Animal Biology (A Graduate Group)

Trish Berger, Ph.D., Interim Chairperson of the Group

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Faculty

Danika L. Bannasch, Ph.D., Associate Professor (Population Health and Reproduction; School of Veterinary Medicine)

Rebecca Bellone, Ph.D., Associate Adjunct Professor (Population Health and Reproduction; School of Veterinary Medicine)

Trish Berger, Ph.D., Professor (Animal Science)

Chris C. Calvert, Ph.D., Professor, Emeriti Faculty (Animal Science)

Bruce W. Christensen, D.V.M., Assistant Professor (Population Health and Reproduction; School of Veterinary Medicine)

Alan J. Conley, Ph.D., Professor (Population Health and Reproduction; School of Veterinary Medicine)

Richard E. Cannon, Ph.D., Assistant Adjunct Professor (Anatomy, Physiology & Cell Biology; School of Veterinary Medicine)

James G. Fadel, Ph.D., Professor (Animal Science)

Nann A. Fargue, Ph.D., Assistant Professor (Wildlife, Fish, and Conservation Biology)

Andrea J. Fassetti, V.M.D., Ph.D., Professor (Molecular Biosciences; School of Veterinary Medicine)

Carrie Finno, Ph.D., Assistant Professor (Population Health and Reproduction; School of Veterinary Medicine)

Janet Foley, Ph.D., Professor (Medicine & Epidemiology; School of Veterinary Medicine)

Rodrigo Gallardo, Ph.D., Assistant Professor (Poultry Medicine; School of Veterinary Medicine)

Matthias Hess, Ph.D., Assistant Professor (Animal Science)

Russell C. Hovey, Ph.D., Professor (Animal Science)

Amy S. Kapalkin, D.V.M., Professor (Surgical & Radiological Sciences; School of Veterinary Medicine)

Ermias Kebreab, Ph.D., Professor (Animal Science)

Kirk C. Klausing, Ph.D., Professor (Animal Science)

Dietmar Kuehl, Ph.D., Professor (Animal Science)

Yanyang Liu, Ph.D., Assistant Professor (Animal Science)

Elizabeth Maga, Ph.D., Associate Researcher and Lecturer (Animal Science)

Brenda J. McCowan, Ph.D., Professor (Veterinary Medicine Teaching and Research Center and California National Primate Research Center)

Juan F. Medrano, Ph.D., Professor (Animal Science)

Deanne Meyer, Ph.D., Specialist in Cooperative Extension and Lecturer (Animal Science)

Stuart Meyers, Ph.D., Professor (Anatomy, Physiology and Cell Biology; School of Veterinary Medicine)

Mike Miennalowksi, Ph.D., Assistant Professor (Animal Science)

Michael R. Miller, Ph.D., Assistant Professor (Animal Science)

Frank M. Millocher, Ph.D., Associate Professor (Animal Science)

James D. Murray, Ph.D., Professor (Animal Science)

Anita M. Oberbauer, Ph.D., Professor (Animal Science)

James W. Oljen, Ph.D., Specialist in Cooperative Extension and Lecturer (Animal Science)

Peter H. Robinson, Ph.D., Specialist in Cooperative Extension and Lecturer (Animal Science)

Jan F. Roser, Ph.D., Professor, Emeriti Faculty (Animal Science)

Pablo J. Ross, Ph.D., Associate Professor (Animal Science)

Heidi A. Rossow, Ph.D., Assistant Professor (Population, Health, and Reproduction; School of Veterinary Medicine)

Benjamin N. Sacks, Ph.D., Associate Adjunct Professor (Population, Health, and Reproduction; School of Veterinary Medicine)

Roberto D. Sainz, Ph.D., Professor (Animal Science)

Susan A. Stover, D.V.M., Ph.D., Professor (Anatomy, Physiology, and Cell Biology; School of Veterinary Medicine)

Brian D. Todd, Ph.D., Associate Professor (Wildlife, Fish, and Conservation Biology)

Anne Todgham, Ph.D., Assistant Professor (Animal Science)

M. Cecilia Torres-Penedo, Ph.D., Associate Research Geneticist (Veterinary Genetics Laboratory; School of Veterinary Medicine)

Cassandra B. Tucker, Ph.D., Associate Professor (Animal Science)

Alison L. Van Eenennaam, Ph.D., Specialist in Cooperative Extension and Lecturers (Animal Science)

Jason Walters, Ph.D., Associate Adjunct Professor (Animal Science)

Haoqian Zhou, Ph.D., Associate Professor (Animal Science)

Richard A. Zinn, Ph.D., Professor (Animal Science; located at Desert Research and Extension Center)

Graduate Study. The Graduate Group in Animal Biology offers programs of study and research leading to the M.S. and the Ph.D. degrees. The Animal Biology Graduate Group focuses on integrated animal biology. Each student independently tailors her/his program of study to meet individual needs. The Animal Biology Graduate Group is unique in encouraging a multidisciplinary or interdiscipliary approach involving physiology, nutrition, genetics, ecology, and/or behavior within the context of organismal animal biology.

Preparation. Applicants should have undergraduat3epreparation in a field appropriate to the course of study selected, including upper division coursework in most of the following subjects: biochemistry, genetics, nutrition, physiology, and integrative animal biology such as animal management.

Graduate Advisers. R.C. Hovey, E.A. Maga, C.B. Tucker, J.D. Murray, E.Kebreab, P.J. Ross

Courses in Animal Biology (ABG)

Graduate

200A. Integrated Animal Biology I (3)
Lecture/discussion—3 hours. Prerequisite: graduate standing; Biological Sciences 101 or equivalent or consent of instructor. Class size limited to 20 students. Pass One restricted to Animal Biology Graduate Group students. Natural history, management, historical and current uses, and specialized disciplinary features of model and novel animal systems used in research. Development of conceptual approaches in organismal biology to improve experimental design and interpretation of interdisciplinary research studies. (F) (Su)
Conceptual approaches in organismal biology to improve experimental design and interpretation of interdisciplinary studies. - S. J. Berger

202. Grant Procurement and Administration (2)
Lecture—1 hour, discussion/laboratory—1 hour. Prerequisite: course 200B. Class size limited to 12 graduate students. Pass/No Pass. Restricted to Animal Biology Graduate Group students. Topics include: structuring of grants, attention to specifications, concisely persuasive writing, and grant budgeting. May be repeated for credit. (S/U grading only.)—F. (F.) Cannon

250. Mathematical Modeling in Biological Systems (4)
Lecture/discussion—4 hours. Prerequisite: graduate standing, Mathematics 16A, 16B, or equivalents required; Mathematics 16C or equivalent recommended; Statistics 100 or equivalent required; more than one course in statistics recommended. Lecture 102 or Biological Sciences 102 recommended or equivalent course in biochemistry. Limited enrollment. Model development and evaluation including sensitivity analyses using R. Four principle modeling methodologies included: algebraic functions of biological processes, physiological-based compartmental models, linear programming and metabolic models. Fundamental background and understanding of mathematical modeling principles in biological systems.—W. (W.) Fadel, Kebreab

255. Physiology of the Stress Response (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing, Definition of Stress; Physiological mechanisms of adaptation to stress; Hormonal control of the systemic stress response; Mechanisms of the cellular stress response; Discussion of current trends in stress physiology and current methods for studying the stress response. [Same course as Molecular, Cellular, and Integrative Physiology 255.—S. (S.) Kuftz]

290. Seminar in Animal Biology (1)
Seminar—1 hour. Prerequisite: graduate standing. Seminar on advanced topics in animal biology. Presentations by members of the Animal Biology Graduate Group and guest speakers. May be repeated for credit. (S/U grading only)—F. W. S. (F. W. S.)

290C. Research Conference (1)
Discussion—1 hour. Prerequisite: graduate standing and consent of instructor. Student presentations of research in Animal Biology and discussions among participating students and Animal Biology faculty. May be repeated for credit. (S/U grading only)—F. W. S. Su. (F. W. S. Su.)

298. Group Study in Animal Biology (1-5)
Prerequisite: graduate standing; consent of instructor. May be repeated for credit. (S/U grading only)—F. W. S. Su. (F. W. S. Su.)

299. Research (1-12)
Prerequisite: graduate standing and consent of instructor. Restricted to faculty member in Animal Biology Graduate Group. May be repeated for credit. (S/U grading only)—F. W. S. Su. (F. W. S. Su.)

Professional

300. Methods in Teaching Animal Biology (2)
Lecture/discussion—2 hours. Prerequisite: graduate standing and consent of instructor. Practical experience in the methods and problems of teaching animal biology. Includes analysis of laboratory exercises, discussion of teaching techniques, grading scientific essays, preparing for and conducting discussion or laboratory sections, formulating quiz and exam questions under instructor supervision. May be repeated for a total of three times for credit. (S/U grading only)—F. W. F. W. Famula, Oberbauer

396. Teaching Assistant Training Practicum (1-4)
Variable—3-12 hours. Prerequisite: graduate standing and consent of instructor. May be repeated for credit. (S/U grading only)—F. W. S. (F. W. S.)

Professional

401. Ethics and Professionalism in Animal Biology (2)
Discussion—2 hours. Restricted to graduate standing; Pass/No Pass. Restricted to Animal Biology group students. Case studies and discussion of ethical and professional issues for animal biologists, including the use of animals in research and teaching, patenting of intellectual property, consulting and conflict of interest, scientific integrity, dealing with the media, and mentoring relationships. Offered in alternate years.—F. (F.) Menden

Animal Genetics

(College of Agricultural and Environmental Sciences) Faculty. See under Department of Animal Science, on page 162.

Major Program.

See the major in Animal Science, on page 162.

Related Courses.

See Biological Sciences 101, 101D; Evolution and Ecology 102, 175; Genetics Graduate Group courses; Microbiology 150, 170, 215, 260, 274, 292; Molecular and Cellular Biology 121, 141, 160L, 161, 162, 163, 164, 178, 182, 221C, 257, 262, 263; Neurobiology, Physiology, and Behavior 131; Plant Biology 151, 152, 154, 161A, 161B; Plant Pathology 215X, 217; Plant Sciences 220, 221.

Courses in Animal Genetics (ANG)

Questions pertaining to the following courses should be directed to the instructor or to the Animal Science Advising Center in 1070 Meyer Hall 530-754-7915.

Upper Division

101. Animal Cytogenetics (3)
Lecture/discussion—1 hour; laboratory—6 hours. Prerequisite: Biological Sciences 101, 102 or the equivalent. Principles and techniques of cyto genetics applied to animal systems; chromosome harvest techniques, analysis of mitosis and meiosis, karyotyping, chromosome banding, cytogenetic mapping, chromosome structure and function, comparative cytogenetics. GE credit: SciEng ISE.

105. Horse Genetics (2)
Lecture—2 hours. Prerequisite: Animal Science 15; Biological Sciences 101. Coat color, parentage testing, medical genetics, pedigrees, breeds, the gene map and equine Equus. Emphasis on understanding horse genetics based on the unity of mammalian genetics and making breeding decisions based on fundamental genetic concepts. GE credit: SciEng ISE.

107. Genetics and Animal Breeding (5)
Lecture—4 hours; laboratory—3 hours. Prerequisite: Biological Sciences 101. Principles of quantitative genetics applied to improvement of livestock and poultry. Effects of mating systems and selection methods are emphasized with illustration from current breeding practices. GE credit: SciEng ISE.—F. W. F. W. Medrano, Miller

111. Molecular Biology Laboratory Techniques (4)
Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1C, 101, 102, 103. Introduction to the concepts and techniques used in molecular biology; the role of this technology in both basic and applied animal research, and participation in laboratories using some of the most common techniques in molecular biology. GE credit: SciEng ISE.—F. W. F. W. Medrano, Miller

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. Selected topics relating to animal genetics. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. (P/NP grading only)

Graduate

204. Theory of Quantitative Genetics (3)
Lecture—3 hours. Prerequisite: course 107 or the equivalent. Theoretical basis of quantitative genetics and the consequences of Mendelian inheritance. Concepts used to estimate quantitative genetic differences and bases for partitioning the phenotypic variance.

206. Advanced Domestic Animal Breeding (3)
Lecture—3 hours. Prerequisite: course 107 and Animal Science 205; course 204 recommended. Procedures for the genetic evaluation of individuals to include selection indices and mixed model evaluation for single and multiple traits. Methods of estimating genetic trends. Offered in alternate years.

208. Estimation of Genetic Parameters (3)
Lecture—3 hours. Prerequisite: course 107 and Animal Science 205; courses 204 and 108 recommended. General methods for the estimation of components of variance and covariance and their application to the estimation of heritability, repeatability and genetic correlations are considered. Specific emphasis is given to procedures applicable to livestock populations under selection.

211. Genetic Engineering of Animals (2)
Lecture—1 hour; lecture/discussion—1 hour. Review of techniques for the genetic engineering of animals and their limitations and applications. Student discussions of recent papers in the field and possible future applications of genetically engineered animals in basic research and applied agricultural and medical research. (S/U grading only)—M. Murray

212. Sequence Analysis in Molecular Genetics (2)
Lecture/laboratory—2 hours. Prerequisite: Biological Sciences 101 or the equivalent; graduate standing or consent of instructor. Use of computer algorithms and online databases to analyze nucleic acid and protein sequences in molecular genetics research.—Medrano

298. Group Study (1-5)
Prerequisite: consent of instructor. Lectures and discussions of advanced topics in animal genetics. (S/U grading only.)

299. Research in Animal Genetics (1-12)
Prerequisite: consent of instructor. (S/U grading only)

Animal Physiology

See Animal Biology, on page 160; Animal Science, on page 162; Neurobiology, Physiology, and Behavior, on page 478; and Molecular, Cellular, and Integrative Physiology (A Graduate Group), on page 466.

Animal Science

(College of Agricultural and Environmental Sciences) Anita M. Oberbauer Ph.D., Chairperson of the Department

Department Office. 2223 Meyer Hall 530-753-1470; http://www.asac.ucdavis.edu

Master Adviser. E.J. DePeters Undergraduate Advising. 1202 Meyer Hall 530-754-7915; http://asac.ucdavis.edu

Advising Center for the major, minors and course offerings (including peer advising) is located in the Animal Science Advising Center in 1202 Meyer Hall 530-754-7915. Each student will be assigned a faculty adviser through this office upon entering the major.