

APPROVED BY SENATE

10/10/2016



Proposal to the Senate Educational Policy Committee

PROPOSAL TITLE:

Proposal to unify all College of Veterinary Medicine PhD programs into a single doctoral program named “Comparative Biomedical Sciences”, and eliminate the existing PhD degrees

SPONSORS:

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COLLEGE CONTACTS:

Philip Solter, College of Veterinary Medicine Graduate Program Restructuring Committee, Department of Pathobiology, 244-6106, psolter@illinois.edu.

BRIEF DESCRIPTION:

The College of Veterinary Medicine (CVM) proposes to restructure its doctoral education program by uniting the three CVM departmental PhD training programs into a single program. The unified program will be administered by a college level steering committee rather than at the department level, but each department will continue to offer individual MS programs as is currently done. The PhD curriculum will be supported by graduate courses taught by faculty in all three CVM departments, courses already available on campus as well as new CVM courses developed specifically to reflect the interactive nature of this restructured program. Prerequisites for admission will include either a Bachelor of Science (BS) or Master of Science (MS) in one of the STEM sciences or equivalent, a Doctor of Veterinary Medicine (DVM) or equivalent, a Doctor of Medicine (MD) degree or equivalent, or co-enrollment in the CVM professional veterinary or College of Medicine programs. The CVM has ongoing Residency/PhD and combined DVM/PhD degree programs that will be integrated into this restructured doctoral program. The program will strive to identify and recruit doctoral students from underrepresented minorities.

In keeping with its diversified training missions, the CVM faculty possesses a combination of basic and clinical research expertise across a broad range of biomedical disciplines that constitutes the academic core of a comprehensive doctoral program in comparative biomedical sciences (CBMS). The

proposed CBMS program will complement and enhance inter-disciplinary campus strategic initiatives and will synergize with other programmatic training opportunities on campus.

JUSTIFICATION:

The proposed doctoral program will identify the fundamental links between basic, translational and clinical research efforts to improve medical care across all species, and will be positioned to connect with important campus initiatives in the biological and biomedical sciences. The proposed name of the restructured doctoral program, Comparative Biomedical Sciences (CBMS), mirrors this vision and was selected to reflect the new capabilities afforded by the combined faculty to educate doctoral students who realize the ideas expressed by “One Medicine”, which addresses the commonalities of disease mechanisms, prevention and therapy between humans and other animals. The curriculum will collectively ensure the delivery of a broad-based learning experience to doctoral candidates and knowledge in the fundamental disciplines that form the foundation of the biomedical sciences. The program will also encourage the development of new courses that add value to the campus curriculum by teaching translational skills important to biomedical research. See Table 1 for a description of the potential advantages of the combined PhD program.

Table 1. Description and perceived advantages of restructuring CVM doctoral training

Current CVM doctoral program structure	Restructured CVM doctoral program
Doctoral programs administered at the department level with advisory committees consisting principally of department faculty.	Single college-wide doctoral program administered at the college level by a committee consisting of faculty from all CVM departments.
Division of faculty roughly into basic, translational and clinical research based on department affiliation.	Enhanced faculty interactions between basic, translational and clinical research.
Doctoral student interactions confined largely to home department.	Enhanced opportunities for doctoral students to interact with PhD students across the college.
Separate recruitment of doctoral students by each department along lines of interest.	Coordinated recruitment of doctoral students throughout the CVM.
Student-faculty research interactions occur primarily within departments.	Enhanced collaborative interactions between CVM faculty and cross disciplinary learning for doctoral students.
Training grant applications developed by department faculty.	College support for larger training grant applications.

Goals of the restructured program will be to ensure the continued excellence and advancement of CVM research programs, doctoral students and faculty. It is anticipated that, as an academic program for one of the nation’s major public research universities, the proposed CBMS doctoral program will attract doctoral students and faculty of the highest caliber and will achieve national stature. The aims of the new curriculum include:

- Ensuring a uniformly rigorous didactic standard across the CBMS program.
- Expose students to the use of comparative animal models to investigate biological mechanisms of health and disease.
- Provide each student with outstanding research training in the biomedical sciences.
- Teaching the molecular and cellular bases of health and disease.

Additional important goals will be to increase the total number of CVM PhD students, and to increase the racial and ethnic diversity of the CVM doctoral faculty and student body through new faculty hires and a diversity-conscious application system. The CVM is dedicated to enhancing diversity, and describes in its 2015-2020 Strategic Plan section 4.b.v. that the CVM will “Develop a diversity plan that includes active recruitment strategies, outreach plans, and a funding component”.

The CVM is already engaged in recruiting key faculty in many professional and research disciplines essential to comprehensive training in comparative biomedical sciences, who will contribute to one or more major areas of current faculty research strengths, including but not limited to:

- Cancer & Stem Cell Biology, Diagnostics & Therapeutics
- Environmental & Ecological Toxicology
- Infectious Disease
- Reproductive Health & Disease

The primary rationale for combining the CVM departmental PhD programs into a single, college-wide program is to provide the University of Illinois with a world-class comprehensive comparative biomedical doctoral training program. By promoting comparative biomedical research opportunities, this combined program will provide enhanced opportunities for campus-wide research collaborations, which will increase our competitive research profile and improve our ability to recruit the best and brightest faculty and students. The proposed program offers a unique opportunity to meet the global mission of the University of Illinois. See the Statement for Programs of Study Catalog for further details. The restructured program will accept new doctoral students annually with student admission increasing as the number of CVM research faculty grows. Cumulative grades and Graduate Records Examination (GRE) scores of applicants will both be considered, as will letters of recommendation and personal interviews.

Students will begin their coursework immediately upon entering the program. During the first year, the students will have the opportunity to take a laboratory rotation course, and by the end of their second year will have completed the majority of their graduate coursework. This will allow the students to identify a laboratory and research topic, and begin working on their doctoral research at the earliest possible time in the program. See Tables 2 and 3 for a comparison of the coursework and other requirements between the proposed and current PhD programs.

Table 2. List of courses and credit hours required to be taken by all PhD students enrolled in one of the three current CVM PhD programs (CB, PATH, or VCM) and the courses that will be required in the unified program.

Required Courses*	Course Hours			
	Unified	CB	PATH	VCM
Ethics in Research	1			
Grantsmanship & Scientific Writing	2			
Laboratory Rotation	0 or 2			
Biostatistics or epidemiology	4	4	4	4
Journal clubs and Seminar Series	6	4 to 6	2	2
Selection of one from Molecular and Cellular Biology (MCB): MCB 450, 354, 401, 402, 410, 480, or 501		4		
Selection of one: Biochemistry 350, 352, or 353				3 to 4
Electives and Thesis Research	81 to 83	82 to 84	90	87 to 86
Total Hours	96	96	96	96

*The courses now required by only one department (Biochemistry and MCB rubrics) will be changed in the unified curriculum to electives. Each student will have the option to take these courses as electives if recommended by his or her advisory committee.

Table 3. Comparison of requirements of unified PhD program to current PhD programs.

Requirements	Revised	CB	PATH	VCM
Minimum GPA	3.0	3.0	3.0	3.0
GRE required	Yes	Yes	Yes	Yes
Masters Degree Required for Admission	No	No	No	No
Stage I or Qualifying exam required	Yes	Yes	Yes	No
Stage II or Preliminary exam required	Yes	Yes	Yes	Yes
Dissertation defense required	Yes	Yes	Yes	Yes
Dissertation deposit required	Yes	Yes	Yes	Yes

The public and private need for scientists who understand and can translate biomedical research into new therapies and diagnostics is great. The CVM will address this need by offering a valuable training experience and degree. Individuals interested in careers as clinician scientists will be especially attracted to this restructured program to complement their DVM, MD, and specialty medical training.

BUDGETARY AND STAFF IMPLICATIONS:

a. Additional staff and dollars needed:

To address deficiencies in expertise within specific areas of program research emphasis, to assure appropriate programmatic and monetary support for basic and translational research, and to expand the number of doctoral positions that can be offered, additional faculty FTEs focusing on research will be required. In response to the anticipated needs of this restructured doctoral program, in the summer of 2013 the CVM administration and departments developed a 7-year hiring plan. The plan calls for additional research-focused faculty to bolster basic science discoveries, as well as additional clinician scientists to provide research-centric training opportunities in translational medicine. New faculty recruitment to support this program has already begun, and is being used to enhance CVM research excellence that will support a ‘critical mass’ of incoming PhD students

each year, and develop a nationally recognized comparative biomedicine doctoral program able to engage with campus biomedical initiatives and missions. The CVM Strategic Plan goals includes the development of a diversity plan with active recruitment strategies. The increase in research-focused faculty capacity will provide us the opportunity to achieve this goal.

- b. Internal reallocations (e.g., change in class size, teaching loads, student-faculty ratio, etc.):

The restructured doctoral program will consolidate the current members of the CVM graduate faculty that have the resources to support and train doctoral students. A Program Administrative Assistant (PAA) will be hired, and the position funded using a combination of college (50% of salary) and departmental (50%) accounts. The PAA will oversee the day-to-day administrative operations of the doctoral program.

- c. Effect on course enrollment in other units and explanations of discussions with representatives of those departments:

Since this is a consolidation of the CVM doctoral programs, the effect on course enrollment in other units should be similar to that occurring currently.

- d. Impact on the University Library (*A letter of acknowledgement from the University Librarian must be included for all new program proposals.*):

Since this is a consolidation of existing programs there will not be any significant change in impact on the University Library.

- e. Impact on computer use, laboratory use, equipment, etc.:

Since computer, laboratory, and equipment use will be supplied by the supporting faculty and their departments, there is unlikely to be an impact on these resources imposed by this restructured program.

DESIRED EFFECTIVE DATE: August 2017.

STATEMENT FOR PROGRAMS OF STUDY CATALOG:

Major: Comparative Biomedical Sciences

Degrees Offered: PhD

Joint Degree Programs

Veterinary Medical Scholars Program: Doctor of Philosophy (PhD) in Comparative Biomedical Sciences and Doctor of Veterinary Medicine (DVM) through the Veterinary Medical Scholars Program.

Degrees Offered: DVM and PhD

Medical Program: Doctor of Philosophy (PhD) in Comparative Biomedical Sciences and Doctor of Medicine (MD) through the new College of Medicine at Urbana-Champaign once approved.

Degrees Offered: MD and PhD

Doctoral Degree Program

The Doctoral Program in Comparative Biomedical Sciences (CBMS) offers the degree of Doctor of Philosophy. Areas of research focus include, but are not limited to: Cancer & Stem Cell Biology, Diagnostics & Therapeutics; Environmental & Ecological Toxicology; Infectious Disease; and Reproductive Health & Disease. The degree requires completion of core courses as well as additional "elective" coursework as deemed necessary by the student's advisory committee in consultation with the student, to complete and defend the dissertation. The opportunity to rotate through the laboratories of CBMS faculty during the first year allows doctoral students to experience the types of biomedical research taking place throughout the program and helps to ensure that each student finds a research program best suited to his or her needs and interests. Successful completion of all requirements of the PhD degree and defense of dissertation research is expected within five years.

Research Training Environment

The University of Illinois is one of the nation's premier public research universities, known for its multidisciplinary collaborative research environment. This is an ideal environment for building basic, translational and clinical research excellence in the biomedical sciences. The CVM boasts a faculty with diverse and complementary expertise and interests. Most faculty members are actively engaged in comparative biomedical education and research. There are NIH-funded research programs, notably in the areas of reproductive biology and toxicology, oncology, stem cell therapy, and viral, bacterial, parasitic and fungal infectious disease. Residency programs encompass most veterinary clinical specialties as well as pathology, pharmacology, and toxicology. As part of the flagship campus of the University of Illinois, the veterinary faculty enjoys many opportunities to collaborate with researchers in such biomedical fields as chemistry, nanotechnology, and bioengineering on newly emerging solutions to the world's health problems. Faculty members also provide extensive service to professional organizations and specialty colleges, editorial boards and scientific journals, federal research review boards, college and university governance, and public education venues. The College maintains a full-service 230,000 sq. ft. hospital for farm, companion, and exotic animals that supports, engages, and advances the teaching and research activities of the college. In 2009 the College also established the Chicago Center for Veterinary Medicine, recently renamed Medical District Veterinary Clinic, which serves as the College's headquarters for teaching, research, and public engagement initiatives in the Chicago area.

Admission

Applicants for the Doctoral Program in Comparative Biomedical Sciences must have a BS or MS degree in a STEM discipline; or a DVM, MD, or equivalent degree; or co-enrollment in the University of Illinois Professional Veterinary or Medicine Programs; and should have a minimum grade point average (GPA) of 3.0 (A = 4.0). Grade point averages of applicants will be calculated on the last 60 hours of undergraduate studies for those without a DVM, MD, or equivalent degree, or on the entire professional curriculum for those with a DVM, MD, or equivalent degree. Applicants with a GPA below 3.0 may be admitted, but will have probationary status and be required to maintain a minimum GPA of 3.0 to remain in the doctoral program. Applicants with a graduate degree, or with some graduate coursework, will be evaluated on the basis of their graduate work as well as their undergraduate or professional records. The CBMS Doctoral Program Committee must approve qualifications of students for admission.

Applicants must either have taken the Graduate Record Examination (GRE) within five years of their application, or petition the CBMS Doctoral Program Committee to waive this requirement.

The College of Veterinary Medicine is dedicated to increasing diversity in the biomedical sciences. Promoting diversity in our PhD program is therefore an important consideration in evaluating applicants. Candidates will be provided the opportunity to write an essay as to how they would add diversity to the program.

International applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) academic exam. A score of at least 611 on the paper-based TOEFL, 254 on the computer-based TOEFL, 103 on the internet-based TOEFL, or greater than 6.5 on the IELTS is required for full admission. Scores must be less than two years old on the first day of class of the entry term. Students are exempt from the TOEFL or IELTS requirement if they have completed at least two academic years of full-time study at an institution where the language of instruction is English during the five-year period prior to the proposed date of enrollment. Applicants gaining admission on the basis of their academic credentials, but scoring below the minimum requirements on the TOEFL or IELTS, will be admitted on limited status and required to take the English Placement Test (EPT) upon admission. Students will remain on limited status until the EPT is passed.

Degree Requirements

Required Courses (13-15 hours)	Course Hours
Ethics in Research (new course)	1
Grantsmanship & Scientific Writing (new course)	2
Laboratory Rotation* (new course)	0 or 2
VCM 572 Clinical Epidemiology or equivalent graduate level biostatistics	4
Journal clubs and Seminar Series (6 hours minimum)	6
Electives from the following list (chosen with advice of student's advisory committee; 20 hours maximum)**	
Signature Electives	
Cancer & Stem Cell Biology, Diagnostics and Therapeutics (new course)	4
CB 516 Reproductive & Developmental Toxicology	3
CB 520 Models in Biomedical Research	2
PATH 515 Mechanisms of Microbial Infection	3 or 4
PATH 516 Epidemiology of Infectious Disease	3
PATH 550 Concepts in Pathology	4
VCM 524 The Effective Biomedical Teacher	3
Programmatic Electives (chosen with advice of student's advisory committee)	
CB 449 Basic Toxicology	3
CB 454 Systems Toxicology	3
CB 467 Fundamentals of Pharmaceutical Discovery and Development	2
CB 512 Advanced Endocrinology	2
CB 514 Neurotoxicology	3
CB 540 Wildlife Ecosystem Health	1 or 2
CB 550 Detection and Analysis of Gene Transcripts	4
CB 551 Ecotoxicology of the Northern Hemisphere	2
CB 552 Ethics in Toxicology	1
CB 564 Comparative Clinical Pharmacology	3
CB 594 Graduate Teaching Colloquium	1
CB 596 Interdisciplinary Toxicology Seminars	1
PATH 514 Molecular Mechanisms Bacterial Pathogenesis	2
PATH 517 Principle/Method Epidemiology	4
PATH 519 Mechanisms Viral Pathogenesis	3
PATH 527 Parasitology/Epidemiology Seminars	1
PATH 528 Multivariate Biostatistics	4
PATH 544 Immunobiological Methods	3
PATH 591 Design/Analysis Biomedical Experimental	2
VCM 502 Issues in Clinical Research	2
VCM 508 Translational Molecular Pathogenesis of Veterinary Diseases	3
VCM 510 Science of Animal Well-Being	1.5
VCM 551 Introductory Surgery for Research	4
VCM 572 Clinical Epidemiology	4
General Electives (chosen with advice of student's advisory committee)	
Letter-grade graduate level courses drawn from appropriate biomedical fields (20 hours maximum credit)	≤ 20
Additional credits inside or outside biomedical fields (7 hours maximum)	≤ 7
Special problems (12 hours maximum credit)	≤ 12
Thesis research (20 hours maximum per semester)	40 to 80
TOTAL HOURS REQUIRED	96

*Laboratory Rotation required of incoming students without an identified research advisor, optional but encouraged of all other students. **Elective courses are subcategorized as Signature Electives, Programmatic Electives, and General Electives. The Signature Elective list highlights CVM electives that help to define the CBMS program and that students would be encouraged to consider. The Programmatic Electives course list consists of courses that are relevant to the

Biomedical Sciences and taught by CVM faculty with specific expertise and knowledge of the course material. The General Electives should be selected to supply students with an educational experience personalized to meet their specific career goals and research interests. No minimum course hour requirement in any category.

Additional Requirements

Minimum GPA:	3.0
GRE required	Yes
Masters Degree Required for Admission:	No (32 hrs. credit for MS)
Stage I exam required:	Yes
Stage II exam required:	Yes
Dissertation defense required:	Yes
Dissertation deposit required:	Yes

Joint Degree Programs

Students accepted into the Veterinary Medical Scholars Program complete a DVM and PhD. Medical students complete an MD and PhD.

Graduate Teaching Experience

Experience in teaching is considered a vital part of the graduate program, is required as part of the academic work of all PhD candidates in this program, and will be tailored to meet the needs, experience and professional goals of each student. Service as a teaching assistant for one semester in a CVM course is the minimum requirement of all candidates.

Faculty Research Interests

The CBMS faculty conducts research in many areas of biomedicine. Experimental models range from stem cells to rodent models to domestic animals, wildlife, and human patients.

In Cancer & Stem Cell Biology, and Diagnostics & Therapeutics, researchers integrate basic science discoveries with clinical medicine to promote the development of technologies towards improving the detection and treatment of cancer. Broad faculty research expertise relevant to the field of cancer includes drug pharmacology and toxicology, nanotechnologies, stem cell biology, novel drug discovery, and comparative tumor models. In addition to cancer, research is also being carried out in other comparative areas of diagnostics and therapeutic medicine.

In the area of Environmental & Ecological Toxicology researchers study the impact of environmental toxicants on the fetal development and juvenile and adulthood health in humans and animals. Cutting edge molecular biology, *in vitro* cell and tissue cultures, novel animal models and advanced pharmacological and epidemiological approaches are routinely used for those studies in the research laboratory, clinics and field studies.

Infectious Diseases investigators are focused on improved understanding of the molecular mechanisms of host-pathogen interactions, microbial pathogenesis, epidemiology and regulation of the immune response. Areas of specialization include bacteriology, mycology, virology, parasitology, immunology, and molecular genetics.

In Reproductive Health & Disease study areas include regulatory mechanisms of hormone secretion, ovulation, implantation and embryonic development. The impact of disrupted circadian rhythms, environmental toxicants and diets on such reproductive processes are among emerging subjects of

study. Research is performed at molecular to whole-body levels using cell culture and animal models, as well as human subjects in the basic laboratory setting and local clinics.

CBMS Training Opportunities and Programs

The CBMS faculty provides graduate instruction in molecular genetics, pharmacology, stem cell research, epidemiology and toxicology. They participate in interdisciplinary training programs including the NIEHS-funded Environmental Toxicology Training Program, the Infection Biology Training Program, the Interdisciplinary Environmental Toxicology Training Program, the Neuroscience Program, the Division of Nutritional Sciences, the Reproductive Biology Program, the Beckman Institute, and the Institute for Genomic Biology.

After completing graduate work, the student will be able to conduct research both independently and as a team member. Training in research planning and development, and writing research proposals will give our students the ability to function with teams of scientists from various biomedical fields. Teaching experience and literature study through journal clubs will form the basis for the student's development of teaching programs within his or her discipline.

For graduate veterinarians, the College of Veterinary Medicine academic departments offer a broad range of residency training programs designed to provide specialty training and certification as sanctioned by the AVMA American Board of Veterinary Specialties. The doctoral degree can be combined with residency training, or begun immediately after completing the residency. The primary goal of these combined residency and PhD programs is to prepare veterinarians for careers encompassing research and teaching in a specialty area. The additional time to complete the combined programs is usually three years (i.e., for a total of 8 years in the program), reflecting the time required to satisfy the objectives of both training programs.


Residency positions are offered in Veterinary Clinical Pharmacology which prepares graduate veterinarians for the certifying examination of the American College of Veterinary Clinical Pharmacology. A residency in Veterinary Clinical Toxicology is also offered which, together with the Animal Poison Control Center in Urbana, prepares veterinarians for board certification by the American Board of Veterinary Toxicology and the American Board of Toxicology. Residency training in Veterinary Anatomic Pathology and Veterinary Clinical Pathology are also offered, and have been highly successful in preparing graduate veterinarians for the certifying examination of the American College of Veterinary Pathologists and prominent positions in academia, governmental agencies, and industry. Clinical residency positions are offered in several areas including: Anesthesiology, Dentistry, Dermatology, Emergency and Critical Care, Equine Medicine, Equine Surgery, Farm Animal Reproduction and Medicine, Imaging, Oncology, Ophthalmology, Small Animal Internal Medicine, Small Animal Surgery and Zoological Medicine. The College of Veterinary Medicine houses a full-service teaching hospital, with facilities and equipment for studying the diseases of animals and advancement of the related concept of "One Health", which addresses the commonalities of disease mechanisms, prevention and therapy between humans and other animals. Interested students should direct inquiries about residency programs to the Office of the Dean. Details about the available veterinary residency programs will be forwarded by the appropriate departments.

Financial Aid

The majority of our doctoral students receive fellowships, or research or teaching assistantships, which pays tuition, fees, and a salary stipend.

CLEARANCES:

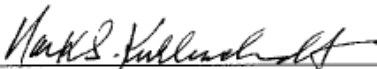
Signatures:

 12/28/15

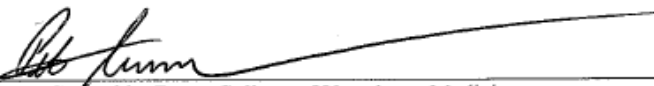
Karen Campbell, Head, Dept of Veterinary Clinical Medicine Date:

 12/30/15

Duncan Ferguson, Head, Dept of Comparative Biosciences Date:

 12/28/15

Mark Kuhleschmidt, Interim Head, Dept of Pathobiology Date:

 12/28/15

Peter Constable, Dean, College of Veterinary Medicine Date:

Graduate College Representative: Date:

Please see Appendix E for additional clearances by current department interim heads.

Appendix A: Budgetary and Staff Implications

New Degree Programs – Required Budgetary Implication Questions

- 1) How does the unit intend to financially support this program?

The CVM will use college-level resources and department-level resources supplied principally from research Indirect Cost Recovery (ICR) accounts. Additional temporary transitional support from the Office of the Provost to increase the number of supported doctoral positions that can be offered initially will be requested. Preliminary discussions had been held with the former provost, but none as yet with the current Provost, and no final agreements have been made. However, the restructuring of the program can occur without additional support from the Provost's Office. The CVM will request support for first-year fellowships for up to three new doctoral students per year with the expectation that support will gradually transition as college ICR increases. The CVM will supply second-year support. Each PhD student's research advisor will be responsible for identifying support in subsequent years. Supplementary to these three positions, as is currently being done, each department and the CVM will collectively fund an additional three first-year doctoral students. Six doctoral students per year is considered the minimum number necessary to sustain a vibrant program. Additional graduate student support will also be pursued through applications for public and private training grants.

The CVM will also provide funding to support the work of the Doctoral Program Committee and the Program Administrative Assistant.

- 2) Will the unit need to seek campus or other external resources?

Yes. The College will seek support from campus for critical faculty hires as part of the 7-year faculty hiring plan. Additionally, as described above, the CVM will seek assistance initially from campus to supply first-year support for up to three doctoral students, and will pursue public and private training grants.

- 3) If no new resources are required, how will the unit create capacity or surplus to appropriately resource this program? (What functions or programs will the unit no longer support?)

N/A

- 4) Please provide a market analysis: What market indicators are driving this proposal? What type of employment outlook should these graduates expect? What resources will be required to assist students with job placement?

Market Indicators and Employment Outlook for Program Graduates -- There is a well-documented national need for training programs in biomedical research described in a variety of federal, public and organization workforce study reports, including the following:

- American Veterinary Medical Association Workforce Study. 2013. www.avma.org.
- National Research Council. 2013. *Workforce Needs in Veterinary Medicine*. Washington, DC: The National Academies Press.

- National Research Council. 2011. *Research Training in the Biomedical, Behavioral, and Clinical Research Sciences*. Washington, DC: The National Academies Press.
- *Animal Research in a Global Environment: Meeting the Challenges*. Proceedings of the November 2008 National Research Council of the National Academies.
- National Research Council. 2005. *Critical Needs for Research in Veterinary Science*. Washington, DC: The National Academies Press.
- National Research Council. 2004. *National Need and Priorities for Veterinarians in Biomedical Research*. Washington, DC: The National Academies Press.
- College of Veterinary Medicine Center for One Health Illinois. <http://vetmed.illinois.edu/college-organization/center-for-one-health-illinois/>.
- One Health Commission report. www.Onehealthcommission.org.

The jobs market for individuals with dual DVM/PhD or dual MD/PhD degrees is particularly favorable, and students in such programs will be important for this revised program. One of the most recent evaluations of the projected needs and employment outlook of veterinarians with doctoral degrees is the 2013 NRC report, *Workforce Needs in Veterinary Medicine*. The report provides a sector-by-sector analysis of the workforce trends in veterinary medicine. Individuals with dual DVM/PhD degrees have a competitive edge in obtaining initial employment in several areas within these sectors, and would garnish increased starting salaries and have enhanced potential for promotions and career advancement. While the needs between industrial, government and academic sectors vary, the overall outlook is quite good for DVM/PhD graduates to move directly after graduation into positions of high responsibility and influence. The following excerpts have been taken from the 2013 NRC report:

Colleges and schools of veterinary medicine face a precarious situation. They are in desperate need of trained graduates for faculty positions in structural biology, physiology, pharmacology, pathology, clinical pathology, infectious diseases of animals and zoonotic diseases, virology, microbiology, food safety, epidemiology, and nutrition. Also needed are clinical faculty members with expertise in both companion-animal and food-animal specialties, who would typically be expected to have specialty-board certification or a PhD in addition to the DVM. In the near future, the profession will experience major setbacks if veterinary schools lack a sufficient number of experts to serve as faculty.

Salaries for veterinarian positions in the federal government have increased. However, some positions require a PhD or additional expertise. There are not many individuals available to fill those jobs, considering the demand for similarly qualified veterinarians in the biomedical industry, where salaries are significantly higher.

The highest paying jobs for veterinarians are those in pharmaceutical, biotechnology, diagnostics, contract research, animal health, animal feeds, and agrochemical companies, which in 2009 paid an average annual salary of \$167,415. Positions for veterinarians include those in basic (discovery) research, product development, pre-clinical research and product safety research, regulatory affairs, marketing and sales, and customer support.

The high salaries offered in industry are suggestive of a strong demand for veterinary expertise for which there is a true shortage. Simply expanding the number of new

DVMs by itself, however, will have little effect in filling industry positions, which require advanced training in pathology, toxicology, laboratory animal medicine or other sciences.

The 2011 NRC publication, *Research Training in the Biomedical, Behavioral, and Clinical Research Sciences*, evaluated the market for physician researchers with combined MD and PhD degrees. Their conclusion was that the job prospects are excellent, but there is an inadequate number of training positions to accommodate the potential need. This would therefore seem to be an excellent area for growth of a combined-degree training program:

Graduates of M.D./Ph.D. programs are now a critical and very successful component of the clinical, translational, and basic research workforces in medical schools and major teaching hospitals. They are in demand as medical school faculty members and are well represented among clinical division heads and department chairs.

To increase the attractiveness of the CBMS program and marketing success to potential students, emphasis will be placed on program efforts to alleviate added student debt, improve academic success, and accelerate transition to careers in the biomedical sciences, including the following:

- Financial support -- The restructured program will strive to increase the number of doctoral positions paying competitive salaries through fellowships, and research and teaching assistantships. Obtaining private and public gifts and grants to expand the size of the doctoral student program will be another goal. Like the time to degree, support of this nature will be used as a recruiting tool to assure that the program attracts the best possible student candidates of the greatest ethnic and racial diversity.
- Laboratory rotations -- Laboratory rotations in the first year will help students identify a laboratory and research project early in their programs. PhD/residency students, and combined professional degree/PhD students will be encouraged to take course credit that can be applied toward the PhD while pursuing their complementary training.
- Assistance with Job Placement -- This restructured program will be committed to assisting in the career placement of all program graduates. One hundred percent post-graduate placement one year after awarding the degree will be a programmatic goal, and will be the shared responsibility of the Graduate Program Committee and Program Administrative Assistant.

5) If this is a proposed graduate program, please discuss the program's intended use of waivers. If the program is dependent on waivers, how will the unit compensate for lost tuition revenue?

As is standard at the University of Illinois, tuition waivers will be offered to students with research and teaching assistantships.

Appendix B: Proposed Curriculum

Graduates of this program will be trained in the principles of translational biomedicine. The knowledge that encompasses Comparative Biomedical Science is derived from a broad range of biological, biomedical and bioengineering disciplines. Acknowledging that the primary goal of the CBMS PhD degree program is to prepare students for an academic or research career, with the ability to conduct research both independently and with teams of scientists from various areas of the biomedical or related fields, the required didactic coursework for the PhD program should provide a broad education independent of the specific research focus of our students.

All students enrolled in the program will be expected to select a graduate advisor and research advisory committee by the end of their first year. Preliminary research and additional course work will be completed during the second year, following the recommendations of the student's advisory committee. Students will take their Stage I examinations at the end of their second year. Students who have had an MS degree awarded by an accredited institution receive 32 hours of credit towards their PhD degree. In these cases, the student's advisory committee should determine what coursework completed in the MS program is relevant and accountable towards the PhD coursework requirement.

A table of the coursework requirements can be found on Page 8 of this proposal. A minimum of 96 total course hours is required for graduation. Course offerings to support this program are categorized as Required Courses, Electives, and Thesis Research. The Required Courses (13-15 hours) are courses considered critical to a career in the Biomedical Sciences, or otherwise provide knowledge that we do not want a student to graduate from the program without having. Elective courses are subcategorized as Signature Electives, Programmatic Electives, and General Electives. The Signature Elective list highlights CVM electives that help to define the CBMS program and that students would be encouraged to consider. The Programmatic Electives course list consists of courses that are relevant to the Biomedical Sciences and taught by CVM faculty with specific expertise and knowledge of the course material. The General Electives should be selected to supply students with an educational experience personalized to meet their specific career goals and research interests. There will be no minimum requirement for students to take in any of the elective course categories. Rather, each student in consultation with his or her PhD advisory committee, will determine which courses best complement their doctoral thesis research, academic skill set, and career goals.

Course Descriptions

CB 449 Basic Toxicology; Credit: 3 hours.

Introduction to basic toxicology principles/applications and the pharmacokinetics, absorption, distribution, metabolism and excretion of drugs, dietary supplements and other compounds foreign to the body.

CB 454 Systems Toxicology; Credit: 3 hours.

Provides an overview of the effects of chemicals and their mechanisms of action in a variety of organ systems. Topics include toxicology of the nervous, developmental, reproductive, thyroid, renal, hepatic, immune, pulmonary, and gastrointestinal systems. Course Information: Prerequisite: Completion of a course in basic toxicology or consent of instructor.

CB 467 Fundamentals of Pharmaceutical Discovery and Development; Credit: 2 hours.

A systematic overview of the pharmaceutical discovery and development process, utilizing industry speakers. Examines fundamental aspects, practices and strategies utilized in the discovery and evaluation of pharmaceutical agents developed for human and animal use. The discovery, preclinical and clinical assessment of drugs is reviewed from both a chemical and biological perspective, in addition to the regulatory guidelines governing those activities and the required post-market surveillance. Also examines major ethical approaches and the strengths and limitation of various development strategies. Course Information: Approved for both letter and S/U grading. Prerequisite: At least one semester of physiology (MCB 103, MCB 240, or equivalent), and biochemistry (MCB 354 or MCB 450 or equivalent) or consent of instructor.

CB 512 Advanced Endocrinology; Credit: 2 hours.

Seminars, lectures, student reports, and discussions of recent advances in endocrinology. Same as ANSC 530 and MCB 512. May be repeated to a maximum of 8 hours. Prerequisite: Consent of instructor.

CB 514 Neurotoxicology; Credit: 3 hours.

Examines toxic responses of the mammalian nervous system to xenobiotics (therapeutic agents, drugs of abuse, toxins, environmental and industrial chemicals) from the molecular and cellular levels to the behavioral level. Also covers neuroteratology, sensitive periods for neurotoxicity and the potential role of environmental factors/xenobiotics in the etiology of nervous system disorders. Same as ENVS 514 and PSYC 515. Prerequisite: Credit or concurrent registration in MCB 450 or equivalent.

CB 516 Reproductive & Developmental Toxicology; Credit: 3 hours.

Introduction to reproductive and developmental toxicology that examines causes and manifestations both of structural malformations and of functional deficits in mammals. Topics covered include interactions between external factors and developmental gene expression, the behavioral consequences of chemical exposure, identification and regulation of reproductive and developmental toxicants. Examples emphasize reproductive and developmental toxicants that are present in the human environment. Same as ENVS 516. Prerequisite: Consent of instructor.

CB 520 Models in Biomedical Research; Credit: 2 hours.

Students enrolled in this course will review scientific literature pertaining to experimental models used in biomedical research, and will present selected papers to the class. Faculty members who use these models in their research will attend student presentations and participates in the associated discussions. By the end of the course, student will be familiar with the uses, advantages and limits of key molecular, cellular and animal models used in a range of biomedical research fields. May be repeated in separate terms if topics vary. 2 graduate hours or 2 professional hours. Prerequisite: No prerequisites for graduate students enrolled in a Master of Science or PhD program in a biomedical field. Professional students must obtain the coordinator's authorization.

CB 540 Wildlife Ecosystem Health; Credit: 1 or 2 hours.

Provides veterinary professional students and graduate students with an introduction to the use of medical reasoning and technology in the investigation of problems related to conservation biology and ecosystem health. The course is an interactive, video conference assisted seminar series, jointly hosted by the University of Illinois College of Veterinary Medicine, Loyola University Chicago Stritch School of Medicine, and the Chicago Zoological Society/Brookfield Zoo. Together, these institutions comprise the "Conservation Medicine Center of Chicago." Topics include the evolutionary origins of

HIV/AIDS, the ecology of vector-borne diseases, global amphibian population declines, wildlife epidemiology and pathology, and the role of zoos in disease surveillance and management.

CB 550 Detection and Analysis of Gene Transcripts; Credit: 4 hours.

Gives participants the background information and hands-on experience in the methodologies necessary to utilize cloned genes for the detection and quantitation of specific mRNA transcripts in RNA extracted from tissue or cell culture samples. Methodologies covered will include: recombinant plasmid propagation, cDNA probe isolation and isotopic labeling, RNA isolation, Poly A+ mRNA selection, gel separation and transfer of RNA to a membrane (Northern blot), hybridization of specific gene probes to membrane bound RNA (Northern hybridization), detection and quantitation of hybridization signal. These basic methodologies are widely applicable to different experimental systems. They allow an investigator to monitor the effects of physiological manipulations, to animals or cultured cells, at the molecular level. Prerequisite: Consent of instructor.

CB 551 Ecotoxicology of the Northern Hemisphere; Credit: 2 hours.

Sources, environmental fate, and adverse effects of manmade and naturally-occurring chemicals on terrestrial and aquatic wildlife and ecological systems. Addresses wildlife health, including direct toxic effects and indirect effects via toxicity to other species. Focuses mainly on northern hemisphere with multiple examples from North America and Europe. Includes methods to reduce and prevent ecological and wildlife health problems. Includes one or more field trips comparing samples and animals from contaminated, pristine, and remediated sites. Examines laboratory ecotoxicology methods. Course Information: Prerequisite: At least one semester of biology (IB 150 or equivalent), and biochemistry (MCB 354 or equivalent).

CB 552 Ethics in Toxicology; Credit: 1 hour

Ethical issues in the practice of toxicological research collaboration, authorship and plagiarism, professional responsibility to subjects (both human and animal), whistle-blowing, codes of ethics, legal obligations. Case Studies.

CB 564 Comparative Clinical Pharmacology; Credit 3 hours.

Lecture-discussion of the clinical use in animals of human and veterinary drugs, including current literature review on pharmacodynamic species differences, novel indications, and contrast of therapeutic alternatives. Course Information: Prerequisite: Graduate Veterinarian or consent of instructor.

CB 594 Graduate Teaching Colloquium; Credit: 1 hour.

The course objective is to provide students within the College of Veterinary Medicine a forum to learn and discuss topics related to teaching as well as practice and receive feedback on their teaching skills. Satisfactory completion of this course allows students to complete requisites set by the University of Illinois Center for Teaching Excellence to obtain a Certificate in Foundations of Teaching.

CB 596 Interdisciplinary Toxicology Seminar; Credit: 1 hour.

Interdisciplinary seminar on topics within the area of toxicology; topics vary each term. Seminars are presented by faculty, visiting lecturers, and students based upon their study, research, and/or professional activities in the selected topic area. May be repeated to a maximum of 8 hours if topics vary. Prerequisite: Consent of instructor.

PATH 514 Molecular Mechanisms Bacterial Pathogenesis; Credit: 2 hours.

Introduction of current research literature on host-microbe interactions. The molecular basis for disease arising from these interactions will be stressed. Prerequisite: One or more 400- or 500-level courses in microbiology, immunology, or biochemistry, and consent of instructor.

PATH 515 Mechanisms Microbial Infection; Credit: 3 or 4 hours.

Newer concepts of host-microorganism relations; emphasis on the dynamics and pathogenic mechanisms of microorganisms, immune responses and defense factors of the host, and pathogenesis of specific infections. Lectures, discussions, laboratory, and special problems. Prerequisite: MCB 426 or VM 605, or equivalent; consent of instructor.

PATH 516 Epidemiology Infectious Disease; Credit: 3 hours.

Ecology of infection and disease; spread of disease and modes of transmission; methods of control; socioeconomic consideration; selected diseases: malaria, Lyme disease, anaplasmosis, schistosomiasis, salmonellosis, pseudorabies, AIDS. Student presentations. Prerequisite: Epidemiology class (VM 608 or equivalent), or consent of instructor.

PATH 517 Principle/Method Epidemiology; Credit: 4 hours.

Course covers principles of theoretical and applied epidemiology, with examples from veterinary and human medicine. The aim of the course is to integrate epidemiologic concepts and quantitative methodology in order to evaluate disease risk and treatment options at the individual and population levels. Topics include causal inference, epidemiologic study design, evaluation of bias, outbreak investigation, and special areas within epidemiology. Same as CHLH 517. Prerequisite: Graduate student standing or consent of instructor.

PATH 519 Mechanisms Viral Pathogenesis; Credit: 3 hours.

Lecture-discussion on topics of molecular mechanisms of viral pathogenesis. Mechanisms of infection, virulence, viral spread, interaction with the immune system, persistence and other host-parasite interactions are covered using modern literature and in depth exploration of several animal virus systems. Same as MCB 561. Prerequisite: PATH 433 or VM 607 or consent of instructor.

PATH 527 Epidemiology Seminar; Credit: 1 hour.

Discussion of selected historic and current literature related to epidemiology. May be repeated to a maximum of 2 hours.

PATH 528 Multivariate Biostatistics; Credit: 4 hours.

The application of multivariate data analysis to biology, agriculture, and medicine. Includes principal components and factor analysis, multivariate analysis of variance, discriminate analysis, cluster analysis, and multidimensional scaling. Specific applications include clinical diagnosis, nutritional and physiological profile analysis, ecological niche analysis, and patterns of genetic relatedness using molecular genotyping. Computer exercises using standard statistical software are used throughout. Students will also have individual projects and report their analysis in class presentations. Same as IB 508. Prerequisite: A course in multiple linear regression (PATH 591 or equivalent).

PATH 544 Immunobiological Methods; Credit: 3 hours.

A number of immunobiological methods and current immunological techniques are introduced in the context of various research designs with reference to their significance, their evolution and historical value. Detailed description of protocols includes optimization of parameters and modifications of

conditions to satisfy different research situations and trouble shooting. Students are required to perform the techniques, collect data, analyze results and keep records. Laboratory reports including documented critical assessment of the attained conclusions are required for each technique. Same as ANSC 554. Approved for both letter and S/U grading. Prerequisite: VM 605 or MCB 408 or ANSC 450 and consent of instructor.

PATH 550 Concepts in Pathology; Credit: 4 hours.

Lectures and related discussions of selected topics in experimental and theoretical aspects of general pathology. Emphasis on interdisciplinary approach to the mechanisms of disease. Prerequisite: DVM degree or MS in Biology; consent of instructor.

PATH 591 Design/Analysis Biomedical Experimental; Credit: 4 hours.

Principles of sampling, treatment assignment, and statistical analysis applied to biomedical experiments; major emphasis include sample size determination, dose-response functions, single and multifactor designs, randomized blocks and repeated measures, and analysis of covariance. Prerequisite: CPSC 440 or PATH 524, or consent of instructor.

VCM 502 Issues in Clinical Research; Credit: 2 hours.

This course is intended for students interested in applying analytical epidemiological methods in assessing the health and disease status of populations (animal and human) and assessing the factors affecting that status. It includes lecture/discussion sessions and exercises on the study design, statistical analysis, and interpretation of clinical trials and cross-sectional, case-control, and longitudinal studies. Database management, risk assessment, and techniques for enhancing the validity of field-based studies of naturally occurring disease will also be covered. Prerequisite: Consent of instructor.

VCM 508 Translational Molecular Pathogenesis of Veterinary Diseases; Credit: 3 hours.

Mechanisms of Clinical Disease will provide foundational understanding for molecular pathologic processes and their respective clinical manifestations of disease to reinforce comprehensive bench-to bedside learning. Molecular topics of emphasis covered will include 1) Cellular responses to stress; 2) Inflammation; 3) Tissue Repair; 4) Circulation and hemodynamics; 5) Immunity; 6) Cancer; and 7) Infectious diseases. Translational associations will be emphasized which link pathologic mechanisms with specific clinical disease manifestations which affect companion animal species.

VCM 510 Science of Animal Well-being; Credit: 1.5 hours.

Reviews scientific literature on the well-being of agricultural animals. Topics include indicators of well-being, causes and indicators of stress, impact of housing, management, and veterinary practices on well-being, and enrichment methods. Topics relevant to all major agricultural animal species (swine, dairy cattle, beef cattle, horses, poultry, and sheep) will be covered each semester, in accordance with the interests of enrolled students. Students will critically review and summarize literature and lead and participate in class discussions. Grades will be based on attendance, quality of performance, and a final examination. Same as ANSC 510. Prerequisite: Graduate student in the College of Veterinary Medicine or College of ACES, or consent of instructor.

VCM 524 The Effective Biomedical Teacher; Credit: 3 hours.

The course is designed to provide current or future university-level biomedical educators with the knowledge, motivation and proficiencies needed to apply the most recent developments in higher education to their teaching. The overall aim of the course is to cultivate an informed, passionate and

adventurous approach to teaching and learning in participants. This will be achieved by fostering new thinking about teaching and learning, and by encouraging collaborative and cooperative learning between the class members.

VCM 551 Introductory Surgery for Research; Credit: 1 hour.

Surgical principles including sterile technique, hemostasis, tissue handling, instrumentation, and wound closure and healing are taught with emphasis on application in domestic and laboratory animals. Laboratory covers demonstration and practice of surgical principles. Prerequisite: Graduate standing or consent of instructor.

VCM 572 Clinical Epidemiology; Credit: 4 hours.

Reviews the common epidemiologic and statistical methods used to design studies, analyze data, and interpret diagnostic tests and research findings.

New Courses to be Developed

Cancer & Stem Cell Biology, Diagnostics and Therapeutics; Credit: 4 hours.

Lecture/discussion on the emergent research relevant to cancer and stem cell biology which will equip graduate students with knowledge and skills needed to understand the molecular underpinnings of cancer and stem cell processes and how these principles translate to improved diagnostics and therapeutics. Topics that will be emphasized include carcinogenesis, inflammation, cellular responses to injury, cancer immunology, and novel diagnostic and therapeutic strategies for the detection and treatment of cancer.

Ethics in Research; Credit: 1 hour.

Lecture/discussion course focusing on research ethics and a variety of related issues that can influence success in graduate school in the biological sciences, including scientific integrity and compliance with regulations for laboratory research. Approved for both letter and S/U grading. Prerequisite: Consent of instructor. Same as MCB 580

Grantsmanship & Scientific Writing; Credit: 2 hours.

This course (taken in year 2 or 3 of doctoral training) will teach skills critical to identifying and pursuing research funding, and scientific writing. Students are required to write a full grant in the NIH style.

Journal clubs and Seminar Series (New or restructured courses); Credit: 1 or 2 hours.

Interdisciplinary seminars and journal clubs on topics in areas of relevance to the research of the doctoral student will be offered year-round and taken for course credit. Faculty, visiting lecturers, and students may present seminars based upon their area of study, research, and/or professional activities. Topics and course structures may vary each term. Minimum of 6 credit hours required.

Laboratory Rotations; Credit: 2 hours.

Laboratory Rotation through participating laboratories -- Laboratory rotations provide in-depth exposure to areas of research topics covered in the Program and the means by which students select their Dissertation Advisor. A strong student/advisor relationship is a key element in graduate student satisfaction, and successful completion of the PhD program. During their first year, students will rotate through a minimum of two laboratories of CBMS faculty members. The laboratories will be selected by the student based on their research interests, and with the consent of the faculty member.

The faculty member, or their designee, who will serve as the student mentor for the rotation, will guide the laboratory experience. Rotations may lead to presentations at scientific meetings and, occasionally, to a publication. However, the emphasis during a laboratory rotation is on the learning experience rather than productivity. Rotation mentors typically are CBMS faculty members. However, upon the DPC Chair's approval, the students can rotate in a laboratory of a non-Program faculty member of the University of Illinois. Credit hours: 1 credit hour per lab.

Appendix C: Doctoral Program Faculty/Staff Roles and Responsibilities

Doctoral Program Committee

A Doctoral Program Committee (DPC) will direct the CBMS program. The DPC will be primarily responsible for overseeing student admissions and advisory committees. Membership on the DPC will be restricted to faculty members of the Graduate College who have attained Doctoral Program Research Advisor (DPRA) status. A DPC Chair will be elected by the DPC membership and will report directly to the college dean. Conflicts between departments in how resources are allocated, and how doctoral student recruiting occurs will be resolved by the dean in consult with the DPC.

CBMS faculty with academic appointments in other university departments will be eligible for committee membership. All committee members will serve three-year staggered terms (inaugural committee appointments will be for up to 3 years). Reelection to a second consecutive three-year term is permissible. One of the seven members will serve as Chair for a minimum of two years, and up to 3 years, and will be elected by majority vote of the DPC. The Chair must have a majority academic appointment in a CVM department. The Chair will call meetings and set the agenda. The CVM Associate Dean of Research and Advanced Studies (ADRAS) and the heads of the CVM departments will serve as *ex officio* nonvoting members of the DPC, and the CVM will establish a budget for the committee to carry out its duties. One PhD student, and an alternate, will also serve as a nonvoting member of the committee, and will be elected annually by majority vote of the program doctoral students. The DPC will meet at least once in the fall and spring semesters, and at other times when requested by the DPC Chair, or the majority of the DPC, to address any issues that require more immediate attention. A quorum of five regular voting members must be present to hold an official meeting. Any chair who is unable to serve, or is not meeting his or her duties, can be replaced at any time following a majority vote by remaining DPC members. Members of the committee may request a special meeting of the DPC to discuss and vote on replacement of the Chair, which will be arranged by the DPC.

The election or reelection of DPC members will be the responsibility of CVM graduate faculty holding DPRA status, and graduate faculty members who have not yet achieved DPRA status but who are currently co-advising a PhD student, and will vote from a slate of approved nominees. Approval for nomination will require DPRA status (faculty members who have not yet achieved DPRA status but who are currently co-advising PhD students will also be eligible for nomination) and a majority vote of the DPC. Faculty may submit their name for nomination to the DPC directly or through the endorsement of their department head. Candidates whose application for nomination is denied by the DPC may file an appeal to the CVM Dean, who will appoint an ad hoc Appeals Committee of 3 or 5 DPRAs not currently serving on the DPC to vote on the appeal within 30 days. A simple majority vote of the Appeals Committee to reverse the initial decision will be binding. The DPC will be responsible for organizing the elections, tallying the votes, and ranking the candidates by the number of votes obtained. Candidates receiving the largest number of votes will fill the DPC membership openings. Ties will require a run-off vote.

The responsibilities of the DPC will include the following:

- 1) Approve appointments to PhD advisory committees. It will be the responsibility of the major advisor to propose the makeup of all committees, which must be approved by the department

head of the major advisor before submission to the DPC. The advisory committee must include, in addition to the major advisor, at least one member who has served as a research advisor for at least one doctoral student who has successfully defended a PhD in the biomedical sciences.

- 2) Approve requests for Doctoral Program Research Advisor (DPRA) appointments. The DPRA must be approved by his/her department head before submission to the DPC.
- 3) Oversee recruitment of new doctoral students and promote the program through advertisements.
- 4) Review and approve doctoral student applications for admission to the program, and graduation documents.
- 5) Author an annual report of program activities and accomplishments. The report will be given to the CVM Dean, who will forward it to the dean of the Graduate College and the Provost. The DPC Chair will present the report annually at a CVM faculty meeting.
- 6) Grow additional revenues for doctoral student support in collaboration with the CVM Associate Dean for Research and Advanced Studies.
- 7) Hold votes by DPRAs on DPC membership.
- 8) Review performance of doctoral program faculty and students, including addressing grievances of doctoral students and soliciting formal feedback from doctoral students regarding mentorship.
- 9) Promote diversity in the doctoral student body, and support for campus diversity initiatives, such as the Early Applications and Campus Visit Program (ASPIRE) and the Summer Research Opportunities Program.
- 10) Advising the dean and department heads on faculty hires essential to maintaining the quality of the doctoral program.

Membership of the Inaugural Doctoral Program Committee

Members of the CVM graduate faculty who are currently serving as major research advisors (PhD), or who have served as the major research advisor for three or more doctoral students that have successfully completed a PhD degree, will be awarded inaugural DPRA status. The inaugural DPC, comprised of 7 members, will be elected from a slate of all inaugural DPRA faculty members by a vote of all DPRA member-eligible faculty. Elected candidates will be presented to the CVM Dean for appointment for one- to three-year terms determined by number of votes received.

Administrative support

A Program Administrative Assistant (PAA) will oversee the day-to-day administrative operations of the program. A job description will be written.

Doctoral Program Research Advisors

To initiate service as a Doctoral Program Research Advisor, faculty must meet the following criteria:

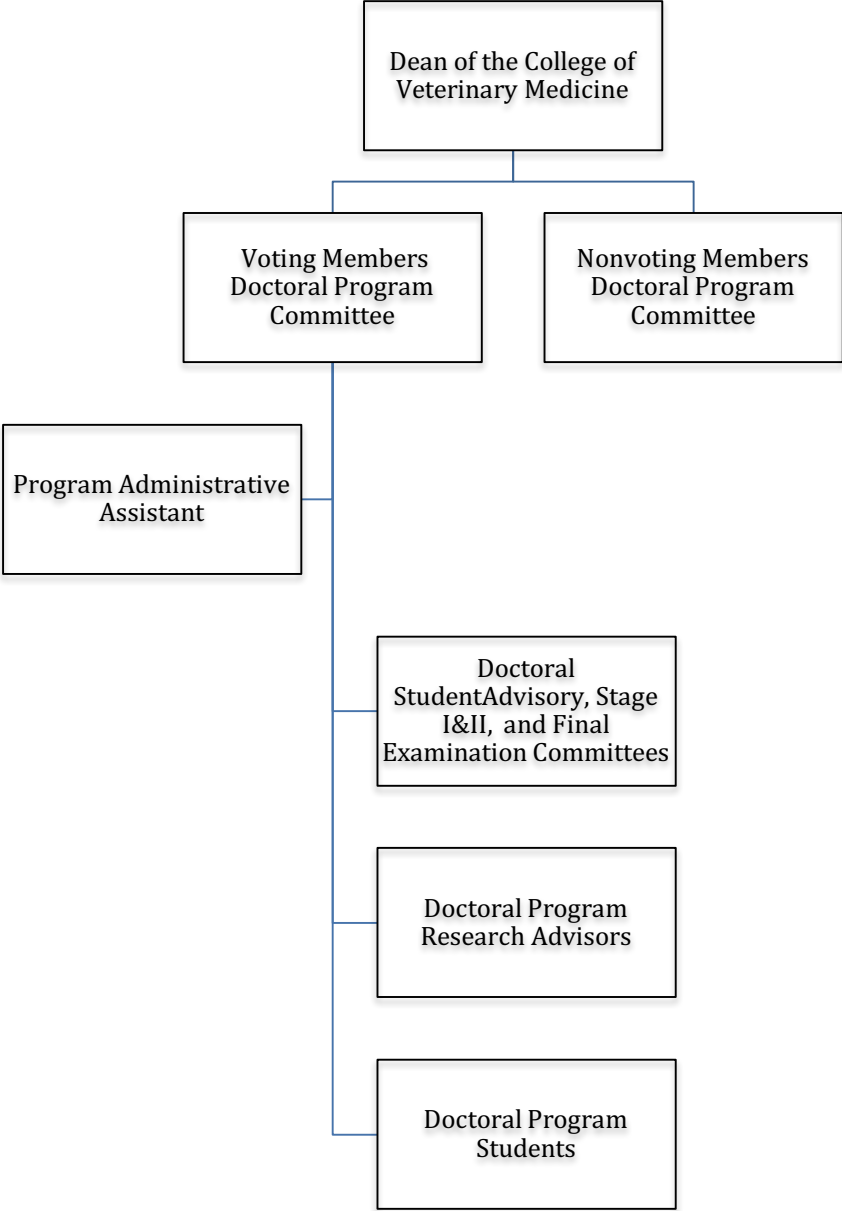
- 1) Be a member of the University of Illinois Graduate College Faculty.
- 2) Have a documented plan sufficient to financially support a doctoral student.
- 3) Hold a PhD or equivalent degree, DVM or equivalent, or MD or equivalent with demonstrated research training and documented experience as an independent investigator.
- 4) Provide evidence of current independent research productivity and scholarly activity.
- 5) Members of the Graduate Faculty not meeting criteria 3 or 4 will be able to serve as PhD research advisors and receive credit for having trained a PhD student so long as a DPRA serves as a co-advisor.

Doctoral Program advisors will be evaluated every 5 years after initiation of service for renewal of DPRA member status. Criteria for renewal will include evidence of continued engagement in doctoral student training, such as participation in the CBMS curriculum, student supervision, adequate research resources and scholarly productivity. It is anticipated that the DPC will develop criteria for reappointment so that the faculty would know if they are on track for reappointment. Faculty who are denied membership or whose membership is not renewed, or have any other disagreements with DPC decisions, may file an appeal to the CVM Dean, who may then appoint an independent committee of 3 or 5 members to render a decision within 30 days of appointment. A simple majority vote of the committee is required for reversal of a DPC decision. Members of the appeals committee must meet criteria 1 to 4 for DPRA membership, and must not be current DPC members. Past DPC membership is acceptable.

Doctoral Program Advisory, Stage I, Stage II and Final Examining Committees

All members of the University of Illinois Graduate College Faculty are eligible to serve on doctoral committees. Selections to the committees will be approved by the DPC. The minimum size of a committee is three faculty members, and one member must have their primary appointment from an academic unit outside of the CVM. Each student's major advisor must supply written documentation as to what expertise each committee member provides, and the role each will play on the committee. Each committee nominee will acknowledge by signing the document that they recognize and agree to their participation on the committee. Honorary or token committee appointments will not be approved. The major advisor may petition the DPC for permission to add individuals who are not members of the Graduate Faculty to a committee. Justification for the appointment should include a description of how the addition will meaningfully increase the scientific or technical knowledge of the committee, or the committee's ability to gauge the student's knowledge during Stage I & II exams and assure the rigor of the dissertation.

ORGANIZATIONAL CHART



**Appendix D:
College Support for the Restructured Program**

Results of Poll of the CVM Graduate Faculty

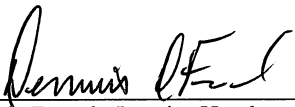
In December 2015, the College of Veterinary Medicine held an anonymous college-wide poll, by electronic ballot, of its graduate faculty. The results follow:

Question: I support the plan to restructure the CVM doctoral programs into a single program that will be administered at the college level, as outlined in the 12/7/2015 proposal prepared for submission to the Senate Educational Policy Committee.

Those responding “Yes”	31
Those responding “No”	0

**Appendix E:
Clearances by Interim Department Heads**


Clearances:


Dennis French, Interim Head
Department of Veterinary Clinical Medicine

21 MAR 2016
Date:


David Bunick, Interim Head
Department of Comparative Biosciences

3/21/16
Date:


Philip Solter, Interim Head
Department of Pathobiology

3/21/2016
Date:

UNIVERSITY OF ILLINOIS
AT URBANA - CHAMPAIGN

EP.16.70

Office of the Provost and Vice Chancellor
for Academic Affairs

Swanlund Administration Building
601 East John Street
Champaign, IL 61820



April 1, 2016

Bettina Francis, Chair
Senate Committee on Educational Policy
Office of the Senate
228 English Building, MC-461

Dear Professor Francis:

Enclosed is a copy of a proposal from the College of Veterinary Medicine to merge all existing Ph.D. programs into a single doctoral program named "Comparative Biomedical Sciences" and thus to then eliminate all existing Ph.D. degrees.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Kathryn A. Martensen'.

Kathryn A. Martensen
Assistant Provost

Enclosures

c: J. Hart
K. Campbell
D. Ferguson
M. Kuhlenschmidt
P. Solter
A. McKinney
A. Edwards

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Graduate College

204 Coble Hall
801 South Wright Street
Champaign, IL 61820-6210



Executive Committee

2015-2016 Members

Wojtek Chodzko-Zajko
Dean & Chair
Graduate College

Members

Abbas Aminmansour
Architecture

John D'Angelo
Mathematics

Nicki Engeseth
Food Science & Human
Nutrition

Susan Fowler
Special Education

Rutilio Fratti
Biochemistry

Paul Hergenrother
Chemistry

Kevin Jackson
Accountancy

Samantha Knoll
Mechanical Science &
Engineering

John Lambros
Aerospace Engineering

Isabel Molina
Media and Cinema Studies &
Latina/Latino Studies

Kirsten Phelps
Library and Information
Science

Sandra Rodriguez-Zas
Animal Sciences

Mark Rood
Civil & Environmental
Engineering

Lisa Rosenthal
Art & Design

Angeliki Tzanetou
Classics

Michelle Wang
Statistics/Psychology/
Bioengineering

March 30, 2016

Kathy Martensen
Office of the Provost
207 Swanlund MC-304

Dear Kathy,

Enclosed please find the proposal titled: "Proposal to unify all College of Veterinary Medicine PhD programs into a single doctoral program named "Comparative Biomedical Sciences", and eliminate the existing PhD degrees".

The proposal was received in the Graduate College on January 20, 2016. It was reviewed at the January 28, 2016 Graduate College Program Subcommittee meeting. The committee requested clarification of several items in the proposal. Those clarifications requested and their respective responses from the sponsors are documented in the attached proposal.

The proposal was forwarded for review at the March 17th Graduate College Executive Committee meeting. The committee approved the proposal without revision. The proposed program has been found to meet campus requirements and guidelines for graduate education.

I send the proposal to you now for further review.

Sincerely,

A handwritten signature in black ink, appearing to read 'John C. Hart', with a long horizontal line extending to the right.

John C. Hart
Executive Associate Dean
Graduate College

c: K. Campbell
D. Ferguson
M. Kuhlenschmidt
P. Solter
A. McKinney

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

EP.17.09

Office of the Provost and Vice Chancellor
for Academic Affairs

Swanlund Administration Building
601 East John Street
Champaign, IL 61820



August 18, 2016

Bettina Francis, Chair
Senate Committee on Educational Policy
Office of the Senate
228 English Building, MC-461

Dear Professor Francis:

Enclosed is a copy of a proposal from the College of Veterinary Medicine to combine the existing Ph.D. programs into a single doctoral program named "Comparative Biomedical Sciences," and eliminate the existing Ph.D. programs.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Kathryn A. Martensen'.

Kathryn A. Martensen
Assistant Provost

Enclosures

c: D. French
D. Bunick
P. Solter
A. McKinney
J. Hart
A. Edwards