Graduate Studies Program website (<http://www.vet.ohio-state.edu/gradProgs.htm>) is available to facilitate graduate student recruitment. The website includes faculty profiles, general community information, admissions and financial information, and fellowship announcements. The Department offers a Graduate Program Handbook for all entering graduate students. Students supported by Department funds are encouraged to rotate among laboratories that have active research support. Incoming students are provided a list of currently available research laboratories along with descriptions of the field of research.

Core services groups are supported in the Department in the areas of pathology, clinical pathology, imaging, immunohistochemistry/histology/mouse phenotyping, and

molecular biology. These core groups are designed to manage resources effectively and provide coordinated approaches to core services that assist in the research, education, and service missions (details of administrative operations below). The Department provides staff members to support diagnostic laboratory services on a fee for service basis to the OSU Veterinary Teaching Hospital (VTH), all departments within the college, other departments within the university, the university laboratory animal program (ULAR), the Columbus Zoo, private veterinary reference laboratories, private practitioners, other colleges of veterinary medicine, and investigators from other institutions. In addition to diagnostic services, the clinical laboratories provide valuable case material for teaching veterinary medical students and preparing residents for specialty board certification in veterinary pathology, clinical pathology, internal medicine, and surgery.

Staff members are assigned to maintain buildings and provide support services for faculty and students. Building coordinators are assigned duties related to infrastructure support and to serve as a liaison with OSU Physical Facilities and Environmental Health and Safety Offices to report maintenance problems and plan routine upgrades to equipment or other infrastructure needs. The building coordinator and assigned staff members develop plans for compliance with biohazardous waste policies, evacuation plans for buildings, and provide basic support services to core service groups, and research and teaching laboratories.

The Department of Veterinary Biosciences' core services groups are designed to:

- Manage resources effectively and provide coordinated approaches to core services that assist in the research, education, and service missions;
- Support diagnostic laboratory services to the Veterinary Teaching Hospital, and throughout the University, State of Ohio and nationally;
- Provide valuable case material for teaching veterinary medical students and preparing residents for specialty board certifications;
- Be fiscally responsible by providing clear plans of operation that are academically driven, but budget sensitive;
- Operationally independent, but fully integrated into the missions of the department;
- Be supervised by a faculty director that develops policies of services and collects operational data; and
- Encourage opportunities to improve or expand the state-of-art technology that furthers the research, education, or service missions of the Department

Technical support services: Technical support services include salaried staff positions to support core services for the faculty, including technicians in core service groups and research technicians. Decisions to support research technicians are made by the Chairperson in context to faculty recruitment goals, department needs, and available resources. The Chairperson consults appropriate faculty committees (e.g., Core Service Committee) to determine the best use of departmental supported technical positions.

Administrative and secretarial services: Administrative and secretarial services are accessible to all faculty, staff and graduate students. Human resource staff members provide assistance in payroll, tax information, posting and hiring of faculty and staff positions, and all

other matters related to human resource management. Secretarial personnel provide assistance with word processing, faxing, copying, scheduling and other communication assistance. Business office support services provided by the department include the following: processing requisitions for supplies, services and equipment, travel arrangements and reimbursements, and special fiscal reporting services; and personnel actions that include processing monthly appointments, hourly payrolls and benefits.

Department assistance: Department assistance to principal investigators with sponsored research is available. This includes faculty seeking or managing sponsor funded projects, working closely with the Ohio State University Research Foundation (OSURF). Business office support services include the following: processing requisitions for supplies, services and equipment, travel arrangements and reimbursements, fiscal assistance that provides monthly balances on all separately funded research projects, grants or other accounts; budget preparation and special fiscal reporting services; and personnel actions that include processing monthly appointments, hourly payrolls and benefits. Complete information on OSURF and other grants management policies can be found at: <http://www1.rf.ohio-state.edu/paq/index.htm>

Technical and Environmental Health and Safety Support: The Department provides salaried staff positions to support core services and to promote environmental health and safety for the faculty, staff, and students. These include technicians in core service groups and research technicians. Decisions to support research technicians are made by the Chair in context to faculty recruitment goals, department needs, and available resources. The Chair shall consult appropriate faculty committees (e.g., Core Service Committee) to determine the best use of Department supported technical positions. Staff members will be trained to encourage and promote environmental health and safety in the Department including promotion of occupational safety to encourage a safe working environment and comply with University and State of Ohio requirements for occupational and environmental safety in the workplace.

Grants Support: VBS Grant Support Office Services: This service was created in the VBS Department to support the research mission. A staff member was hired into the position in 2004 and subsequently promoted into the College Office of Research. The services offered include:

- Publishes the "VBS Grant Support Office Newsletter"
- Provides timely information on news and updates pertinent to researchers
- Summarizes common grant deadlines and eligibility requirements
- Provides updated guidelines and Forms
- Supports Grant and Proposal Submissions
- Assists with boiler plating – Face Page, Resources, Biographical Sketches, etc.
- Provides scientific editing and proofreading of proposals, manuscripts or other scientific documents
- Assists with grant/manuscript presentation – formatting and layout
- Helps coordinate off-campus form (PA005)
- Assists investigators with grants management via PI Portal, provides training and consultation

B. Career Development and Mentor: The Department supports a variety of initiatives to foster the career development of staff members including flex hours, human resource workshops, financial planning courses, tuition assistances for courses, family leave policies, etc. Funds are provided from development and release time accounts to off set costs associated with staff development.

C. Work and Life Issues: A Quality of Life Department Committee was formed in 2005 and includes staff, students, and faculty. The committee is described in previous sections.

IX. Infrastructure

A. Assignment of Resources and Support Services: The Department of Veterinary Biosciences has an obligation to effectively use its resources and support services to fulfill its mission of education, research and service. It is the responsibility of the Department Chair, after appropriate consultation with the FAC, to equitably and fairly distribute Department services and resources. The items listed below are not intended to be exhaustive but to provide examples of Department resources and support services that facilitate faculty teaching, research or service programs.

Research Space Assignments

Statement of Policy: Faculty members of the Department shall be assigned research space according to the needs of their research program, and the availability of research space. It is the responsibility of the Department Chair to negotiate research space with each faculty member and to accommodate the needs of research programs of those faculty members according to the guidelines established by Department and college mission statements and administrative policies. The Dean of the College has the ultimate responsibility for the administration of all college space and shall accommodate Department and faculty research needs as resources permit.

Definition of Research Space: Department research space, defined by OSU policies of space inventory, is obtained by negotiation between the Dean and the Chair. The Chair of the Department, governed by Department Pattern of Administration, administers Department space and the Dean regularly assesses its efficient use. The Dean shall supervise new research space (as defined by the OSU Facilities Planning Office) added through construction, and this space shall be designated as College space until it is assigned to an academic department for a specific faculty member and/or for a specific research program. During this assignment, that research space shall be designated as Department space and shall be administered by the Department according to its pattern of administration.

Research Space Assignment and Reassignment: The primary responsibility for assignment of Department research space to individual faculty or research programs rests with the Department Chair. The Chair will consult with the Faculty Advisory Committee and other appropriate *ad hoc* infrastructure committees when conflicts occur over space assignments. If the Department Chair cannot resolve Department research space needs within Department resources because of insufficient space, or if space needs of faculty

cannot be accommodated, the Department Chair may negotiate with the Dean for additional space. The Dean, in turn, shall seek recommendations from the Council for Research or designated Research Committees for resolution of Department research space needs.

Criteria for Assignment or Reassignment of Department Research Space

- The Department Chair in making decisions of research space assignments shall use the following ranked priorities for use of research space:
- Department tenure-track faculty approved by the OSU Office of Research funded as principal investigators by multiyear extramural research support funds that provide monies for the full indirect costs of the project. Full indirect costs are defined as the current negotiated rate by OSURF for conventional research projects and clinical research projects.
- Newly hired Department tenure-track faculty approved by the OSU Office of Research who have substantial research time commitments outlined in their letter of offer and who are supported by Department start up packages compatible with this research commitment.
- Department tenure-track faculty approved by the OSU Office of Research funded as principal investigators by multiyear extramural research support funds, which provide monies for partial payment of the indirect costs of the project.
- Department tenure-track faculty approved by the OSU Office of Research funded as principal investigators by internal research support funds wherein indirect costs are not provided by the grant award.
- Department tenure-track faculty approved by the OSU Office of Research formerly funded as principal investigators by external research support grants and who are actively seeking renewal funding or new research grant support. It is anticipated that these faculty will provide the Chair or Faculty Advisory Committee with materials (copies of grant proposals, critiques, etc) that document this effort.
- Department tenure-track faculty approved by the OSU Office of Research funded as principal investigators by internal research support grants that are actively seeking renewal funding or new research grant support. It is anticipated that these faculty will provide the Chair or Faculty Advisory Committee with materials (copies of grant proposals, critiques, etc) that document this effort.

Criteria for Reduction or Loss of Assigned Research Space

- Because of the limited availability of Department and college research space, its utilization will be reviewed and justified regularly at the time of annual faculty and staff reviews in accordance with strategic research plans and unsatisfied space needs. When research space is available to accommodate funded research programs, non-

funded faculty shall be given ample opportunity to develop further funding for his or her research program to continue. Therefore, Department considerations for research space re-assignment should be based also upon documentation of the occupant's research plans and probabilities of success in developing research funding. Whenever possible, a period of two non-funded years shall be granted to the faculty member. In this case, documentation of progress by the non-funded faculty member to obtain extramural research funding must be sustained. Research space may be shared with other faculty or re-assigned to other faculty members as recommended by the Department Chair or, if necessary, by the Dean.

Office Space Assignments: The Department Chair will assign faculty, staff, and student office space as appropriate for job title and duties. In making the assignments all efforts will be made by the Chair to place office space in convenient locations and be of sufficient size and appropriately configured to accommodate the activities of the faculty, staff, or student. Regular faculty will be given office space priority. When available emeritus and adjunct faculty may be assigned office space. Other factors that will be considered in making the decision of the Chair on office assignments include, but are not limited to, job productivity, years of service, job title or rank, location in relationship to research, teaching, or service laboratories, enhancement of programmatic synergy, and recruitment priorities.

Core Service Groups: The Department supports core services in pathology, clinical pathology, imaging, immunohistochemistry/histology/mouse phenotyping, and molecular biology. The Chair based upon their expertise and willingness to serve selects core directors from tenured regular faculty. These core groups are designed to manage resources effectively and provide coordinated approaches to core services that assist in the research, education, and service missions. These cores have developed fiscally responsible and efficient written plans of operation that are academically driven, but budget sensitive. The cores are designed to be operationally independent, but fully integrated into the missions of the Department. The faculty director of each of the core services develops policies of services and collects operational data. These data will be used in financial decisions related to Department resources. Infrastructure plans for each core (e.g., renovations, space utilization) for the service laboratories are to be prioritized in context to overall Department infrastructure. Each core will take advantage of and encourage opportunities to improve or expand the state-of-art technology that furthers the research, education, or service missions of the Department, provide website descriptions that outline the services and fees and present annual updates to the Chair and faculty of operational data. These laboratories, to recover costs of personnel and supplies, may assess user charges.

Administrative and Secretarial Services: Administrative and secretarial services will be accessible to all faculty, staff, and graduate students. Secretarial personnel provide assistance with word processing, faxing, copying, scheduling, and other communication assistance. Business office support services provided by the Department include: processing of requisitions for supplies, services and equipment, travel arrangements and reimbursements, fiscal assistance that provides monthly balances on all separately funded research projects, grants or other accounts; budget preparation and special fiscal reporting

services; and personnel actions that include processing monthly appointments, hourly payrolls, and benefits.

Laboratory Support: Central glassware preparation and laboratory support services benefit graduate research and teaching programs in the Department. Among the services provided by this centralized operation are: decontaminating, washing, checking, sterilizing and restocking of glassware and plastic ware, inventory and dispensing of laboratory chemicals and controlled drugs, sorting and dispensing of laundry, preparation of fixatives, maintaining supplies of liquid nitrogen, dry ice, cylinder gases, receiving and delivering of supply orders and equipment, inventory of capital equipment, stocking office materials, communicating and expediting building service requests, facilitating compliance with OSHA and fire and safety codes, and monitoring preventive maintenance contracts for shared-use equipment and annual biohazard hood certifications. A cost-sharing recovery system is associated with the central glassware and laboratory support service.

Facilities: Research in the College of Veterinary Medicine is principally conducted in four major buildings; Goss Laboratory, Sisson Hall (contains a fully AALAC accredited vivarium for large and small animals), Veterinary Academic Building (VMAB), and the Veterinary Teaching Hospital (also contains a fully AALAC accredited vivarium for large and small animals). Goss Laboratory was designed specifically for research in experimental pathobiology. It contains 38,135 sq. ft. of research space, including specially designed rooms for maintaining experimental animals used in biomedical research and the handling of toxic fumes and chemicals, radioactive materials, and hazardous infectious agents. The general arrangement in Goss Laboratory is that of a central core of supporting facilities surrounded horizontally and vertically by research laboratories. The central facilities include a central cage washing, glassware washing and sterilizing area, isolation necropsy room, incinerator, central still and storage tank, and constant temperature rooms. There is a manifold air and vacuum system for the germ-free life laboratories and a large capacity central still and storage tank along with generators to produce steam from distilled water for autoclaves in the infectious disease and tissue culture laboratories. The College of Veterinary Medicine maintains hematology, clinical chemistry and microbiology laboratories available on a per fee basis. These laboratories operate under BSL-2 Biosafety conditions and active accounts are maintained with them. Animals will be held in containment facilities in the Veterinary Hospital vivarium under the control of the Central Laboratory Animal Resources Center, which includes a full time veterinarian. The facility conforms to BSL-2 standards as described in H1H #75-790, NCI Safety Standards for Research Involving Oncogenic Viruses and is certified through the AALAC. All laboratory animal care and use conformed to regulations and procedures in the NIH approved Guide for the Care and Use of Laboratory Animals. The College has been actively engaged in the support of quality research and educational facilities during the past decade, in parallel to efforts of the Department of Veterinary Biosciences to support PHS-funded research. These efforts included the construction of Virology and Molecular Virology Laboratories and Laboratory Animal Facility (Sisson Hall Annex, \$7.1 million) in 1987 and the recently completed Veterinary Medical Academic Building (VMAB) (\$32 million from State of Ohio and College development monies). The Veterinary Medical Academic Building, newly opened in January 2002, is a four-story structure with a full basement. The first floor of the building houses two large 150-

seat classrooms at the wings, which are designed for the teaching of histology, the structure and function of cells, and for microbiology and parasitology. The second floor contains a comprehensive library, with an extensive array of scientific journals available in digital format on-line. A computer-teaching laboratory also is housed on the second floor. Another feature of the second floor is a number of small group learning rooms available for research laboratory meetings. The third and fourth floors of the building provide shared laboratory space for state of the art research. A total of 24 large laboratories and 12 small laboratories are designed around six community rooms that house specialized shared instruments. The remaining portions of the third and fourth floors are composed of faculty and staff offices. Faculty from all departments will utilize these spaces based on a research space policy favoring funded investigators.

B. Additional Support Services

Central glassware preparation and laboratory support services benefit graduate research and teaching programs in the department. They include the following:

- Decontaminating, washing, checking, sterilizing and restocking of glassware and plastic ware
- Inventory and dispensing of laboratory chemicals and controlled drugs
- Sorting and dispensing of laundry, preparation of fixatives
- Maintaining supplies of liquid nitrogen, dry ice, cylinder gases
- Receiving and delivering of supply orders and equipment
- Inventory of capital equipment
- Stocking office materials
- Communicating and expediting building service requests
- Facilitating compliance with OSHA and fire and safety codes
- Monitoring preventive maintenance contracts for shared-use equipment and annual biohazard hood certifications.

A cost-sharing recovery system is associated with the central glassware and laboratory support service.

C. Planning for the Future: A master plan has been completed by the College and includes long term plans for facilities associated with the Department. Key renovation projects are ongoing to renovate laboratories and build out shelled space in the VMAB building to create new laboratories. The priority of renovations and building plans is in context to budget constraints and is performed in context to overall strategic planning efforts. A list of projects, equipment purchases, and floor plans will be provided at the site visit.