

# Biology@Memphis

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## Department of Biological Sciences

*creating leaders in research, education and service*

College of Arts & Sciences



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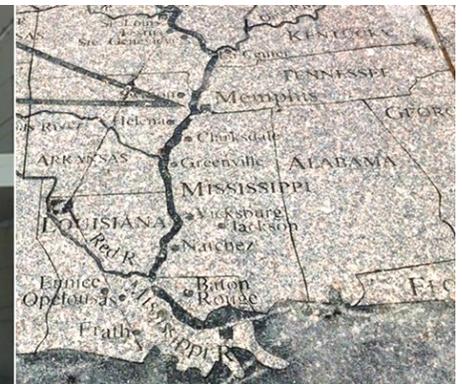


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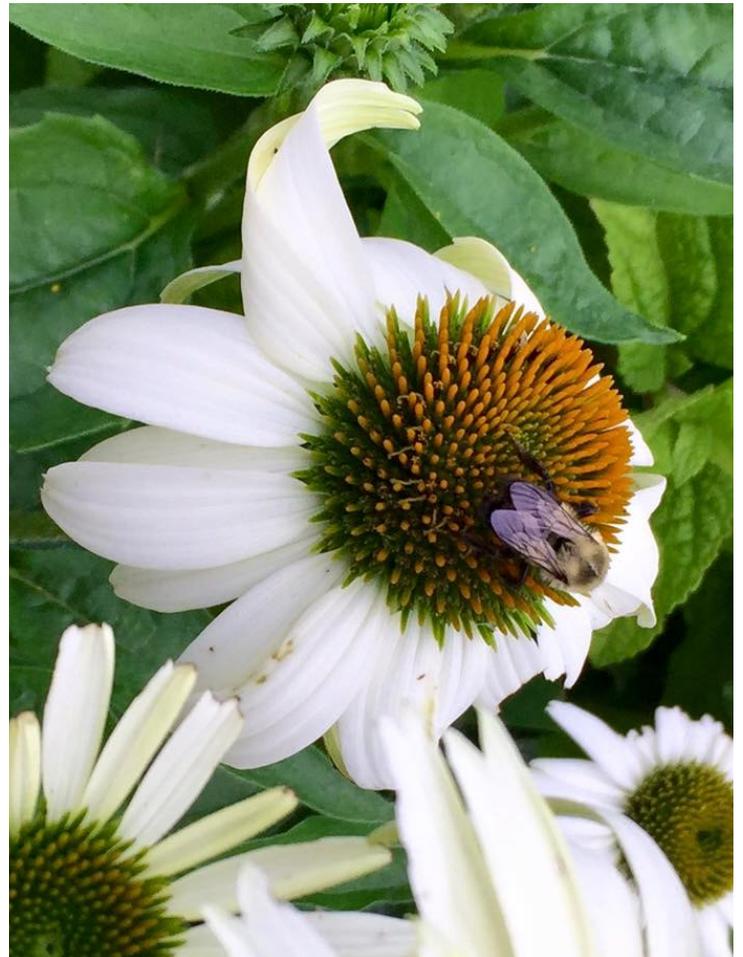
## Remembering Bill Simco (1938-2016)



### A mentor, a colleague, a friend.

#### From the Communications Committee

As the Academic Year draws to a close, it seems that time got away from us this fall and before we knew it, it was March. We missed our deadline for the Fall newsletter, so we decided to wait and share all of our news in this double issue of *Biology@Memphis*. It's been a banner year for our faculty and students. Several new grants from the NIH and the Gates Foundation, NSF recognition of our graduate students, undergraduates and graduate students presenting at University, State, and National meetings, and a number of publications including a high impact article from a member of our faculty that received national attention. Three of our faculty are retiring and moving on to new challenges, and we welcomed a new faculty member to the fold. In the fall, two additional new faculty members will be joining us. We had a number of graduate students moving on to new challenges and the Department participated in the Memphis BioBlitz, a National Geographic sponsored program. Remember, you can let us know what you're doing by emailing your news to us at [bionews@memphis.edu](mailto:bionews@memphis.edu) and can keep up with the Department by following us on [Facebook](#) and the [Department web site](#)

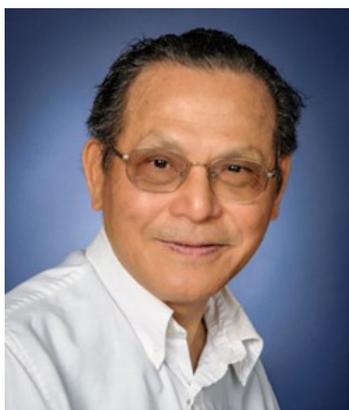


## FACULTY NEWS: Retirements, New Faculty, Grants, Awards, and Presentations

### Retirements

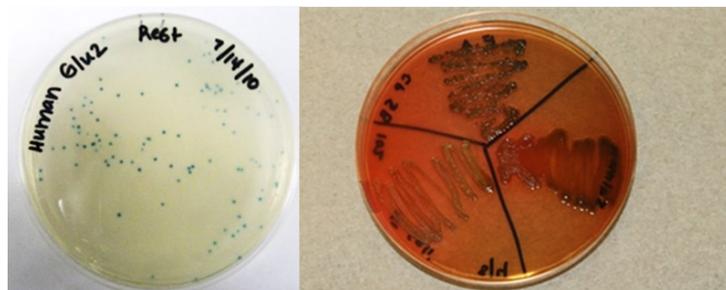
This semester, three faculty members have decided to move on to the next phases of their lives.

**Dr. King Thom Chung** received his B.S. degree from National Taiwan University (Taipei) with a major in Agricultural Chemistry. He received his M. A. in Biology and his Ph. D. in Microbiology from University of California-Santa Cruz.



Dr. Chung came to the University of Memphis in 1988, where he studied anaerobic bacteria, with a special interest in the microbial functions in the gastrointestinal tracts of human and animals, particularly their roles in cancer formation. Dr. Chung has published numerous articles on the impact of bacteria on human health, most recently Carcinogenicity, allergenicity, and lupus-inducibility of arylamines. *Front Biosci* 8: 29-39, 2016

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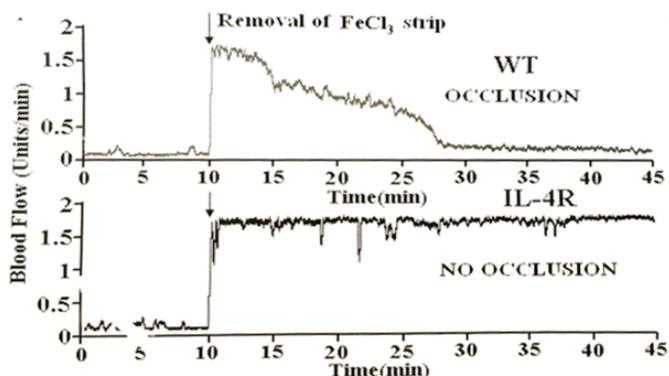


**Dr. T. Kent Gartner** received his Ph.D. in microbiology and bacterial genetics at the University of California-Davis. His first academic position was at the University of California-Santa Barbara where he worked on suppressor mutations that altered ribosome structure and function. Dr. Gartner arrived at the University of Memphis 1976, where his research shifted to platelet function and signal transduction. Dr. Gartner was awarded the first NIH grant received by the College of Arts and Sciences at the UofM. Dr. Gartner has published nearly 100 research articles during his time at the UofM.



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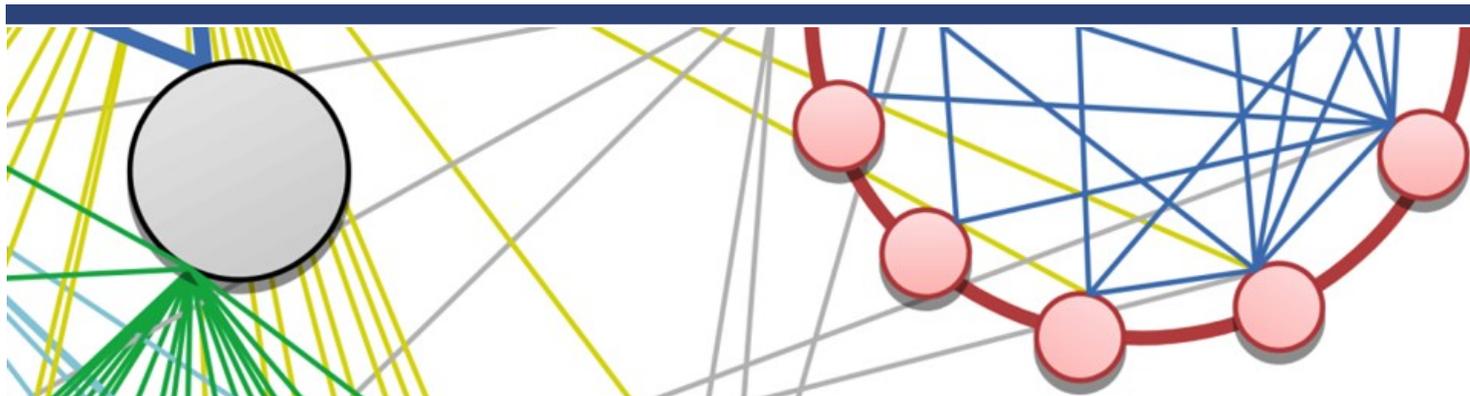
**Dr. S. Reza Pezeshki** received his B.S. in Forest Engineering from the Univ. of Tehran. He came to the United States for his graduate work, earning an M.S. and Ph.D. in Forest Resources from the University of Washington-Seattle.



Dr. Pezeshki served as Assistant professor (1987-90) and Associate Professor (1990-94) at Louisiana State University- Baton Rouge then joined the Department in 1994. Dr. Pezeshki's research interests include plant ecology and ecophysiology, soil-plant interactions, and effects of natural and anthropogenic factors

on survival, productivity, and distribution of wetland plants. Dr. Pezeshki has published over 150 articles during his academic career.



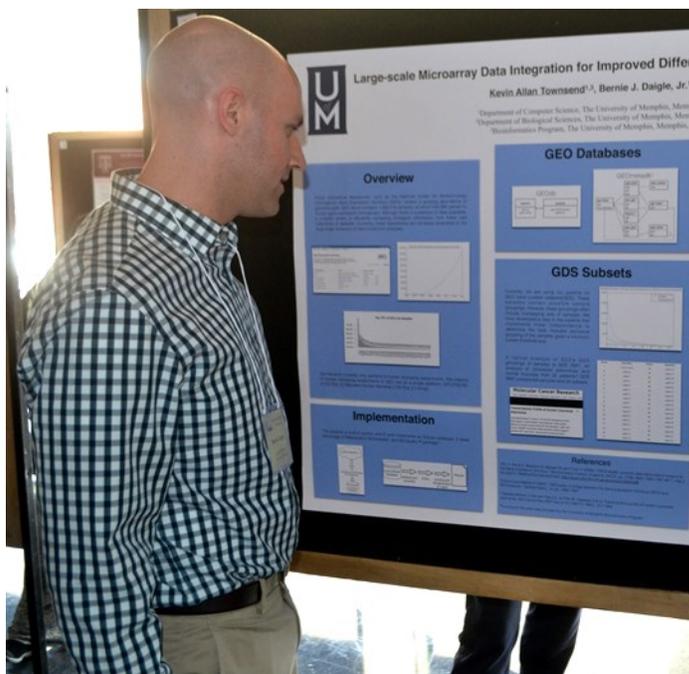


## The Department Welcomes Dr. Bernie Daigle



Dr. Daigle joined the Department of Biological Sciences in 2015. In addition to his primary appointment in the Department of Biological Sciences, Dr. Daigle has a secondary appointment in the Department of Computer Science and is a faculty affiliate with the Bioinformatics Program. Dr. Daigle started out his scientific training at Cornell University, where he was a biology major with a concentration in genetics and development. His initial research experience was in yeast genetics and biochemistry, but he wanted to do graduate work in human genetics and entered the graduate program at Stanford University. At that point in time, bioinformatics and computer models of biological systems hadn't entered into his thinking. However, a laboratory rotation with Dr. Russ Altman changed his perspective. Dr. Altman uses computational techniques to understand the genetic basis for variability in drug responses, the structure of proteins, and the relationship between an organism's genes and its phenotype (functional genomics). During this rotation, something just "clicked" for Dr. Daigle and led him to develop his own curriculum at Stanford, which included computer programming, statistics, and engineering, to go along with training in molecular biology, genetics, genomics, and bioinformatics.

Dr. Daigle brings a unique combination of skills to the Department and the Bioinformatics program; he understands the experimental tools and the biology of diseases like breast cancer and can also "talk" computer programming, mathematics, and statistical analyses. He indicates that the goal of the work in his lab "is to improve the inference of biological meaning from the wealth of experimental data collected from single cells to whole organisms." The reason for this is quite clear; biologists in all disciplines are generating large amounts of data in short periods of time, fueled by technologies that allow genomes to be sequenced in days instead of months to years. However, our ability to gain biological insights from that data has not kept pace, surprisingly enough, due to computational limitations. In his post-doctoral work, conducted at the University of California, Santa Barbara, Dr. Daigle continued his bioinformatics research while also beginning projects focused on modeling and analysis of stochastic biochemical systems. A stochastic effect occurs by chance (i.e. it is unpredictable) and, in many cases, reflects genetic changes. For



Dr. Daigle at the 13th Annual MidSouth Computational Biology and Bioinformatics Society Picture courtesy of R Homayouni

example, exposure to ionizing radiation can lead to changes in genes and the occurrence of cancers. The probability of cancer occurring is proportional to the radiation dose, while the severity is dose-independent. At the University of Memphis, Dr. Daigle is continuing his bioinformatics and modeling work by developing statistical and computational tools. One project is utilizing transcriptomic data from 1.6 million samples in the public domain to increase the accuracy of identifying differentially expressed genes without performing excessive experimental replicates. The tool he has developed called SVD Augmented Gene expression Analysis Tool (SAGAT) can “make 4 samples look like 6”. In addition, he is applying computational methods to characterize promoter architecture (i.e. the locations and strengths of transcription factor and RNA polymerase binding sites governing the expression of a particular gene) to predict patterns of gene expression in single cells.

Lest you think that all Dr. Daigle does is work in the lab, he confessed that he and his wife Patty are big college football fans. Seems he came to the UofM at the right time to enjoy the emergence of the University of Memphis football program. In fact, we have photographic evidence of Bernie and Patty at the Birmingham Bowl.

Visit [Dr. Daigle's website](#) and read some of his first author papers by clicking on the links below.



- Daigle Jr., B.J., Soltani, M., Petzold, L.R., and Singh, A. (2015). [Inferring single-cell gene expression mechanisms using stochastic simulation](#). *Bioinformatics* 31, 1428–1435.
- Daigle Jr., B.J., Roh, M.K., Petzold, L.R., and Niemi, J. (2012). [Accelerated maximum likelihood parameter estimation for stochastic biochemical systems](#). *BMC Bioinformatics* 13, 68.
- Daigle Jr., B.J.\*, Roh, M.K.\*, Gillespie, D.T., and Petzold, L.R. (2011). [Automated estimation of rare event probabilities in biochemical systems](#). *The Journal of Chemical Physics* 134, 044110.
- Daigle Jr., B.J., Deng, A., McLaughlin, T., Cushman, S.W., Cam, M.C., Reaven, G., Tsao, P.S., and Altman, R.B. (2010). [Using Pre-existing Microarray Datasets to Increase Experimental Power: Application to Insulin Resistance](#). *PLoS Comput Biol* 6, e1000718



## Grants

**Dr. Amy Abell** received an R01 from the National Institutes of Health entitled *Coordinate regulation by MAP3K of epigenetic modifies controlling EMT*. **Dr. Ramin Homayouni** is a co-PI on this grant.

**Dr. Ramin Homayouni** received a new award from the Bill & Melinda Gates Foundation to continue his project entitled *System Dynamic Modeling of Child Growth and Development*. Dr. Homayouni also received a Faculty Research Grant from the University of Memphis for his proposal entitled *Role of Nipsnap1 in mitochondrial dehydrogenases*.

**Dr. Jennifer Mandel** is a co-Principle Investigator on two grants from the Smithsonian Biogenomics - Global Genome Initiative including "*Building a reference genome for Centrapalus pauciflorus an African oilseed crop and Reconstructing Character Evolution in Compositae (Asteraceae) using Next-Generation Target Enrichments of Data (Flowering Plants)*". Dr. Mandel also received a Faculty Research Grant from the University of Memphis for her proposal *Comparative transcriptomics in higher order floral structures of the daisy family*.



Pictured (left to right): Drs. Duane McKenna, Michael Ferkin, David Freeman, Amy Abell, and Jennifer Mandel.

## Faculty Teaching and Research Awards

**Dr. Duane McKenna** received the **2015 Dean's Award for Teaching Excellence**. **Dr. McKenna** is an insect systematist and evolutionary biologist whose research employs large-scale molecular data sets, and information from museum specimens and field studies, to reconstruct relationships and timing and patterns of ecological and taxonomic diversification, with a focus on the evolution of beetle-plant interactions and phytophagy (plant-feeding).

**Dr. Michael Ferkin** received the **Jack H. Morris Professorship** based on "his outstanding contributions to the university over the years. The award is a way to recognize a faculty member who has made significant contributions to the University in research, teaching, and service."

**Dr. David Freeman** is the 2016 recipient of the **Alumni Association Distinguished Teaching Award**. Every Spring, the University of Memphis Alumni Association honors four outstanding faculty with the presentation of the Distinguished Teaching Award. The faculty are nominated by UofM full-time faculty, students, and alumni and the Distinguished Teaching Award Committee, which includes former award winners, selects a number of nominees for further consideration. The Distinguished Teaching Award Committee reviews all pertinent data, including the student evaluations of all courses taught within the past three years, to select the award winners.

**Dr. Amy Abell** was awarded the **Excellence in Teaching Award** from the Sigma Alpha Pi National Society of Leadership and Success at the University of Memphis. This award is given to a professor who "has exemplified the purpose of the Society through excellence in academic student development."

**Jennifer Mandel** has received one of the College of Arts and Sciences' **Early Career Research Awards**. Each academic year the College gives up to three awards to faculty members who are in the early stages of developing research programs

## National Press for the Beetle Tree of Life Project

**The Beetle Tree of Life** project, spearheaded by **Dr. Duane McKenna** and representing 10 years of work, culminated in a ground-breaking paper revealing the evolutionary history of earth's most diverse group of animals.



Image courtesy of Alex Wild ©

Published by John Wiley & Sons Ltd on behalf of Royal Entomological Society, the news release for this research article indicated that "Combining the most robust and inclusive beetle family tree ever assembled with a fossil-calibrated timescale revealed both pattern and age for the tree and its many branches." Dr. McKenna indicated that "Our reconstruction reveals new insights into 300 million years of beetle evolution. Low extinction rates, protected wings, and ancient interactions with plants, fungi and microorganisms appear to be the main keys to their success." Visit the [Wiley Online Library](#) to read Dr. McKenna's paper *The beetle tree of life reveals that Coleoptera survived end-Permian mass extinction to diversify during the Cretaceous terrestrial revolution*. *Syst Entomol* 40: 835–880, 2015. You can also visit [Dr. McKenna's website](#) to read more about his work on the phylogeny and evolution of beetles and other insects, the evolution and genomic basis of phytophagy, and interactions between beetles and plants on ecological and evolutionary time scales.

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## Invited Talks

**Dr. Bernie Daigle** presented *Increasing Experimental Power by Integrating microRNA-mRNA Interaction Networks with Microarray Data* at the Fourth Annual Winter Q-Bio Meeting in Honolulu, HI February 2016. Dr. Daigle also presented *Increasing Experimental Power by Integrating Heterogeneous Biological Datasets* at the University of Memphis Computer Science Colloquium in February of 2016

## Presentations

**Schoech SJ**, Bebus SE, Elderbrock EK, Jones BC, Small TW. Behavioral type and corticosterone responsiveness are linked in Florida Scrub-Jays: Exploring causes and consequences of physio-behavioral phenotypes. Behaviour 2015, Cairns, Queensland, Australia, August 2015.

**Daigle, BJ** *Integration of microRNA-mRNA Interaction Networks with Microarray Data to Increase Experimental Power* 13th Annual MidSouth Computational Biology and Bioinformatics Society (MCBIOS) Conference, Memphis, TN March 2016.



## GRADUATE STUDENT NEWS: Scholarships and Awards

### Defenses and Degrees

**Alex Aitken** successfully defended his Master's thesis on June 23, 2015. The work leading to Mr. Aitken's thesis entitled *Phylogenomic data help resolve the phylogeny of weevils (superfamily Curculionoidea)* was performed under the direction of [Dr. Duane McKenna](#).

On August 25, 2015, **Fahrma Salami** successfully defended her dissertation entitled *Molecular role of D DAB2IP GTPase activating protein in brain development*. Dr. Salami performed her dissertation work in the laboratory of [Dr. Ramin Homayouni](#).

**Christopher Grow** successfully defended his Master's thesis entitled *An Assessment of Haplotype and Nucleotide Diversity in the Southern Short-tailed Shrew (Blarina carolinensis)* on November 11, 2015. Mr. Grow did his Master's research under the direction of [Dr. Michael Kennedy](#).



**Kallye Baggett** completed her Master's work by successfully defending her thesis entitled *The role of a novel mitochondrial protein, Nipsnap1, in neurodegeneration* on February 23, 2016. Ms. Baggett's thesis work was done under the direction of [Dr. Ramin Homayouni](#).

On March 15, 2016 **Nikki Brantley** successfully defended her Master's thesis entitled *In Vivo Imaging of Gonad Dynamics in Transparent Casper Zebrafish*. Ms. Brantley did her Master's research in the laboratory of [Dr. Charles Lessman](#).

**Danielle Howell** successfully defended her Master's thesis entitled *Partitioning Defective Protein 6: A mechanistic regulator of neuronal migration* on March 30, 2016. Ms. Howell's thesis work was done under the joint direction of [Dr. Omar Skalli](#) and [Dr. David Solecki](#) (St. Jude Children's Research Hospital)

## Defenses and Degrees, continued

On March 31, 2016, **Sara E. Bebus** successfully defended her doctoral dissertation entitled *Individual differences in neophobia: relationships with stress-physiology, experience, and learning*. Dr. Bebus did her doctoral research in the laboratory of **Dr. Stephan Schoech**.

**Blake C. Jones** successfully defended his doctoral dissertation entitled *The effect of predatory encounters on HPA axis responsiveness and memory of avian prey* on April 1, 2016. Dr. Jones' dissertation research was performed under the direction of **Dr. Stephan Schoech** and **Dr. David Freeman**.

**Lauren A. Madeira** completed her Master's work by successfully defending her thesis entitled *Interspecific association between two distantly related species, white-tailed deer and Eastern wild turkey* on April 4, 2016. Ms. Madeira did her Master's research under the direction of **Dr. Michael Kennedy**

**Alyssa Goggins** completed all the coursework required for her Master's degree and passed her comprehensive exams in January, 2016. **Dr. Carlos Estrano** supervised her Master's program.

**Channing McLauren** completed all the coursework required for his Master's degree and passed his comprehensive exams in April, 2016. **Dr. Judy Cole** supervised his Master's program.



Pictured (Left to Right): Blake Jones (S Bebus), Malle Carrasco-Harris (S Reichling), Adam Ramsey (J Mandel), and Stephen Ferguson (S Schoech)

## Grants and Fellowships

**Blake Jones** (coPI) and **Stephan Schoech** (PI) received a Doctoral Dissertation Improvement Grant from the National Science Foundation for the proposal entitled *Dissertation Research: Assessing the effects of stress physiology on long-lasting memory in a free-living animal*.

**Malle Carrasco-Harris** received a Graduate Research Fellowship award from National Science Foundation for her project entitled *The Effects of Habitat Urbanization and Isolation on a Top Predator*. Malle is performing her Ph.D. research under the joint direction of **Dr. Steve Reichling** (Memphis Zoo) and **Dr. Judy Cole** (Biological Sciences).

**Adam Ramsey** received an honorable mention award for his GRFP proposal *Paternal leakage, heteroplasmy and fitness in carrot: implications for organellar genome evolution and gynodioecy*. This entitles Adam to enhanced access to XSEDE cyberinfrastructure resources, including supercomputing time, in support of research toward completion of the graduate program of study. Adam also received a Nantucket Biodiversity Initiative Research Grant. Adam is a Ph.D. student with **Dr. Jennifer Mandel**.

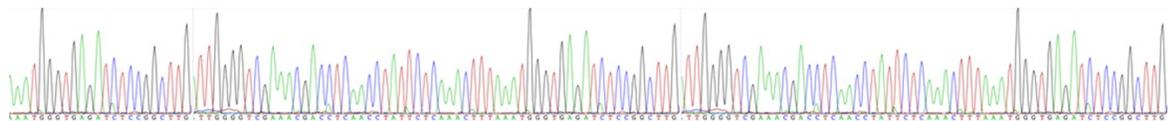
**Stephen Ferguson** received a Georgia Ornithological Society Terrell Grant for his proposal *The presence and function of geographic variation in a female-specific call*, an Animal Behavior Society Grant for his project *Nestling behavioral and physiological responses to parental territory defense*, and Eastern Bird Banding Association grant for his proposal *Physiological profiles as a regulator of dispersal distance in Florida scrub-jays*.

## Awards

**Adam Ramsey** received a number of awards in support of his research including a University of Memphis CAS Travel Enrichment Fund Award, a New England Botanical Club Graduate Student Research Award, a University of Massachusetts Field Station in-kind Housing Award, Southern Appalachian Botanical Society Travel Award, and an Association of Southeastern Biologists Travel Award. In addition, Adam received 1<sup>st</sup> place in the Ecology and Environmental Technology division for his oral presentation *A survey of Queen Anne's lace on Nantucket and an assessment of its effects on native pollination* at the 125<sup>th</sup> Annual Meeting of Tennessee Academy of Sciences. Adam is a Ph.D. student in the laboratory of [Dr. Jennifer Mandel](#).



**Stephanie Haddad** Won 2nd place in the Graduate Ten-Minute Paper Competition, Systematics and Taxonomy section for her presentation *Progress in reconstructing the higher-level phylogeny of longhorned beetles (Coleoptera: Cerambycidae) using phylogenomic data* at the 2015 Annual Meeting of the Entomological Society of America. Stephanie is a Ph.D. candidate in the laboratory of [Dr. Duane McKenna](#).



## Presentations

**Koontz MB, Saunders LE, Pezeshki SR.** Seasonal changes in nutrient allocation and growth of a wetland plant grown in constructed drainage ditches. *Annual Meeting of the Society of Wetland Scientists*. Providence, RI, June, 2015.

**Saunders LE, Koontz MB, Pezeshki SR.** Leaf chlorophyll content reduction and recovery in *Panicum hemitomon* (maiden cane) in response to repeated applications of root zone glyphosate. *Annual Meeting of the Society of Wetland Scientists*. Providence, RI, June, 2015.

**Jones BC, Bebus SE, Ferguson SM, Bateman PW, Schoech SJ.** Corticosterone exposure and the retention of long-lasting memory in free-living Florida scrub-jays (*Aphelocoma coerulescens*). Symposium on *Endocrine Control of Behaviour: the Avian Perspective*. Convenors Kate Buchanan and Kristal Cain, Behaviour2015, Cairns, Queensland, Australia, August 2015.

**Ferguson SM, Jones BC, Schoech SJ.** Low corticosterone-response Florida scrub-jays (*Aphelocoma coerulescens*) react more aggressively to territorial call playback. Symposium on *Animal Personality, Aggression, and Physiological Responsiveness*. Convener Lynne Sneddon, Behaviour2015, Cairns, Queensland, Australia, August 2015

**Bebus SE, Small TW, Jones BC, Elderbrock EK, SJ Schoech.** Learning and flexibility are predicted by neophobia and developmental stress hormone level in an avian species. Behaviour2015, Cairns, Queensland, Australia, August 2015.

**Ramsey AJ and Mandel JR.** A survey of Queen Anne's Lace on Nantucket and an assessment of its effect on native pollination. Nantucket Biodiversity Initiative Biennial Biodiversity Research Conference, Nantucket, MA. November 2015

**Ramsey AJ and Mandel JR.** November 2015. A survey of Queen Anne's Lace on Nantucket and an assessment of its effect on native pollination. Tennessee Academy of Science 125th meeting, Murfreesboro, TN. Tennessee Academy of Science 125th meeting, November 19-20.

**Haddad S, Shin S, Lemmon A, McKenna DD** Progress in reconstructing the higher-level phylogeny of longhorned beetles (Coleoptera: Cerambycidae) using phylogenomic data. Annual Meeting of the Entomological Society of America of Minneapolis, MN, November 16.

## Presentations, continued

**Ramsey AJ and JR Mandel.** Patterns of cyto-nuclear disequilibrium and the influence of heteroplasmy in wild carrot, *Daucus carota* (Apiaceae). Association of Southern Biologists, Concord NC, April 2016



Pictured (clockwise from top left): Noha Ahmed Mohammed Ahmed Shendy, Robert Mobley, Malle Carrasco-Harris, Adam Ramsey, Paul Hollis, Gayatri Mamidanna, Deepthi Raghu, and Ram Thapa.

## University of Memphis Research Forum Poster Presentations

The University of Memphis Student Research Forum, open only to students enrolled at the University of Memphis, is an annual event which showcases the diverse research of undergraduate and graduate students. The purpose is to provide a venue for students to present their research to a panel of faculty judges in their respective disciplines. The Department of Biological Sciences was well-represented this year, with posters presented by:

**Carrasco-Harris M, JA Cole, S Reichling.** The Spatial Ecology of Urban Copperheads.

**Hollis P** TR Sutter Knockdown of CYP1B1 Abrogates Invasion of MDA-MB-231 Breast Cancer Cells

**Mamidanna G JA Cole** Comparison of parathyroid hormone (PTH) agonist effects on cell signaling and proliferation in Saos-2 cells.

**Mobley R AAbell** MAP3K4 kinase activity coordinates chromatin remodelers responsible for transitions between epithelial and mesenchymal phenotypes

**Raghu D AAbell** Loss of Galnt3 induces protein mislocalization in murine trophoblast stem cells

**Ramsey A and JR Mandel.** Patterns of cyto-nuclear disequilibrium and the influence of heteroplasmy in wild carrot, *Daucus carota* (Apiaceae).

**Shendy NA AAbell** c-Rel is a novel master regulator of EMT

**Thapa R JR Mandel** Reconstruction of Phylogenetic Relationship in *Antennaria* (Asteraceae) using Data from Hundreds of Loci

## UNDERGRADUATE NEWS: Research and Awards

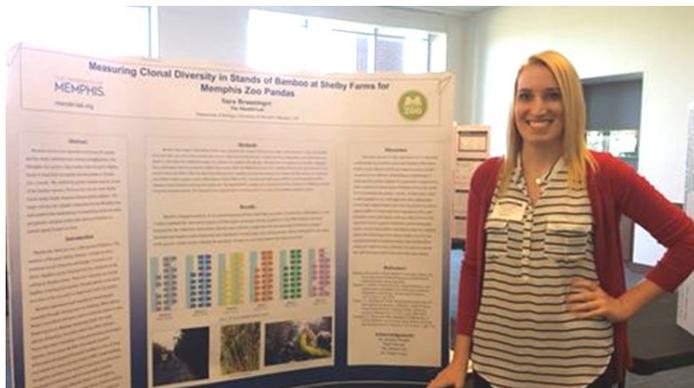
### Research and Awards

Congratulations to **Kendall Major** for winning a 2016 **Botanical Society of America Undergraduate Research Award** for her work *Genetic Diversity and Population Structure in the Clonal Plant Trillium recurvatum* performed in the laboratory of **Dr. Jennifer Mandel**. Kendall was also invited to give an oral presentation on her work at this year's 30<sup>th</sup> Annual National Conference on Undergraduate Research (NCUR) meeting at the University of North Carolina-Asheville, April 7-9, 2016. Kendall also received this year's **Biology Faculty Award** from the Department, which is given annually to the student who has done the most for the Department.



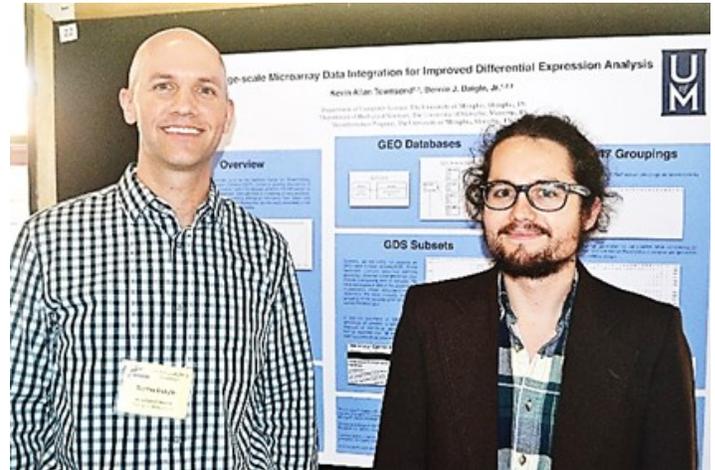
Pictured: Kendall Major with Trillium (left) and speaking at the NCUR meeting at UNC-Asheville. Pictures courtesy of J Mandel and the Helen Hardin Honors Program.

Congratulations to Sara Brauning, a 2015 Biology graduate who received a **QuaesitUM Outstanding Paper Award** for her article *Measuring Clonal Diversity in Stands of Bamboo*. *QuaesitUM* is a peer-reviewed annual publication that provides an academic forum where University of Memphis under-



Pictured: Sara Brauning (courtesy of J Mandel)

graduate students can showcase research from all disciplines. Sara's work on bamboo was sponsored by the Memphis Zoo and performed under the direction of **Dr. Jennifer Mandel**.



Although **Kevin Townsend** is an Undergrad Math major, his mentor is **Dr. Bernie Daigle**, so we're claiming at least part of the kudos for his 2nd place finish in the Undergraduate Math and Computer Science Division at the Student Research Forum for his poster *Large-scale Microarray Data Integration for Improved Differential Expression Analysis*

**Blair Combest** presented his practicum work entitled *Mycorrhizae Rising: A Greenhouse Study on the effects of Varied Concentrations of Endomycorrhizal Inoculant on Phaseolous vulgaris—the Green Bean, Early Contender Variety* on April 29th. **Drs. Jennifer Mandel** and **Barbara Taller** directed his work.



Pictured: Blair Combest



## Memphis BioBlitz! at the Meeman Biological Station

The Meeman Biological Station hosted its 1st ever BioBlitz on Saturday April 9, 2016. What is a BioBlitz you ask? *A BioBlitz is an event that focuses on finding and identifying as many species as possible in a specific area over a short period of time. At a BioBlitz, scientists, families, students, teachers, and other community members work together to get an overall count of the plants, animals, fungi, and other organisms that live in a place.* From the [National Geographic BioBlitz page](#)

The National Geographic BioBlitz was brought to Memphis by Jonathan Carpenter (TN Geographic Alliance) and was supported many local groups (Clean Memphis, Lichterman Nature Center, Overton Park Conservancy, Shelby Farms Park Lucius Burch Natural Area, and T.O. Fuller State Park) who hosted planning and strategizing meetings and brought organization and student groups to each of the five Memphis-wide venues. Participants in the event included:

- The 9th and 10th grade students from Memphis Business Academy and Raleigh Egypt High School
- The University of Memphis [Department of Biological Sciences](#) (Dr. Randall Bayer)
- [The McKenna Laboratory of Insect Biodiversity at the University of Memphis](#) and the US National Science Foundation 1K Weevil Project (Dr. Duane McKenna)
- [The Mandel Lab](#) (Dr. Jennifer Mandel)
- The University of Memphis [Botany Club](#)
- Christian Brothers University [School of Sciences](#) (Lynda Miller)
- [Memphis Kids in Nature](#) (Kate Friedman)
- [West Tennessee Urban Forestry Council](#) (Eric Bridges)
- The University of Memphis [Center for Research and Innovation in Teaching and Learning](#) for financial assistance with bus transportation of students
- Graduate students Chris Grow (mammals), Jerad Henson (birds), Kelsi Palmer and Denita Weeks (who provided frogs and tadpoles for the mini-zoo)
- Dr. Daniel Twedt (USGS Ornithologist who lead the bird walk)
- Dr. Kimberly Terrell ([The Memphis Zoo](#))

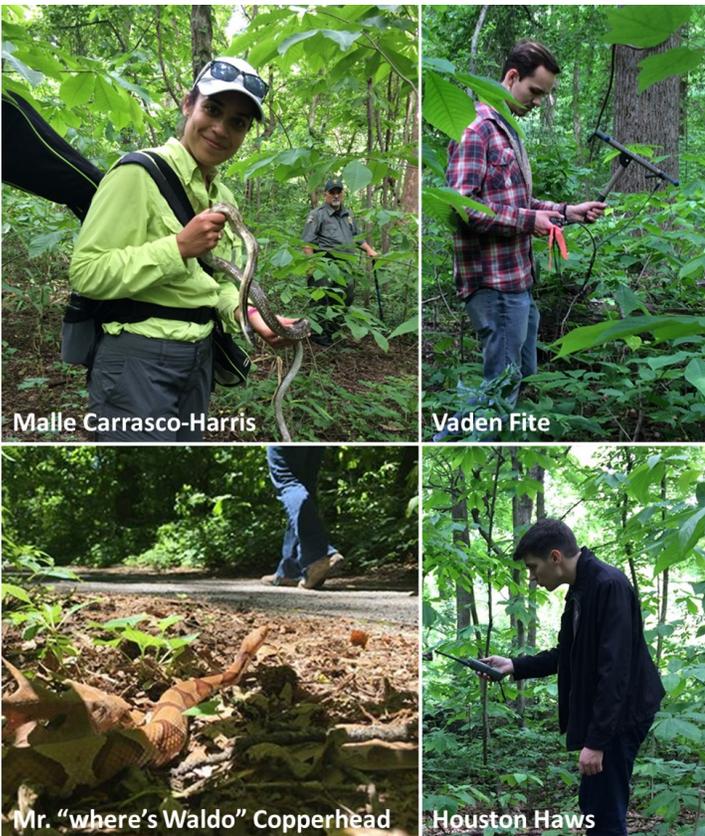
## Biologists@Large

Why yes the Chair DOES get out and do some field work! That's Dr. Bayer and Ram Thapa out collecting *Antennaria* in an undisclosed location in Mississippi.



Pictured (left-right) Ram Thapa and Dr. Randall Bayer (picture courtesy of J Mandel)

Malle Carraso-Harris was featured in a piece in the [Commercial Appeal](#) entitled "Copperheads, the top predator in Overton Park's forest, focus of study. Her study is funded by a GRFP from the National Science Foundation and employs members of the Memphis Zoo, other academic institutions across Memphis and undergraduates from the University of Memphis.



Picture courtesy of (clockwise from top left) S Reichling, M Carrasco-Harris, and C Baker

Last summer, Adam Ramsey extended his field work to the island of Nantucket where he examine how Queen Anne's Lace might be influencing pollination of a native species it closely resembles – the Toothed White-top Aster. You can read about Adam's work at the Nantucket Conservation Foundation's [website](#) and watch Adam's [movie](#) on Queen Anne's lace.



Stephanie Haddad worked with Catherine Justis from the Wolf River Conservancy to rehabilitate 2 plots of land at Shelby Farms. The goal? Butterfly habitat!



Picture courtesy S Haddad

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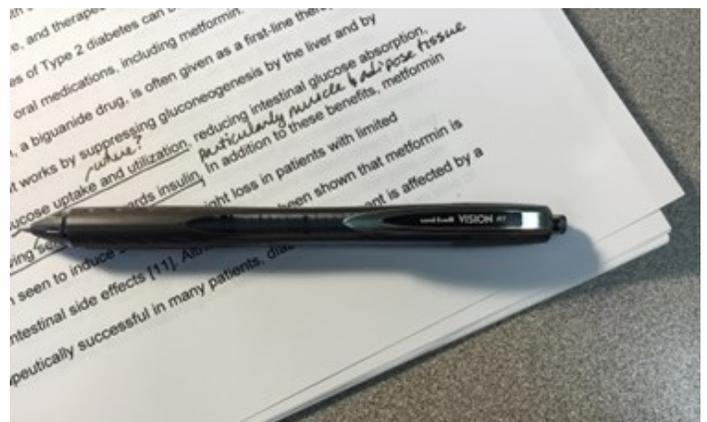
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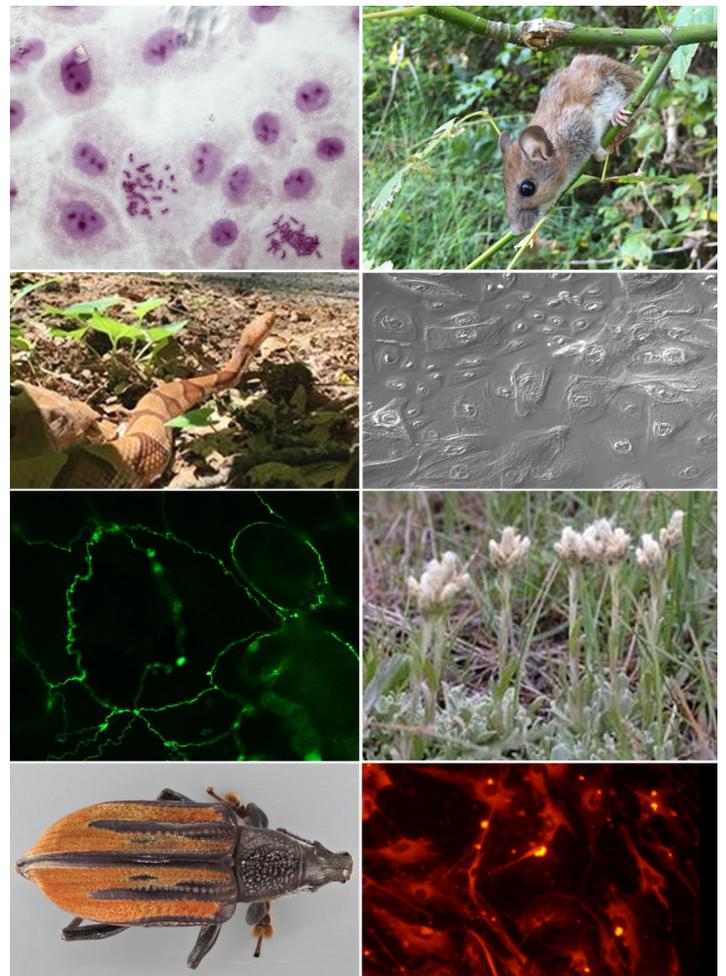
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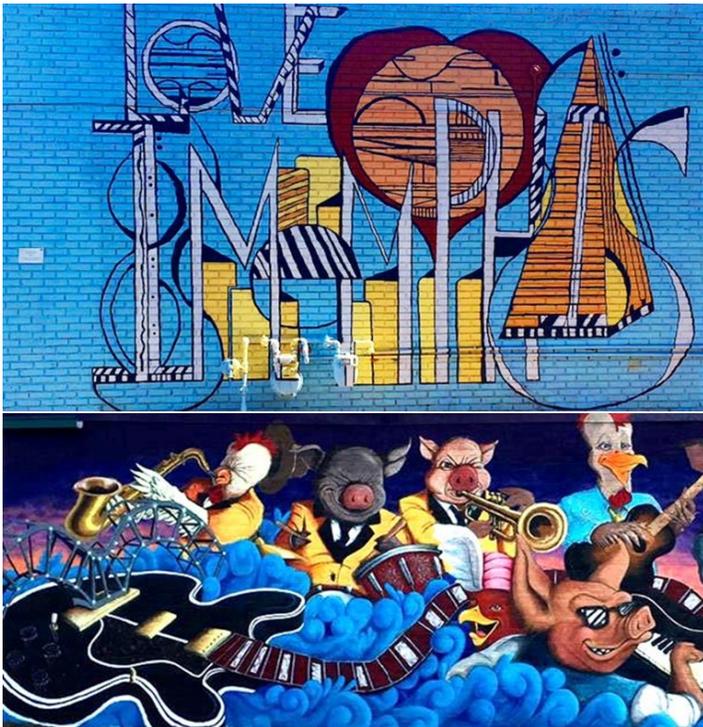
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