

DEPARTMENT OF BIOLOGY

203 DeGrace Hall
Phone: 216.368.3557; Fax: 216.368.4672
Michael F. Benard, Department Chair
mfb38@case.edu

More Information: <https://www.case.edu/artsci/biol>

The mission of the Department of Biology at Case Western Reserve University is to promote research programs of national and international prominence and to provide strong undergraduate and graduate educational programs that emphasize integrative approaches to biological problems. In doing so, our programs support preparation and professional development for careers related to the biological and health sciences.

The department offers courses leading to the degrees of Bachelor of Science, Bachelor of Arts, Master of Science, and Doctor of Philosophy. Cooperative programs between the Department of Biology and the Case Western Reserve University School of Medicine, the Cleveland Museum of Natural History, the Cleveland Botanical Garden, the Cleveland Metroparks Zoo, the Holden Arboretum, the Cleveland Institute of Art, and other departments in Case Western Reserve University significantly extend the range of resources available to biology students. The department also operates an extensive field research station at Squire Valleeview Farm, located about 10 miles east of the University. Undergraduate students are encouraged to conduct individually supervised research projects with biology faculty and with faculty in cooperating departments. A supervised research project is required of all students in the Biology BS and Neuroscience BS programs.

The undergraduate programs in biology provide excellent preparation for graduate or professional schools, including medical, dental, and veterinary schools and the many specialized graduate programs in the biological sciences. A biology degree also prepares students for careers in industry and government. For students interested in biotechnology—a field with growing career opportunities—the department offers elective sequences within the BA and BS degrees.

In addition to formal courses for credit, the department offers weekly seminars during the academic year, presenting recent advances in biology. These seminars are held every Thursday at 4:00 p.m. and are open to the university community.

Department Faculty

Michael F. Benard, PhD
(University of California, Davis)
Associate Professor; Department Chair
Ecology; evolutionary biology

Karen C. Abbott, PhD
(University of Chicago)
Professor
Ecology; theoretical biology

Radhika Atit, PhD
(University of Cincinnati)
Professor
Developmental biology and genetics; origin and patterning of skin

Sarah C. Bagby, PhD
(Massachusetts Institute of Technology)
Assistant Professor
Microbial and viral evolution and community dynamics; geobiology; microbial physiology; bioinformatics and ecoinformatics

Rebecca Benard, PhD
(University of California, Davis)
Senior Instructor; Associate Dean, College of Arts and Sciences
Plant population ecology; physiology

Susan M. Burden-Gulley, PhD
(Case Western Reserve University)
Senior Instructor
Neuroscience; axonal growth; neural development; brain cancer

Jean H. Burns, PhD
(Florida State University)
Professor
Plant ecology; community assembly; invasibility; the role of phylogeny in assembly; the role of demographic processes in biological invasions

Arnold I. Caplan, PhD
(Johns Hopkins University)
Professor; Director, Skeletal Research Center
Developmental biology and biochemistry; molecular and cellular aspects of muscle, cartilage, and bone development

Leena Chakravarty, PhD
(Ohio State University)
Instructor
Microbial molecular genetics

Hillel J. Chiel, PhD
(Massachusetts Institute of Technology)
Professor
Neurobiology and animal behavior; cellular dynamics of neuronal computation

Nicole Crown, PhD
(Indiana University)
Assistant Professor
Molecular genetics of meiosis in *Drosophila melanogaster*

Christopher A. Cullis, PhD
(University of East Anglia, United Kingdom)
Francis Hobart Herrick Professor of Biology
Plant molecular biology and genetics; modifications of the information content of plant cells

Sarah E. Diamond, PhD
(University of North Carolina, Chapel Hill)
Associate Professor
Evolutionary ecology; global change biology; invertebrate immunology; multivariate statistics

Angela Dixon, PhD
(University of Michigan)
Assistant Professor
Nervous system; olfactory system; biohybrid technologies; in-vitro tissue and organ models; microfluidic models; patterned cell cultures

Richard F. Drushel, PhD
(Case Western Reserve University)
Senior Instructor
Vertebrate anatomy and physiology; kinematic modeling and neural control; autonomous robotics

Yolanda M. Fortenberry, PhD
(Louisiana State University School of Medicine)
Associate Professor
Regulation of blood coagulation; development of RNA aptamers as anticoagulants and for treatment of sickle cell disease

Jessica L. Fox, PhD
(University of Washington)
Professor
Neurobiology of behavior

Elliot M. Gardner, PhD and JD
(Northwestern University and Chicago Botanic Garden; Benjamin N. Cardozo School of Law)
Assistant Professor
Plant systematics; phylogenetics; ethnobotany; pollination biology and chemical ecology; flora of Southeast Asia

Abdel H. Halloway, PhD
(University of Illinois at Urbana-Champaign)
Assistant Professor
Ecology, Evolution, Mathematical biology

Stephen E. Haynesworth, PhD
(Case Western Reserve University)
Associate Professor; Director, The Emerging Scholars Program
Developmental and aging biology

Valerie Haywood, PhD
(University of California, Davis)
Senior Instructor
Plant developmental biology; molecular biology

Emmitt R. Jolly, PhD
(University of California, San Francisco)
Professor
Molecular biology and genetics; developmental biology; parasitology; schistosomiasis

Barbara A. Kuemerle, PhD
(Case Western Reserve University)
Senior Instructor
Molecular biology and genetics; developmental neuroscience

Ryan A. Martin, PhD
(University of North Carolina, Chapel Hill)
Associate Professor
Evolutionary ecology; behavioral ecology; ecology's role in evolutionary diversification; causes and consequences of phenotypic plasticity

Claudia M. Mizutani, PhD
(Federal University of Rio de Janeiro, Brazil)
Associate Professor
Developmental biology and genetics; embryonic body-axis formation

Ronald G. Oldfield, PhD
(University of Michigan)
Senior Instructor
Evolutionary ecology of cichlid fishes; ichthyology

Charles E. Rozek, PhD
(Wayne State University)
Associate Professor; Vice Provost for Graduate Education and Faculty and Academic Affairs; Dean of Graduate Studies
Molecular genetics; developmental biology

Robin Snyder, PhD
(University of California, Santa Barbara)
Professor
Theoretical ecology

Joy K. Ward, PhD
(Duke University)
Professor; Interim Provost
Plant biology; climate change

Robert E. Ward, PhD
(Duke University)
Associate Professor
Developmental biology; cell biology; model system genetics

Mark A. Willis, PhD
(University of California, Riverside)
Professor
Neurobiology and behavior; sensorimotor control of insect flight; animal behavior

Gabriella Wolff, PhD
(University of Arizona)
Assistant Professor
Neuroethology; evolutionary and comparative neurobiology; olfaction; learning and memory

Research Faculty

Rodrigo Somoza Palacio, PhD
(Universidad Federico Santa Maria, Chile)
Research Associate Professor
Cartilage tissue engineering; somatic stem cell biology; reprogramming technology (IPS); cell therapy and tissue regeneration; cancer metastasis

Jean F. Welter, MD, PhD
(Leopold Franzens Universität, Austria; Case Western Reserve University)

Research Associate Professor
Tissue engineering and cell-based therapies; bioreactor design; mechanobiology; bone transplantation; imaging; fluorescence spectroscopy; drug delivery

Secondary Faculty

Martín L. Basch, PhD
(California Institute of Technology)
Assistant Professor, Department of Otolaryngology, University Hospitals of Cleveland

Neurobiology; hearing and deafness; mechanotransduction; synapse development

Darin Croft, PhD
(University of Chicago)
Professor, Department of Anatomy, School of Medicine
Vertebrate paleontology and fieldwork; mammals, especially those of South America; paleoecology and ancient ecosystems

Brian M. McDermott, PhD
(Columbia University)
Associate Professor, Department of Otolaryngology, University Hospitals of Cleveland

Neurobiology; hearing and deafness; zebrafish; mechanotransduction; synapse development

Timothy J. Mead, PhD
(University of Cincinnati College of Medicine)
Assistant Professor, Department of Pediatrics, School of Medicine
Developmental Biology

Scott W. Simpson, PhD
(Kent State University)
Professor, Department of Anatomy, School of Medicine
Hominin paleontology and fieldwork; hominid dentition; locomotor capacities of early *Homo erectus*

Peter Thomas, PhD
(University of Chicago)
Professor, Department of Mathematics, Applied Mathematics, and Statistics
Synchronization and reliability of neural activity; gradient sensing, signal transduction and information theory; pattern formation in the visual cortex; malaria informatics

Peter A. Zimmerman, PhD
(Case Western Reserve University)
Professor, Center for Global Health and Diseases, School of Medicine
Infectious diseases; genetics, genomic epidemiology and evolution

Adjunct Faculty

James Bader, MS
(Case Western Reserve University)
Adjunct Lecturer; Executive Director, Gelfand STEM Center
STEM education; aquatic biology

David J. Burke, PhD
(Rutgers University)
Adjunct Assistant Professor; Scientist, Holden Arboretum
Rhizosphere ecology; plant-microbe interactions; molecular microbial ecology; plant ecology

Caitlin Colleary, PhD
(Virginia Tech)
Adjunct Assistant Professor; Assistant Curator of Vertebrate Paleontology, Cleveland Museum of Natural History
Taphonomy; fossilization; molecular preservation

Pam Dennis, PhD, DVM
(Ohio State University; College of Veterinary Medicine, North Carolina State University)
Adjunct Assistant Professor; Clinical Assistant Professor, Cleveland Metroparks Zoo
Veterinary wildlife epidemiology in zoo and free-ranging animal populations

Nancy Dilulio, PhD
(Pennsylvania State University College of Medicine)
Adjunct Instructor; Senior Associate Dean, Undergraduate Studies
Cell biology; biochemistry

Michael P. Donovan, PhD
(Pennsylvania State University)
Adjunct Assistant Professor; Senior Collections Manager of Paleobotany and Paleocology, Cleveland Museum of Natural History
Paleobotany; evolution and ecology of plant-insect interactions

Noah T. Dunham, PhD
(Ohio State University)
Adjunct Assistant Professor; Research Curator, Cleveland Metroparks Zoo
Primate behavior; nutritional ecology; locomotor kinematics

Nicole L. Gunter, PhD
(University of Queensland, Australia)
Adjunct Assistant Professor; Collections Manager, Department of Invertebrate Zoology, Cleveland Museum of Natural History
Phylogenetics and systematics of dung beetles

Diana C. Koester, PhD
(George Mason University)
Adjunct Assistant Professor; Research Curator, Cleveland Metroparks Zoo
Wildlife endocrinology; reproductive physiology; animal welfare

Christopher Kuhar, PhD
(Georgia Institute of Technology)
Adjunct Assistant Professor; Executive Director, Cleveland Metroparks Zoo
Conservation and education program evaluation; experimental psychology; animal behavior

Kristen E. Lukas, PhD
(Georgia Institute of Technology)
Adjunct Assistant Professor; Curator, Conservation and Science, Cleveland Metroparks Zoo
Applied animal behavior; behavior and health; visitor attitudes and behavior

Juliana S. Medeiros, PhD
(University of New Mexico)
Adjunct Assistant Professor; Scientist, Holden Arboretum
Plant physiological ecology; evolutionary ecology; acclimation and adaptation to the abiotic environment; carbon and water relations

Katherine L. Stuble, PhD
(University of Tennessee)
Adjunct Assistant Professor; Scientist, Holden Arboretum
<http://www.holdenarb.org/researchstaff/katie-stuble-phd/>
Plant community ecology; plant insect interactions

Gavin J. Svenson, PhD
(Brigham Young University)
Adjunct Assistant Professor; Curator/Head, Department of Invertebrate Zoology, Cleveland Museum of Natural History
Phylogenetics and systematics

Na Wei, PhD
(University of Michigan)
Adjunct Assistant Professor; Scientist, Holden Arboretum
Evolutionary ecology; plant microbiome; population genomics; population ecology

Lecturers

Julie M. Denker, MS
(Case Western Reserve University)
Full-time Lecturer
Anatomy, physiology, molecular techniques

Deborah L. Harris, MS
(Wright State University)
Full-time Lecturer
Aquatic biofouling; mycology

Priyusha Pokala, MS
(Western Kentucky University)
Full-time Lecturer
Microbiology

Emeritus Faculty

Morris Burke, PhD
(University of New South Wales, Australia)
Professor Emeritus
Muscle physiology; protein chemistry

Joseph F. Koonce, PhD
(University of Wisconsin, Madison)
Professor Emeritus
Aquatic ecology; systems ecology

Roy E. Ritzmann, PhD
(University of Virginia)
Professor Emeritus
Neurobiology of behavior; insect locomotion and brain studies

Martin J. Rosenberg, PhD
(State University of New York, Stony Brook)
Senior Instructor Emeritus
Herpetology; vertebrate biology; human anatomy and physiology

Norman B. Rushforth, PhD
(Cornell University)
Professor Emeritus
Epidemiology; animal behavior; population biology

Joanne Westin, PhD
(Cornell University)
Senior Instructor Emerita
Neurobiology and behavior; physiology

Programs

- Biology, BA
- Biology, BS
- Biology, Minor
- Biology, MS
- Biology, PhD
- Evolutionary Biology, BA
- Evolutionary Biology, Minor
- Natural Sciences, BA
- Natural Sciences, Minor
- Neuroscience, BS
- Systems Biology, BS

Dual Degrees

- Programs toward Graduate or Professional Degrees