VETERINARY MEDICAL SCIENCE

http://www.vetmed.illinois.edu/

College of Veterinary Medicine

Dean of the College of Veterinary Medicine (http://www.vetmed.illinois.edu): Peter D. Constable

Prospective students for the Veterinary Medical Scholars Program (D.V.M./Ph.D.) may contact:
Dr. Lois Hoyer
Associate Dean for Research and Advanced Studies
2001 South Lincoln Ave.
Urbana, IL 61802
Contact: Nikki Hausmann, nhausman@illinois.edu
(217)-333-4291
www.vetmed.illinois.edu/asa/vmsp.html (http://www.vetmed.illinois.edu/asa/vmsp.html)

Prospective students for the D.V.M./MPH program may contact:
Dr. John Herrmann, jah1110@illinois.edu
vetmed.illinois.edu/asa/mp (http://vetmed.illinois.edu/asa/mp)

Major: Comparative Biomedical Sciences
Degrees Offered: Ph.D.

Joint Degree Programs
Degrees Offered: D.V.M./MPH; D.V.M./Ph.D.

Departments

- Comparative Biosciences (http://catalog.illinois.edu/graduate/graduate-majors/veterinary-med-sci/comparative-biosciences)
- Pathobiology (http://catalog.illinois.edu/graduate/graduate-majors/veterinary-med-sci/pathobiology)
- Veterinary Clinical Medicine (http://catalog.illinois.edu/graduate/graduate-majors/veterinary-clinical-medicine)

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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, 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 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. Page 7 of 27 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.

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 fullservice 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.
### Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ethics in Research</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Grantsmanship &amp; Scientific Writing</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Laboratory Rotation</td>
<td>0 or 2</td>
</tr>
<tr>
<td>VCM 572</td>
<td>Clinical Epidemiology (or equivalent graduate-level biostatistics)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Journal Clubs and Seminar Series</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Electives from the following list, chosen with advice of student's advisory committee</td>
<td>20 maximum</td>
</tr>
</tbody>
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### Signature Electives

- Cancer & Stem Cell Biology, Diagnostics and Therapeutics: 4
- CB 516 Reprod & Dev Toxicology: 3
- CB 520 Models in Biomedical Research: 2
- PATH 515 Mechanisms Microbial Infection: 3 or 4
- PATH 516 Epidemiology Infectious Dis: 3
- PATH 550 Concepts in Pathology: 4
- VCM 524 Effective Biomedical Teacher: 3

### Programmatic Electives, chosen with advice of student's advisory committee

- CB 449 Basic Toxicology: 3
- CB 467 Fund Phar Discovery & Dev: 2
- CB 554 Systems Toxicology: 3
- CB 512 Advanced Endocrinology: 2
- CB 514 Neurotoxicology: 3
- CB 540 Wildlife Ecosystem Health: 1 or 2
- CB 550 Detect/Anal Gene Transcripts: 4
- CB 551 Ecotoxicology North Hemisphere: 1
- CB 552 Ethics in Toxicology: 1
- CB 564 Comp Clinical Pharmacology: 3
- CB 594 Comparative Bioscience: 1 to 4
- CB 596 Interdisciplinary Tox Sem: 1
- PATH 514 Molc Mech Bact Pathogenesis: 2
- PATH 517 Principle/Method Epidemiology: 4
- PATH 519 Mechanisms Viral Pathogenesis: 3
- PATH 527 Parasitology/Epidemiology Sem: 1
- PATH 528 Multivariate Biostatistics: 4
- PATH 544 Immunobiological Methods: 3
- PATH 591 Design/Analysis Biomed Exper: 4
- VCM 502 Issues in Clinical Research: 2
- VCM 508 Trans Mol Path Veterinary Dz: 3
- VCM 510 Science of Animal Well-Being: 1.5
- VM 551 Introductory surgery for Research: 4
- VM 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 maximum
- Additional credits inside or outside biomedical fields: 7 maximum
- Special problems: 12 maximum

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Thesis research 20 maximum per semester

### TOTAL HOURS REQUIRED

96

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1. Laboratory Rotation required of incoming students without an identified research advisor, optional but encouraged of all other students.

2. 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 defence required: Yes
- Dissertation deposit required?: Yes