ANIMAL SCIENCES (ANSC)

Graduate Degree Program
College: Agriculture and Natural Resources

Abstract
The Graduate Program in the Animal Sciences offers graduate study leading to the Master of Science and Doctor of Philosophy degrees. The master's degree program does not offer the non-thesis option. Faculty research interests include:

1. Cell, molecular and developmental biology studies, gene expression of the neuroendocrine system during growth and development, molecular genetics of metal and heme homeostasis in animals, maintenance of pluripotency and cell lineage determination in early embryos and embryonic stem cells, regulation of gene expression during embryonic patterning, neuro- and reproductive endocrinology in avian species, and virology, immunology and microbial pathogenesis of significance to animal agriculture;
2. Nutrition and intermediary metabolism of ruminants and non-ruminants, regulation of milk fat production in dairy cattle, modeling for nutrient management, nutrient management in avian and other monogastric species, including forage utilization in horses; nutritional immunology, nutrient sensing, metabolic homeostasis, companion and exotic animal nutrition;
3. Aquaculture related fish physiology and cryopreservation of germ cells, and;
4. Application of computational and systems biology to quantitative genetics, genomics, epigenetics, selection theory and breeding for the improvement of domestic animals and conservation genetics.

Financial Assistance
A number of graduate combined research/teaching assistantships are available and awarded to students who present strong academic records and a capability and motivation to perform well in teaching or in research assignments. These assistantships are awarded on a competitive basis. Appointments are on an annual basis, with reappointment contingent on demonstration of successful progress towards the degree. Assistantships are available for up to two years for the M.S. degree and four years for the Ph.D. degree. As assistantships are generally awarded for Fall admittance, applications should be completed by the January 15 deadline for consideration.

Contact
For specific information on the program, admission procedures, or financial aid, see the ANSC website (http://ansc.umd.edu/graduate) or contact the ANSC graduate program office as listed below.

Dr. Carol L. Keefer
Professor and Director, Graduate Program in Animal Sciences
Department of Animal and Avian Sciences
2129 Animal Sciences Center
8127 Regents Drive
University of Maryland
College Park, MD 20740
Telephone: 301.405.5781
Email: ansc-gradprogram@umd.edu

Victoria Lake

ANSC Graduate Office
Department of Animal and Avian Sciences
1415A Animal Sciences Center
8127 Regents Drive
University of Maryland
College Park, MD 20740
Telephone: 301.405.5781
Email: ansc-gradprogram@umd.edu

Website: http://www.ansc.umd.edu


Admissions
General Requirements
- Statement of Purpose
- Transcript(s)
- TOEFL/IELTS/PTE (international graduate students (https://gradschool.umd.edu/admissions/english-language-proficiency-requirements))

Program-Specific Requirements
- Letters of Recommendation (3)
- Graduate Record Examination (GRE)
-CV/Resume

The Program requires applicants to submit an application online, and to submit official academic transcripts, statement of goals and research interests, at least three letters of recommendation, and official Graduate Record Examination scores to the Enrollment Services Operations Office. Applicants with degrees from non-English speaking countries and who have not received a degree from the list of approved English-speaking universities must also submit results of the Test of English as a Foreign Language (TOEFL). To be considered for an assistantship, submit your application by the preferred deadline.

For more admissions information or to apply to the program, please visit our Graduate School website: www.gradschool.umd.edu/admissions

Application Deadlines

<table>
<thead>
<tr>
<th>Type of Applicant</th>
<th>Fall Deadline</th>
<th>Spring Deadline</th>
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<tbody>
<tr>
<td>Domestic Applicants</td>
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<tr>
<td>US Citizens and Permanent</td>
<td>15 May</td>
<td>14 Dec</td>
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<tr>
<td>Residents</td>
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<tr>
<td>International Applicants</td>
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<tr>
<td>F (student) or J (exchange</td>
<td>15 Mar</td>
<td>28 Sep</td>
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<td>visitor) or L visas</td>
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<tr>
<td>visas and immigrants</td>
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Off Campus Research Facilities include:

- Central Core Facilities on the campus.
- Core Facility, etc., are available to the faculty and students as part of the Visual Imaging Center, the DNA Sequencing Laboratory, the Proteomics Other facilities, such as the Laboratory for Biological Ultrastructure, the Laboratory for Biomedical Imaging, the DNA Sequencing Laboratory, the Proteomics Core Facility, etc., are available to the faculty and students as part of the Central Core Facilities on the campus.

Off Campus Research Facilities include:

1. University of Maryland/USDA-Beltsville Animal Biotechnology Facility
   An 11,000 square foot cooperative facility for research in animal biotechnology at the Beltsville Agricultural Research Center. This Center includes laboratories specifically designed for research in cloning and transgenic biology. ANSC faculty engaged in cloning, stem cell and transgenic biotechnology may use this facility to investigate genes of significance for the growth, development and physiology of domestic animals.

2. Central Maryland Research and Education Center, Clarksville, MD
   This 925-acre dairy research center, located ~25 miles from the campus, houses 200 head of Holstein dairy cattle including 110 milking cows and 90 head of young stock. ANSC faculty engaged in nutrition, reproduction, physiology, herd health, behavior and management research, conduct their experiments at this facility.

3. Applied Poultry Research Laboratory, Upper Marlboro, MD
   This 202-acre facility is located approximately 20 miles from the campus. It is used for conducting research in nutrition, physiology and behavior.

4. Wye Beef Cattle Research Center
   This 450-acre facility is located on Maryland's Eastern Shore near Queenstown. It has 250 registered Angus beef cows plus young stock and bulls which are direct descendants of the Wye Angus herd. The facility is used to support research associated with beef cow-calf management, pasture management and growth physiology.

Facilities and Special Resources

The Department of Animal and Avian Sciences and the nearby Gudelsky Veterinary Center housing the Virginia-Maryland Regional College of Veterinary Medicine, have extensive facilities consisting of faculty research laboratories, animal holding areas, a campus farm, aquaculture facility and outlying research farms. Additionally, the department maintains two computer laboratories with 30 workstations in the teaching laboratory, and a smaller laboratory exclusively for the use of graduate students on a 24 hour basis.

The research laboratories comprise nearly 28,000 square feet for bench work, averaging over 1000 square feet per faculty member. Over 2800 square feet of cold room and 2000 square feet of freezer rooms are integral components of the research laboratories. The laboratories are fully equipped with state-of-the-art modern instrumentation and equipment for the entire range of research carried out by the faculty, e.g. research in biochemistry, cell-molecular biology, physiology, nutrition, behavior, virology, immunology, microbial pathogenesis etc. Individual laboratories are fully self-standing units, yet there is free exchange between laboratories having shared and collaborative interests. All the laboratories and offices are networked to the campus server for direct Internet access.

Nearly 15,000 square feet of space is dedicated for animal holding in the Animal Wing of the Animal Sciences Center. This facility is capable of handling all kinds of animals such as rodents, birds, fish and large animals for research in separate rooms. A new aquaculture facility, adjoining the Gudelsky Center, is also available. The Animal Wing is under the care of trained staff and is supervised by a professional veterinarian.

Other facilities, such as the Laboratory for Biological Ultrastructure, the Visual Imaging Center, the DNA Sequencing Laboratory, the Proteomics Core Facility, etc., are available to the faculty and students as part of the Central Core Facilities on the campus.

Requirements

- Animal Sciences, Master of Science (M.S.) (https://academiccatalog.umd.edu/graduate/programs/animal-sciences-ansc/animal-sciences-ms)

Faculty

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First/Middle Name</th>
<th>Graduate Faculty Status</th>
<th>Academic Credentials</th>
<th>Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angel</td>
<td>C. Roselina</td>
<td>Full Member</td>
<td>B.S., Iowa State University, 1984; M.S., 1987; Ph.D., 1990.</td>
<td>Professor, Animal Sciences</td>
</tr>
<tr>
<td>Baldwin</td>
<td>Ransom</td>
<td>Adjunct Member</td>
<td>B.S., University of California, Davis, 1987; M.S., University of California, Davis, 1988; Ph.D., Rutgers University, 1992</td>
<td>Adjunct Associate Professor, Animal Sciences</td>
</tr>
<tr>
<td>Biswas</td>
<td>Debabrata</td>
<td>Full Member</td>
<td>B.S., University of Dhaka, 1994; M.S., University of Tokyo, 1998; Ph.D., University of Tokyo, 2001</td>
<td>Assistant Professor, Animal Sciences</td>
</tr>
<tr>
<td>Burk</td>
<td>Amy O.</td>
<td>Full Member</td>
<td>B.S., James Madison University, 1995; M.S., Virginia Polytechnic Institute and State University, 1998; Ph.D., Virginia Polytechnic Institute and State University, 2001</td>
<td>Associate Professor, Animal Sciences</td>
</tr>
</tbody>
</table>
Comizzoli Pierre  Adjunct Member  D.V.M., Veterinary College of Maisons-Alfort, 1994; M.S., University of Paris VI, 1997; Ph.D., University of Tours, 2000.  

Connor Erin E.  Adjunct Member  B.S., University of Maryland College Park, 1989; M.S., Virginia Polytechnic Institute and State University, 1993; Ph.D., University of Maryland College Park, 1999. 

Dennis Rachel  Full Member  Assistant Professor, Animal Sciences 

Driscoll Cindy  Adjunct Member  Adjunct Associate Professor, Animal Sciences 

Erdman Richard E.  Full Member  B.S., University of Wisconsin-River Falls, 1974; M.S., University of Kentucky, 1977; Ph.D., 1979. 

Hamza Iqbal  Full Member  B.S., Bombay University, 1989; M.S., 1991; Ph.D, SUNY, Buffalo, 1998 

Keefer Carol L.  Full Member  B.S., University of South Carolina, 1974; Ph.D, University of Delaware, 1981 

Kim Byung-Eun  Full Member  B.S., Kangwon National University, Microbiology, 1993; M.S., Kangwon National University, Microbiology, 1996; Ph.D., University of Missouri-Columbia, Genetics, 2004 

Kohn Richard A.  Full Member  B.S., Cornell University, 1985; M.S., University of New Hampshire-Durham, 1987; Ph.D., Michigan State University, 1993. 

Kohn Richard A.  Full Member  Assistant Professor, Animal Sciences 

Ma Li  Full Member  B.S., Fudan University, China, 2002; M.S., University of Minnesota, 2010; Ph.D., University of Minnesota, 2010 

Mather Ian H.  Full Member  B.Sc., University of Wales, 1966; Ph.D., 1971. 

Moyes Kasey  Full Member  B.S., Michigan State University, 2001; M.S., University of Connecticut, 2004; Ph.D., University of Illinois, 2008
Ottinger  Mary A.  Full Member  
B.S., University of Maryland-College Park, 1972; M.S., 1974; Ph.D., 1977.

Peters  Robert R.  Full Member  
B.S., University of Minnesota-St. Paul, 1973; M.S., 1975; Ph.D., Michigan State University, 1980.

Porter  Tom E.  Full Member  

Pukazhenthi  Budhan  Adjunct Member  
B.V.Sc., Madras Veterinary College, 1987; M.S., University of Maryland College Park, 1992; Ph.D., University of Maryland College Park, 1996.

Song  Jiuzhou  Full Member  
<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Degree, Institution, Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woods</td>
<td>L. Curry, III</td>
<td>B.S., Murray State University, 1975; M.S., Ohio State University-Columbus, 1977; Ph.D., North Carolina State University, 1983.</td>
</tr>
<tr>
<td>Xiao</td>
<td>Zhengguo</td>
<td>D.V.M., Nanjing Agricultural University, 1988; M.S., Nanjing Agricultural University, 1991.</td>
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