



EMORY

L A N E Y
GRADUATE
S C H O O L

Population Biology,
Ecology and Evolution



Recent graduate Eleanore Sternberg, Ph.D., current student Zachary Lynch, and PBEE faculty member Jaap De Roode, Ph.D. examining monarch butterflies that they use in their research focused on the ecology and evolution of parasites.

Graduate Division of Biological and Biomedical Sciences

Population Biology, Ecology and Evolution

Population biology studies biological mechanisms across levels of organization from the molecular forces involved in genome evolution to the networks of species in complex ecological systems. Scientists in this challenging field continually cross traditional disciplinary and methodological boundaries to understand the evolution, organization and dynamics of natural populations.

Emory's program in Population Biology, Ecology, and Evolution (PBEE) aims to provide graduate students the multidisciplinary training required for a successful research and teaching career. PBEE faculty and students pursue a broad range of research questions in a wide variety of experimental systems, ranging from bacteria to humans. A focus on the use of quantitative methods and models during research is a central feature that unites our program. This theme is reflected in the design of our core curriculum and the research projects pursued by our students. Our graduate program has six main areas of inquiry that include: Bioinformatics and Biostatistics, Biology of Species Interactions, Disease Ecology, Ecological and Evolutionary Modeling, Genetics of Complex Traits, and Population and Comparative Genomics.

Training for Research

The program is committed to training outstanding researchers capable of original work at the forefront of contemporary interdisciplinary biological science. Coursework provides students with the basic knowledge and skills needed to become self-educating researchers. Most graduate teaching consists of individualized instruction between students and their advisors in a context of cooperative research and discovery.

Students should think of the graduate program not as the next step in their education but as the first step in their professional careers. Almost from the start, students do many of the same things that professional researchers do: read scientific literature; plan, conduct and analyze experiments; write grant proposals; and present and publish the results of their research.

CREATE NEW KNOWLEDGE

Seminar Series

PBEE hosts weekly seminars designed to keep both students and faculty in contact with advanced research taking place in the U.S. and the world. Visitors are invited by a student-faculty committee and represent a broad spectrum of population biology and related fields.

Recent visitors include

- Jerry Coyne, University of Chicago
- Peter Hudson, Penn State University
- Mary Power, University of California at Berkeley
- Karin Pfennig, University of North Carolina
- Cori Richards-Zawacki, Tulane University

Faculty

Program faculty are members of the Emory College of Arts and Sciences (Departments of Anthropology, Biology, Chemistry, Environmental Studies, Psychology, and Physics) the Emory University School of Medicine (Departments of Human Genetics, Medicine, Microbiology & Immunology, Pediatrics, and Psychiatry), the Emory Rollins School of Public Health (Departments of Bioinformatics and Biostatistics, Environmental Health, and Global Health), the Yerkes National Primate Research Center, the Emory National Vaccine Center, and the U.S. Centers for Disease Control & Prevention (CDC).

The program is part of the Graduate Division of Biological and Biomedical Sciences and enjoys close working relationships with students and faculty in the Division's other programs (see final page).

Students

Our program has a relatively small and close-knit student community. Generally, 25 – 30 students are enrolled at any one time. Our website has information about all our current students, including research projects.

Our graduates go on to a wide variety of careers. Some recent examples include:

- Post-doctoral researchers: placements include the Max Planck Institute, Stanford University, University of Washington, the University of California at Los Angeles, and the Utrecht University in The Netherlands
- Assistant professors: placements include North Carolina State University and University of Alabama
- MD studies or residence
- Epidemic Intelligence Service, CDC
- Senior Project Manager, Analytical Biological Services, Inc.
- Division of Strategic Stockpile, CDC

Curriculum

Students usually complete the program in 5 years. A typical timeline looks like this:

Year 1: Required coursework, laboratory rotations

Year 2: Required coursework, elective coursework, select advisor, begin thesis research, qualifying exam

Year 3: Elective coursework, assemble dissertation committee, dissertation research

Year 4+: Dissertation research, written and oral defense

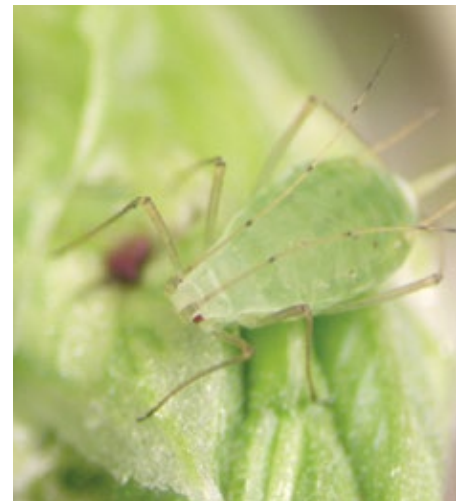
Our website has lists of specific required courses, electives in PBEE and other programs, and much more.

Student Profile

Benjamin Parker is a fifth-year graduate student in PBEE working with Nicole Gerardo. Ben is interested in the coevolution that occurs between pathogens and a host's immune system, and is currently studying the interaction between pea aphids, their symbiotic microbial partners, and an entomopathogenic fungus.

In his first and second years in the program, Ben was supported by PBEE's NIH training grant in the population biology of infectious disease. In Spring 2010, he was awarded a graduate student fellowship from the National Science Foundation. The fellowship supports outstanding graduate students in NSF-supported disciplines, and provides funding for three years.

Ben has had a lot of opportunity to travel to conferences and workshops in his first two years in PBEE. He attended the 8th International Symposium on Aphids in Catania, Italy where he gave a talk about the ongoing efforts of the Aphid Genome Project to characterize the aphid immune system. He also participated in the Ecology and Evolution of Infectious Diseases conference in Athens, GA, and Evolution 2010 in Portland, OR. Another good experience was attending a class on Environmental Genomics at the Mount Desert Island Biological Lab in the summer of 2010.



Student Research Seminars

Students are required to present their research as part of the PBEE Seminar Series. These presentations are based upon completed, ongoing or planned dissertation research. Each student seminar is 20 minutes in length (15 minutes for the presentation, 5 minutes for questions), similar to that typical of presentations at national meetings. A student typically presents their first seminar during the spring of their third year, and then annually thereafter. The presentations provide students an invaluable experience practicing the communications of scientific research and results, while providing an opportunity to receive feedback from program faculty, postdoctoral fellows, and students.

Training in Teaching

Scientists are often also teachers, whether in formal education or in the process of presenting to lay persons. At Emory, all doctoral students receive training in pedagogy and other elements of teaching, through the Teaching Assistant Training and Teaching Opportunity Program (TATTO) administered by the Graduate School.

After a brief summer workshop (usually before the second year), students are assigned by the Graduate Division of Biological and Biomedical Sciences to assist a faculty member as a lecturer, laboratory instructor or discussion leader for one semester. The Graduate Division offers additional TATTO courses, as well as additional teaching opportunities.

PBEE Faculty

- Rustom Antia, Ph.D.
Professor of Biology
- George Armelagos, Ph.D.
Goodrich C. White Professor of Anthropology
- Chris Beck, Ph.D.
Senior Lecturer of Biology
- Berry Brosi, Ph.D.
Assistant Professor of Environmental Studies
- Karen Conneely, Ph.D.
Assistant Professor of Human Genetics,
School of Medicine
- Greg Dasch, Ph.D.
Rickettsial Section Chief, Director,
CDC/WHO Collaborating Reference Center
for Rickettsia and Bartonella-Associated
Diseases, CDC
- Michael Epstein, Ph.D.
Associate Professor of Human Genetics, School
of Medicine
- Nicole Gerardo, Ph.D.
Assistant Professor of Biology
- Tom Gillespie, Ph.D.
Assistant Professor of Environmental Studies
- John Gimnig, Ph.D.
Research Biologist, CDC
- John Glasser, Ph.D.
Mathematical Epidemiologist, CDC
- Joanna Goldberg, PhD
Professor of Pediatrics
- Minsu Kim, PhD
Assistant Professor of Physics
- Uriel Kitron, Ph.D.
Professor/ Chair of Environmental Studies
- Keith Klugman, Ph.D.
Professor, William H. Foege Chair in Global
Health, Rollins School of Public Health
- Subra Kugathasan, M.D.
Professor of Pediatrics and Human Genetics,
Marcus Professor of Pediatric Gastroenterology,
Scientific Director, Children's Healthcare of
Atlanta Combined Center for Pediatric Inflam-
matory Bowel Disease
- Bruce Levin, Ph.D.
Samuel Candler Dobbs Professor of Biology
- Karen Levy, Ph.D.
Assistant Professor of Environmental Health,
Rollins School of Public Health
- John Lucchesi, Ph.D.
Asa Griggs Candler Professor of Biology
- David Lynn, Ph.D.
Candler Professor of Biology/Chair of Chemistry
- Ilya Nemenman, Ph.D.
Associate Professor of Physics and Biology
- Timothy Read, Ph.D.
Associate Professor with joint appointments in
the Division of Infections Disease, Department
of Medicine and the Department of Human
Genetics
- Leslie Real, Ph.D.
Asa Griggs Candler Professor of Biology
- Justin Remais, Ph.D.
Assistant Professor of Environmental Health,
Rollins School of Public Health
- Jaap de Roode, PhD
Assistant Professor of Biology
- Bill Shafer, Ph.D.
Professor of Microbiology & Immunology,
School of Medicine
- Stephanie Sherman, Ph.D.
Professor of Human Genetics, School of
Medicine
- David Stephens, M.D.
Stephen W. Schwarzmann Distinguished Profes-
sor of Medicine, Executive Associate Dean for
Research, School of Medicine
- Robert Tauxe, Ph.D.
Deputy Director, Division of Foodborne, Water-
borne and Environmental Diseases, CDC
- James Taylor, Ph.D.
Assistant Professor of Biology
- V. Udhayakumar, Ph.D.
Chief, Genetics and Immunology Laboratory,
Malaria Branch, Division of Parasitic Diseases,
CDC
- Gonzalo Vasquez-Prokopec, PhD
Assistant Professor of Environmental Studies
- Jorge Vidal, PhD
Assistant Professor of Global Health
- Irwin Waldman, Ph.D.
Professor of Psychology
- Lance Waller, Ph.D.,
Professor, Rollins School of Public Health
- Howie Weiss, Ph.D.
Professor of Mathematics, Georgia Institute
of Technology
- Thomas S. Wingo, M.D.
Assistant Professor Neurology
- Larry Young, Ph.D.
William P. Timmie Professor, Department of
Psychiatry. Director, Center for Translational
Social Neuroscience Division Chief, Behavioral
Neurosci. and Psychiatric Disorders
Yerkes National Primate Center
School of Medicine
- Michael Zwick, Ph.D.
Assistant Professor of Human Genetics,
School of Medicine

PBEE Areas of Inquiry: http://www.biomed.emory.edu/PROGRAM_SITES/PBEE/populationBiology.htm

Detailed Faculty Profiles: http://www.biomed.emory.edu/PROGRAM_SITES/PBEE/faculty.htm

About the GDBBS

Emory University is one of the major biological research and medical referral centers in the Southeast and is among the fastest growing Medical Centers in the United States. Emory is consistently ranked in the top 20 institutions nationally for NIH research support. Emory was recently named one of the 25 “New Ivies” by *Newsweek*, a testament to its quality and dedication to education. Emory was also ranked as having the sixth most beautiful campus in the nation by *The Best Colleges*.

The Graduate Division of Biological and Biomedical Sciences (GDBBS) has around 500 graduate students in nine interdisciplinary Ph.D. programs:

- Biochemistry, Cell and Developmental Biology
- Cancer Biology
- Genetics and Molecular Biology
- Immunology and Molecular Pathogenesis
- Microbiology and Molecular Genetics
- Molecular and Systems Pharmacology
- Neuroscience
- Nutrition and Health Sciences
- Population Biology, Ecology and Evolution

Over 350 world-renowned researchers mentor students admitted to these programs, giving them a unique opportunity to train with faculty at:

- American Cancer Society
- the U.S. Centers for Disease Control and Prevention
- Emory College
- the Robert W. Woodruff Health Sciences Center
- the Rollins School of Public Health
- The Carter Center
- the Winship Cancer Institute
- the Yerkes National Primate Research Center

Financial support includes a tuition scholarship, health insurance and a competitive stipend (\$28,000 for the 2013 – 2014 academic year). Funding is guaranteed as long as the student is making satisfactory progress toward their degree. The average time to degree is about 6 years. Training is interdisciplinary and students have the flexibility to perform their thesis work with GDBBS faculty outside their chosen program. Students typically perform three rotations before affiliating with a faculty member for their dissertation research.

The application deadline is December 1st for the following fall semester.

Laney Graduate School Degree Programs

Anthropology
 Art History
 Behavioral Sciences and Health Education
 Bioethics
 Biological and Biomedical Sciences
 Biochemistry, Cell and Developmental Biology
 Cancer Biology
 Genetics and Molecular Biology
 Immunology and Molecular Pathogenesis
 Microbiology and Molecular Genetics
 Molecular and Systems Pharmacology
 Neuroscience
 Nutrition and Health Sciences
 Population Biology, Ecology, and Evolution
 Biomedical Engineering
 Biostatistics
 Business
 Chemistry
 Clinical Psychology
 Cognition and Development (Psychology)
 Comparative Literature
 Computer Science and Informatics
 Development Practice
 Economics
 Educational Studies
 English
 Environmental Health Sciences
 Epidemiology
 Film Studies
 French
 History
 Graduate Institute of the Liberal Arts
 Health Services Research and Health Policy
 Islamic Civilizations Studies
 Mathematics
 MD/PhD
 Music
 Neuroscience and Animal Behavior (Psychology)
 Nursing
 Philosophy
 Physics
 Political Science
 Religion
 Sociology
 Spanish
 Women's, Gender, and Sexuality Studies



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Requests for Additional Information:

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