

KATHERINE BEIGEL

Curriculum Vitae

kbeigel@uttyler.edu | katherinebeigel@gmail.com | +1 (937) 726 0008
www.linkedin.com/in/kbeigel

EDUCATION

M.S. – Biology (thesis-based)

Jul. 2018 – Dec. 2020

University of Texas at Tyler, Tyler, TX (GPA: 4.0/4.0)

Thesis: “A cophylogenetic analysis of fungus-gardening ants and their symbiotic fungi”

Committee: Jon Seal Ph.D. (advisor), Katrin Kellner Ph.D., Joshua Banta Ph.D., Matthew Greenwold Ph.D.

B.S. – Evolution and Ecology (with Honors Research Distinction)

Aug. 2011 – May 2017

The Ohio State University, Columbus, OH (GPA: 3.79/4.0)

Honors Thesis: “Optimization of growth and imaging techniques for *Medicago truncatula* and investigation of root hair nuclear positioning during early rhizobial infection”

Honors Thesis Committee: Iris Meier Ph.D. (advisor), Anna Newman-Griffis Ph.D. (mentor), Gregory Booton Ph.D., Amy Youngs Ph.D.

B.A. – Art (with Honors in the Arts and Sciences)

Aug. 2011 – May 2017

The Ohio State University, Columbus, OH (GPA: 3.79/4.0)

RESEARCH EXPERIENCE

Research Associate

Jan. 2021 – Current

University of Texas at Tyler, Tyler, TX

Advisor: Jon Seal Ph.D.

- Overseeing laboratory operations, monitoring equipment, and conducting research
- Writing and editing manuscripts for publication in collaboration with co-authors
- Assisting other graduate students with their thesis projects and training new laboratory members in molecular techniques
- Performing data analysis using R, Python, command line, and Excel
- Supervising undergraduate students in laboratory procedures

Graduate Research Assistant

Jul. 2018 – Dec. 2020

University of Texas at Tyler, Tyler, TX

Advisor: Jon Seal Ph.D.

- Conducted graduate research project over fungus-gardening ants and their symbiotic fungal cultivars
- Collected samples in the field (TX, AZ) and maintained colony fragments in the laboratory
- Cultured fungal samples from fungus gardens onto media plates for subsequent genetic analyses
- Performed DNA extraction from tissue samples, amplification using polymerase chain reaction (PCR), gel electrophoresis, and other molecular techniques for preparing samples for Sanger sequencing and single nucleotide polymorphism (SNP) genotyping
- Analyzed DNA sequence data trace files, constructed multiple sequence alignments, estimated phylogenies, and ran statistical tests for congruence to investigate the coevolutionary relationship between fungus-gardening ants and their fungal cultivars
- Performed data analysis using R, Python, command line, and Excel
- Followed lab procedures to ensure a clean working environment and maintain integrity of molecular work

Post-Baccalaureate Intern**May 2017 – Dec. 2017**

Entomology Laboratory, Archbold Biological Station, Venus, FL

Advisor: Mark Deyrup Ph.D.

- Databased specimens in the field station's entomology collection to improve accessibility to specimen data for researchers
- Optimized specimen data retrieval interface using Microsoft Office Access and SQL
- Worked collaboratively with fellow database managers to implement standardized operating procedures (SOPs) and streamlined input for database entry with Microsoft Office Access
- Designed and conducted an independent research project on mutualistic relationships between plants, ants, and bacteria (rhizobia); analyzed features such as soil nutrients, plant biomass, ant visitation to host plant, ant nest proximity to host plant

Undergraduate Research Assistant**May 2014 – May 2017**

Meier Lab, The Ohio State University, Columbus, OH

Advisor: Anna Newman-Griffis Ph.D., Iris Meier Ph.D.

- Assisted Ph.D. candidate with research projects
- Practiced molecular genetics techniques such as RNA extraction, DNA extraction, transformation, PCR, cloning, gel electrophoresis, blotting, preparation of glycerol stocks, etc.
- Germinated and tended *Arabidopsis thaliana* and *Medicago truncatula* plants for research purposes in greenhouse, growth chamber, and growth room environments
- Prepared plates and liquid cultures with various types of media and antibiotics for microbial culture and colony isolation
- Inoculated seeding and adult *M. truncatula* plants with rhizobia bacteria and mycorrhizal fungi for research on mutualistic interactions
- Developed a protocol for z-stack imaging using confocal fluorescence microscopy of live root hair cells in *Medicago truncatula* seedlings; conducted an independent Honors research project on nuclear positioning in plant-bacteria symbiosis

Undergraduate Research Assistant**Aug. 2014 – May 2017**

C. A. Triplehorn Insect Collection, Museum of Biological Diversity, The Ohio State University, Columbus, OH

Supervisor: Luciana Musetti Ph.D.

- Produced standardized, publication-quality micro- and macrophotographs of insect specimens for collection databasing and entomology research
- Improved protocols and photography stage / light box for imaging specimens
- Trained and supervised colleagues with image capture systems and image editing techniques
- Developed visual media for museum website and events

Undergraduate Research Fellow**May 2015 – Aug. 2015**

NSF Research Experience for Undergraduates (REU), Blandy Experimental Farm, Boyce, VA

Advisor: Mary McKenna Ph.D.

- Conducted an independent research project hyperaccumulator plants (*Alyssum murale* and *Alyssum corsicum*) and a specialist herbivore insect (*Murgantia histrionica*)
- Designed experiments and measured leaf area damage (using image analysis software) as a proxy for herbivory to investigate whether the insect herbivore can detect accumulated heavy metals
- Monitored plant health in a greenhouse environment before and throughout experiments
- Maintained laboratory populations of study insect for herbivory experiments

Undergraduate Research Volunteer**Sep. 2011 – Apr. 2012**

Seeger Lab, The Ohio State University, Columbus, OH

Supervisor: Mark Seeger Ph.D.

- Learned and practiced basic molecular biology protocols and procedures
- Sorted *Drosophila melanogaster* adults based on sex and phenotype for laboratory research purposes
- Maintained laboratory populations of *Drosophila melanogaster* and performed crossbreeding

PRESENTATIONS AND POSTERS

Beigel K, J Seal. “Genome-wide single-nucleotide polymorphisms (SNPs) suggest patterns of codivergence between *Trachymyrmex* fungus-growing ants (Tribe Attini) and their fungal cultivars.” **Entomological Society of America. 2020.** Online. (*Oral Presentation, 10 min.*)

Beigel K, K Kellner, J Seal. “Cophylogenetic patterns in fungus-growing ants and their fungal cultivars: Evidence for cryptic speciation?” **Entomological Society of America. 2019.** St. Louis, MO. (*Infographic Poster*)

Beigel K. “Two’s company, three’s a crowd: Investigating interactions between ants, plants, and rhizobia.” **Archbold Biological Station Intern Seminar. 2017.** (*Oral Presentation, 30 min.*)

Beigel K, A Newman-Griffis, I Meier. “Imaging techniques for temporal mapping of early infection thread formation in the legume *Medicago truncatula*.” **American Society of Plant Biologists Midwest Section. 2017.** Purdue University, West Lafayette, IN. (*Oral Presentation, 15 min.*)

Beigel K, J Cuff, M McKenna. Chemical and elemental defenses in the Brassicaceae and their effects on the specialist sequestering insect *Murgantia histrionica*.” Research Poster. **Denman Undergraduate Research Forum. 2016.** The Ohio State University, Columbus, OH. (*Poster*)

Beigel K, J Cuff, M McKenna. “Elemental defense in Ni-hyperaccumulators against a specialist herbivore *Murgantia histrionica*.” **Ecological Society of America 101st Annual Meeting. 2015.** Fort Lauderdale, FL. (*Poster*)

Beigel K, M McKenna. “Chemical and elemental defenses of Ni-hyperaccumulators (Brassicaceae) and their effects on the specialist herbivore *Murgantia histrionica*.” **Blandy Experimental Farm NSF REU Research Forum. 2015.** (*Oral Presentation, 15 min.*)

TEACHING EXPERIENCE

Graduate Teaching Assistant

Department of Biology, University of Texas at Tyler, Tyler, TX

Courses:

2018 – General Biology I Laboratory (BIOL 1106, Fall, 2 sections)

2019 – General Biology II Laboratory (BIOL 1107, Spring, 2 sections)

2019 – Genetics Laboratory (BIOL 3133, Fall, 2 sections)

2020 – Cell Biology Laboratory (BIOL 3134, Spring, 2 sections)

2020 – General Biology II Laboratory (BIOL 1107, Fall, 2 sections)

Graduate Student Mentor

Seal Lab, Department of Biology, University of Texas at Tyler, Tyler, TX

Undergraduate Mentee: Christine V. Pawlik

AWARDS AND RECOGNITIONS

Southwestern Research Station Graduate Student Award - Inaugural Year Research Proposal

Southwestern Research Station, Portal, AZ

Details: Reduction in station fees (50%, est. ~ \$1000) awarded to participants with high-quality proposals who did not place first

Proposal: "Host-switching in the Chiricahuas—evidence for cryptic speciation?"

Medalist Scholarship

The Ohio State University, Columbus, OH

Details: Merit-based full-tuition award for four years (est. ~\$112,000) at The Ohio State University

TechHub Student Project Development Grant

The Ohio State University, Columbus, OH

Details: Award (\$3000) for research and development costs of proposed project; intended to promote technological literacy and skills such as 3D modeling and printing, fabrication, electronics, etc.

Proposal: "Hyperaccumulator Robot"

Franz Theodore Stone Laboratory Scholarship Award

F. T. Stone Laboratory, Gibraltar Island, Lake Erie, OH

Details: Merit-based award toward fees for Stone Laboratory field courses

Dean's List, College of Arts and Sciences

The Ohio State University, Columbus, OH

Spring 2012, Autumn 2012, Spring 2013, Autumn 2013, Spring 2014, Autumn 2014, Autumn 2015

ADDITIONAL EDUCATION / EXPERIENCE

Freelance Illustration and Design

2009 – Current

Independent contracting and volunteerism

- Create digital and print media based on a variety of subject matter
- Specialization in visual science communication

Horticulture Technician

Feb. 2018 – Aug. 2018

Millcreek Gardens LLC, Ostrander, OH

- Propagated (seeds and plugs) and maintained plants for wholesale distribution in greenhouse and outdoor environments
- Monitored watering regimens, routinely applied fertilizer, and pruned plants

Undergraduate Student — Tropical Field Ecology Study Abroad Program

May 2016

The Smithsonian Tropical Research Institute, Gamboa, Panama

Instructor: Steve Hovick Ph.D.

- Performed field sampling and specimen collection in tropical ecosystems
- Conducted a small-scale research project and accompanying research paper on macroinvertebrate diversity

Undergraduate Student — Field Ecology Program

Summer 2014

F. T. Stone Laboratory, Gibraltar Island, Lake Erie, OH

Instructor: Doug Kane Ph.D.

- Gained hands-on experience with field sampling and specimen collection in freshwater and terrestrial ecosystems
- Practiced species identification of a variety of organisms in the field and in the laboratory

SCIENCE COMMUNICATION AND OUTREACH EVENTS

Event Supervisor — Darwin Day

2018 – 2019

University of Texas at Tyler and Discovery Science Place, Tyler, TX

- Coordinated and supervised educational activities and displays to communicate with the public about the importance of science literacy

Activity Supervisor — Ecology Summer Camp

2017

Archbold Biological Station, Venus, FL

- Designed and supervised an educational game to teach children about pollination

Event Supervisor — Annual Open House

2015 – 2018

Museum of Biological Diversity, The Ohio State University, Columbus, OH

- Designed and supervised creative and educational activities for the C. A. Triplehorn Collection
- Photographed visitors and exhibits and created materials for event advertisement

Activity Coordinator — Engaging with Insects Day Camp

2016

Museum of Biological Diversity

The Ohio State University, Columbus, OH

- Designed and produced educational craft activities
- Photographed camp events

SKILLS

Laboratory: Molecular biology (RNA/DNA purification, PCR, transformations, gel electrophoresis, SDS-PAGE, blotting, etc.); microscopy (confocal, compound, dissection); microbiology (culturing bacteria, fungi); maintenance of laboratory supplies (autoclaving, preparation/storage/disposal of reagents and basic laboratory materials)

Technical / Software: R, Python, Linux command line, various bioinformatics programs, Excel, FIJI

Scientific Communication: Illustration, graphics, and 3D modeling (for publication, protocols, and outreach); planning and coordinating outreach events; instructing biology laboratory courses; training others on protocols/SOPs/equipment in the laboratory

General: Protocol/equipment/methodology troubleshooting; fastidious record-keeping; maintenance of clean laboratory environments

Miscellaneous: modeling/CAD for 3D printing

REFERENCES

Jon Seal Ph.D.

Relationship: Masters Advisor, Current Supervisor

Position: Associate Professor; Department of Biology, University of Texas at Tyler, Tyler, TX

Email Address: jseal@uttyler.edu

Phone Number: +1 (903) 565-5757

Katrin Kellner Dr. rer. nat.

Relationship: Master's Thesis Committee Member

Position: Research Assistant Professor; Department of Biology, University of Texas at Tyler, Tyler, TX

Email Address: kkellner@uttyler.edu

Phone Number: +1 (903) 566-7280

Anna Newman-Griffis Ph.D.

Relationship: Graduate Student Mentor (during her Ph.D. at The Ohio State University)

Position: Lecturer; Department of Biological Sciences, University of Pittsburgh, Pittsburgh, PA

Email Address: ann90@pitt.edu

Phone Number: +1 (703) 725-6962