



BioUpdate

Department of Biology, Middle Tennessee State University

Fall 2016



Lynn Boyd

Message from the Chair

Welcome to the Biology Department newsletter. This edition contains information about the many activities our department has been involved in this past year. This has been another great year for Biology at MTSU! We completed our second year of residence in the new Science Building. We continue to appreciate this great facility.

Fall enrollment numbers show that the Biology Department at MTSU continues to be one of the most popular choices for undergraduate students. As of Fall 2016, we now have 896 majors in our department. This is an increase of 34% compared to three years ago. We are excited about this growth in our department and are confident that these students are making a good choice for their futures. Kudos to the staff and faculty in the department for this impressive growth.

The department is currently involved in three faculty searches. We are searching for a biology education faculty person, a forensic biologist, and a molecular/ecological toxicology faculty person. The search committees are going through applications now and we will have on-campus interviews in the Spring 2017 semester. Also included in those efforts will be a search for a new biology lab coordinator. David Powell, who has served in this position for the past 15 years, is making a career change. We are sad to see him go, but we thank him immensely for his service to the department and we wish him well in his new position.

Faculty and students in the department continue to do wonderful things. Last year they published 43 peer-reviewed papers and made 107 conference presentations. Our department had 182 students who were involved in research projects in laboratories and/or field projects. These experiences, along with top-notch teaching in our classrooms, demonstrate how the Biology Department provides students the excellent preparation for their future careers.

I encourage you to look through the pages of *BioUpdate* and learn about the many interesting things going on with our faculty, students, and alumni.

Lynn Boyd

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Effects of Kairomones on Snail Behavior

by Brooke Fitzwater



This summer I had the incredible opportunity to travel to Estación Costera de Investigaciones Marinas (ECIM) in Chile for seven weeks to perform marine biology research for my Honors thesis. I was able to make this project a reality through the generous financial support of an MTSU URECA grant, the Paul W. Martin, Sr. Scholarship, a Go-FundMe campaign, and the James R. Kemp Scholarship, John A. Patten Scholarship, and Wayne Rosing



Scholarship from the Biology Department, as well as the mentorship of Dr. Dennis Mullen at MTSU and Dr. Evie Wieters at ECIM. I studied the effects of chemical cues (kairomones) emitted by predators and starvation on behavior in *Tegula tridentata* (a snail found on the Chilean coast). I used flow-through systems to allow kairomones to flow from predator aquaria to the snail aquaria so the snails could detect the predators. For all of the trials, I monitored



T. tridentata behavior once an hour for at least a 24-hour period. Most trials were conducted for 72 hours, although after the first 24 hours, monitoring was less continuous. I discovered that a Chilean crab, *Homalaspis plana*, caused a stronger avoidance response by *T. tridentata*, even when they were starved for 20 days. Since Chile has a major kelp and seafood industry, this could have potential implications for the economy, as overharvesting of *H. plana* may cause *T. tridentata* to overgraze the kelp, which could have a negative impact on the Chilean economy.

This trip was both my first research experience and my first time out of the country for an extended period of time. I learned a lot of perseverance and endurance, as well as how to be flexible in the world of science and the nature of research itself. Chile is a Spanish-speaking country with a very different culture than ours. There is something daunting, but also fulfilling about developing relationships with people who speak a language that isn't your first and who have another culture. I learned to branch out a little more and be more open. I also learned that science truly is a universal language. Perhaps we couldn't always relay the things that we wanted to say to each other, but we could certainly talk science and be on the same page together even with my limited Spanish. I had the opportunity to do things I'd never done before, see places I'd never imagined I'd see. I grew a lot as a person during my time in Chile. I learned about myself, about people, and about life, and I gained a new perspective. I am also a photographer, so the Chilean coast gave me an unparalleled photography opportunity. I also made my first film in Chile ("Océano" by Brooke Fitzwater on YouTube). Most importantly, though, this trip solidified for me that I am in the right field. The ocean world is fascinating to me, and my first taste of research has left me hungry for more. I plan to continue discovering what secrets lie beneath the waves and helping others to see why the ocean is so important.



URECA Team Studies Transcriptome Analysis of Clinical *Cryptococcus neoformans* Strains



Dr. Erin McClelland

Dr. Erin McClelland and Dr. Rebecca Seipelt-Thiemann led a summer 2016 team of students in a project that investigated transcriptome analysis of *Cryptococcus neoformans*. The project was funded by an Undergraduate Research Experience and Creative Activity award for May 16 - 27, 2016. The team included undergraduates Pel Doski, Kate Brittain, Mahmuda Akter, Basant Salem, Evan Mason, Nripesh Prasad, and Fariz Ali. In addition, one graduate student in the Biology M.S. program, Mitch Merryman, was included in the team, since he is analyzing data gathered in this project for his M.S. thesis project.

The scientific goal of this project was to use next generation sequencing technologies (RNA seq) to investigate differential gene expression among clinical isolates of *Cryptococcus neoformans*, a pathogenic and

opportunistic fungus. The isolates were previously gathered from first admission HIV-positive patients in Botswana, from which other clinical data were gathered. The students gained many laboratory skills, including how to work with a pathogen, isolate RNA, and produce cDNA libraries. They worked with next-generation sequencing data using bioinformatics tools and programming in PERL. The team also visited Hudson Alpha Biotechnology where the cDNA libraries were sequenced. Students presented their data and workflow at the end of the three-week experiment and will be presenting their research at Scholar's Week in spring 2017.



Dr. Becky Seipelt-Thiemann

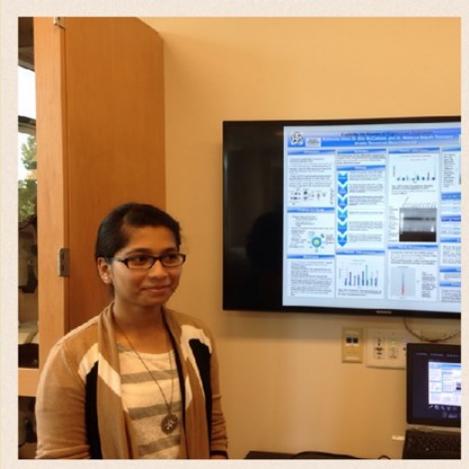


Summer 2016 URECA team, from left, Kate Brittain, Pel Doski, Mahmuda Akter, Matt Fuller, Rebecca Seipelt-Thiemann, Nripesh Prasad, Mitch Merryman, Fariz Ali, Evan Mason.

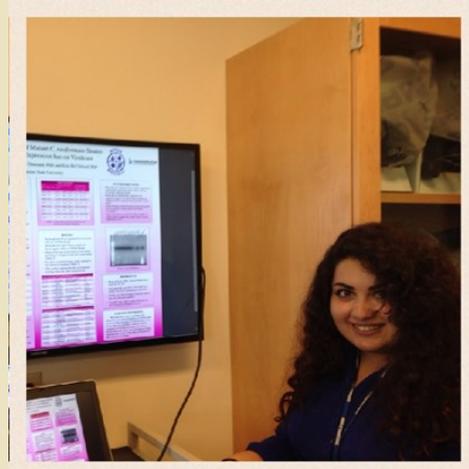


Summer 2016 URECA team visits Hudson Alpha Biotechnology for cDNA library sequencing. From left, Fariz Ali, Evan Mason, Mitch Merryman, Matt Fuller, Kate Brittain, Pel Doski, and Mahmuda Akter.

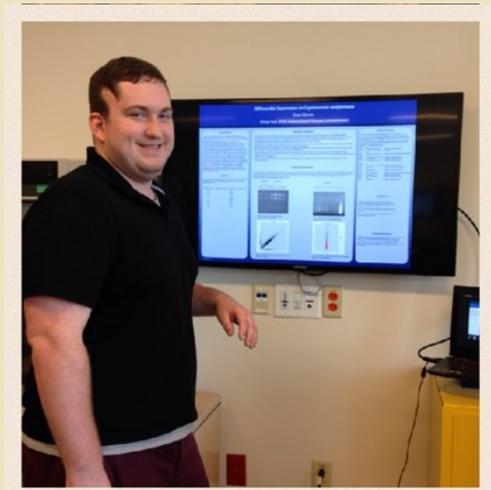
Summer 2016 URECA team members presented their data and workflow at the end of the three-week experiment. All will be presenting their research at Scholar's Week in spring 2017.



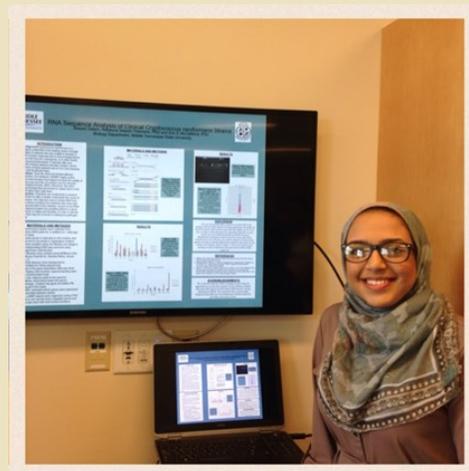
Mahmuda Akter



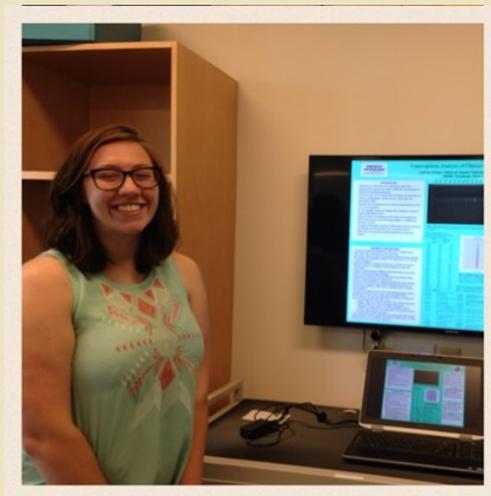
Bell Doski



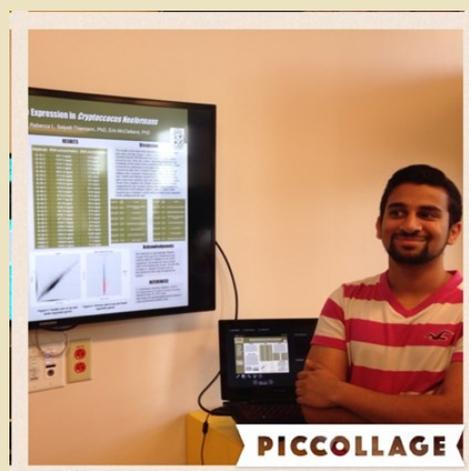
Evan Mason



Basant Salem



Kate Brittain



Fariz Ali

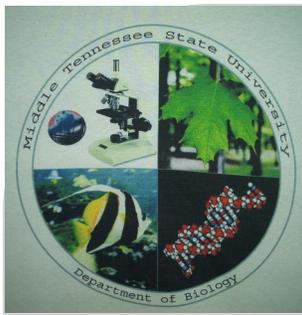
Center for Cedar Glade Studies Hosts the 10th Annual Cedar Glade Research Roundtable

On April 29, 2016, MTSU's Center for Cedar Glade Studies hosted the 10th Annual Cedar Glade Research Roundtable in conjunction with the Elsie Quarterman Cedar Glade Wildflower Festival at Cedars of Lebanon State Park. About 30 people attended the roundtable representing a broad spectrum of stakeholders in cedar glade ecology and resource management from federal and state agencies, non-governmental organizations, and academic institutions, including faculty from MTSU (**Drs. Chris Herlihy, Ashley Morris, Kim Sadler**, Mark Abolins). Presentations were given by several attendees, including a MTSU Biology student Caitlin Banaszak, covering topics from distribution of the streamside salamander to plant and fungal life of cedar glades. The Roundtable was organized by Morris.

That evening, **Dr. Thomas Hemmerly** was remembered by friends and colleagues through stories and short video about him. It was noted by his daughter, Kathy Roadarmel, that he served as a fieldtrip leader for nearly all 39 years of what was formerly known as the Wildflower Pilgrimage (the name was changed in 2008 to the Elsie Quarterman Cedar Glade Wildflower Festival). This was followed by a presentation by Tom Hunter, director of the Legacy Tree Project, based in Lebanon, TN. This nonprofit collects seeds from historical trees to propagate, grow, and sell. Sally Rollins Palmer, director of science for the Tennessee Nature Conservancy, concluded the evening with an overview of TNC's initiatives globally and in Tennessee.

Festival events on April 30 began early with a bird walk by **Melissa Turrentine** and ended late with an evening owl prowl. A series of talks and hikes were held all day with something for everyone, from flowers to insects to geology. The Nature Center at the Cedars of Lebanon has been newly renovated including the landscaping. Native plants and gardening with native plants was showcased by Linda Robertson (**Dr. Brian Robertson's** aunt). Sharen Bracey led an edibles in nature hike, which was very popular. Families enjoyed the Scavenger Hunt as they learned about aspects of cedar glades by visiting different stations in different locations around the Nature Center. Participants who completed the event planted Tennessee coneflower seeds to take home to their garden. Lengthier hikes for those interested in seeing the exceptional blooming flowers in the glades were led by Milo Pyne, Dennis Horn, and Darel Hess. As with any outside event, the weather is always a factor but the rain did not delay or get in the way of a great day learning about glades! Festival events were organized by Sadler and Buddy Ingram, superintendent at Cedars of Lebanon.





Department Graphic Shirts and More

The department is selling shirts, backpacks, insulated lunch bags, coffee mugs, lanyards, and stadium cups that sport the department graphic. The shirts come in six styles: a light tan short-sleeve or long-sleeve T-shirt with the name on the upper-left front and an enlarged color graphic on the back; a dark green short-sleeve or long-sleeve polo shirt with the graphic embroidered on the upper-left front; and any color combination short- or long-sleeve

T-shirt with a large graphic on the front. Several faculty and students have been wearing the shirts. The coffee mugs are white with the graphic in blue on both sides (visible whether you are right- or left-handed). The stadium cups are 16 ounce blue plastic with a white MTSU Biology graphic. The key lanyards are blue ribbed-polyester cord with a white MTSU Biology graphic.

Come by and check out the merchandise in SCI 2044. You might even want to add your own personal flair by Custom-ordering a T-shirt with your favorite color combination. T-shirts can be ordered in short or long sleeves. We can special-order hoodies (including RealTree camo). Prices are as follows (cash only):

T-shirts	Short-sleeve:	\$12.00	Insulated lunch bag:	\$8.00
	Long-sleeve:	\$16.00		
Polo shirts	Short-sleeve:	\$25.00	Drawstring backpack:	\$5.00
	Long-sleeve:	\$28.00	Coffee mugs:	\$3.00
	Pull-over hoodie:	\$28.00	Stadium cups:	\$1.00
	(printed like T-shirts)		Key lanyards:	\$2.00

All items can be purchased (cash only) in the department office from Virginia McKnight (615-898-2291) or by email from Becky Elrod (Rebecca.Elrod@mtsu.edu). Purchases are not tax-deductible.



From the lab of Lynn Boyd

The Boyd lab is engaged in two major projects: the ubiquitination of sperm organelles after fertilization (the “sperm project”) and the localization of ubiquitin and proteasome to nuclear stress bodies (the “SING project”). In April 2015, the lab was awarded an NIH grant to fund the sperm project and is preparing a proposal for funding for the SING project. The lab welcomes a new M.S. student and a new research assistant, along with several undergraduate student researchers. **Jacob Sanders** successfully defended his M.S. thesis and graduated this past year. Below is a list of all lab members, along with a brief statement of their current projects:

Paola Molina (Ph.D. student): sperm project: finally nearing the end of that darn screen.

Katie Sampuda (Ph.D. student): pioneer of the SING project: writing a paper is her “reward” for collecting so much data.

Josh Evers (M.S. student): participating in the genetic screen for SING components.

James Hayes (research assistant): sperm project: ubiquitin localization in *C. briggsae* and development of CRISPR techniques for the lab.

Marshall Baughman (undergraduate student): how tough are these *ubc-18* mutant worms anyway?

Daniel Batie (undergraduate student): is *ubc-18* required for intestinal SINGs; also involved in the SING screen.

Roseanna Durnell (undergraduate student): making media and also involved in the SING screen.

Chelsea Molina (undergraduate students): making media and soon to be involved in the SING screen.

Paola Molina presented at the *C. elegans* development meeting in Orlando, FL. **Sampuda** and **Boyd** ventured to the *C. elegans* Stress meeting in Madison, Wisconsin. Posters were presented and many discussions were had with other worm researchers.

The three also hosted a workshop for Expanding Your Horizons again this year. It is always fun to hang out with the young girls and introduce them to the worms. See the attached picture of them joking around at the EYH photo booth.

The Boyd lab is looking forward to the year ahead. Sampuda is on track for graduate this year and everyone is hoping to get the major SING paper published. Members of the Boyd lab invite you to visit its web page or in person.



From the lab of Andrew Brower

Former student **Jess Matz's** (M.S., 2013) thesis on the taxonomy of south temperate pronophiline butterflies was published summer 2016 as a monograph in *Zootaxa*. Brower recently published a long-awaited book chapter, "Are We All cladists?" in the Systematics Association's *The future of phylogenetic systematics - the legacy of Willi Hennig* (Cambridge University Press), which had its origins at a talk he gave at the Linnean Society in London in 2013.

Brower has diversified his research program into biology education, publishing an article, "Rethinking Tree-thinking: Cladograms, Ancestors and Evidence" in *American Biology Teacher*. His NSF grant supporting research on the spatial and temporal patterns of biodiversity in the Amazon basin is in its final year, and this fall he will be going to a workshop in São Paulo to synthesize the results with collaborators. Later, he will head to Buenos Aires for the Willi Hennig Society annual meeting, as society council member and associate editor of the journal, *Cladistics*.

On the home front, Andy has been building a representative collection of the local moth fauna by collecting at the porch lights of his home in Christiana. This collection now represents about 20 families and over 300 species. Along with his wife, Darlene, they brought two new baby horses into the world last spring: Swedish Warmblood colt "Jasper" and Oldenburg filly "Harvest." Harvest was recently recognized by the Oldenburg-ISR registry as a premium foal and champion of her inspection class.



From the lab of Sarah Bergemann

Bryce Kerr, a graduate student in Bergemann's lab traveled to Berkeley, California, in August 2016 to present his poster “The Distribution and Prevalence of the Generalist Pathogen, *Armillaria mellea*, in Eastern North America Using Ecological Niche Modeling,” at the 2016 Mycological Society of America Conference. The poster discussed implementations of modern niche modeling and species verification methods to generate maps predicting pathogen presence based on environmental conditions. The conference lasted four days and hosted 183 talks and 156 posters with topics ranging from fungal biodiversity to biofuels.

(continued on page 11)



2016-17 Graduate Teaching Assistants

For the 2016-17 academic year, the department is providing support to 26 M.S.-level and 21 Ph.D.-level graduate students who serve as graduate teaching assistants (GTAs). Twenty of these students have received undergraduate degrees from colleges and universities other than MTSU. Thirteen hold baccalaureate degrees in subjects other than biology (anthropology, biochemistry, botany, chemistry, environmental science, history, microbiology, and plant and soil science). Three of these assistants have received baccalaureate or master's degrees from universities outside the United States. All have the requisite training in biology to serve as departmental teaching assistants. Without these GTAs, the department would be unable to offer the many sections of the nonmajors biology course (BIOL 1030) and the majors freshman courses (BIOL 1110/1120), along with some sophomore and junior laboratories. The department is very pleased to have them.

MASTER'S GRADUATE TEACHING ASSISTANTS

Haneen Alhams, B.S., Biochemistry, 2014, Middle Tennessee State University
Jon Ashely, B.S., Biology, 2012, The State University of New York at Potsdam
Richard Bautista, B.S., Biochemistry, 2015, Middle Tennessee State University
Jennifer Benetti-Longhini, B.S. Biology, 2013, Middle Tennessee State University
Erin Floyd, B.S., Anthropology, 2014, Middle Tennessee State University
Emily Gain, B.S., Biology, 2012, University of Tennessee-Chattanooga
Meagan Garrison, B.S., Biology, 2012, Middle Tennessee State University
Nicholas Gonder, B.S., Biology, 2015, Middle Tennessee State University
Zach Grimes, B.S., Biology, 2015, Middle Tennessee State University
Jesse Harris, B.S., Biology, 2016, University of Tennessee-Chattanooga
Amber Hills, B.S., Environmental Biology, 2012, Tennessee Technological University
Brady Inman, B.S., Biology, 2016, Middle Tennessee State University
Bryce Kerr, B.S., Biology, 2015, Appalachian State University
Eric Limbird, B.S., Plant and Soil Science, 2013, Middle Tennessee State University
Louise McCallie, B.S., Biology, 2015, Lehigh University
Mitch Merryman, B.S., Biology, 2015, Middle Tennessee State University
Spencer McDaniel, B.S., Biology, 2014, Middle Tennessee State University
Hunter Morrow, B.S., Biology and Chemistry, 2015, Middle Tennessee State University
Connor Olson, B.S., Biology, 2015, Middle Tennessee State University
Emily Orbison, B.S., Biology, 2014, Middle Tennessee State University
Phillip Parsley, B.S., Biology, 2012, Belmont University
Virginia Poole, B.S., Plant Biology, 2010, University of California-Davis
Walter Reichard, B.S., Biology, 2015, Middle Tennessee State University
Linda Sircy, B.S., Biology, 2013, University of Tennessee-Chattanooga
Emily Smith, B.S., Biology, 2015, Middle Tennessee State University
Anna Scoccimaro, B.S., Biology, 2016, Davidson College



2016-17 Graduate Teaching Assistants

Ph.D. GRADUATE TEACHING ASSISTANTS



Ali Ali, B.S., 2003; M.S., 2010, Benha University

Brock Arivett, B.S., Biology, 2005; M.S., Biology, 2014, Middle Tennessee State University

Jonathan Logan Bowling, B.S., Biology, 2013, Middle Tennessee State University

Penny Carroll, B.S., Biology, 2013, Middle Tennessee State University

Tina Carter, B.S., Biology; M.S., Biology, Middle Tennessee State University

Pratima Chapagain, B.S., Microbiology, 2009; M.S., Microbiology, 2012, Tribuwan University Nepal

Ashley Cole, B.S., Microbiology, 2005; M.S. Professional Science, Biotechnology, 2008, MTSU

Jacob Crigler, B.S., Biology, 2008, University of Tennessee-Knoxville

Chris Davis, B.S., Biology and History, 2007, Middle Tennessee State University

Alison Dorris, B.S., Biology, 2010, University of Tennessee-Chattanooga; M.S., Biology, 2014, Tennessee Technological University

Tiffany Guess, B.S., Biology, 2004, Middle Tennessee State University

Ashlin Harris, B.S., Biology, 2016, Middle Tennessee State University

Destaalem Kidane, B.S., Biology, 2009; M.S., Biology, 2012, Georgia College and State University

Paola Molina, M.S., Biology, 2012, Middle Tennessee State University

Velta Napoleon-Fanis, B.S., Biology, 2005, Andrews University; M.S., Biology, 2013, University of Nebraska

Bam Paneru, B.S., Microbiology, 2011, Tribhuvan University, Nepal

Hyo Erin Park, B.S., Biology, 2009, Middle Tennessee State University

Melissa Pompilius, B.S., Chemistry, 1998, Northern Arizona University; M.S., Biochemistry, 2001, University of Nevada-Las Vegas

Joshua Reid, B.S., Biology, 2014, Athens State University

Jeannie Stubblefield, B.S., Microbiology, 2011, Middle Tennessee State University

Caleb Sutton, B.S., Biology, 2011, Tennessee Technological University

Let us hear from you...

BioUpdate wants to feature the accomplishments of alumni, and we encourage you to update us!

Send us your name, MTSU degree/year, and an update of your professional/career activities, awards, and accomplishments. You may also include any personal news of interest that you would like to share with our readers.

Please include an email address so we can contact you if we need additional information.

Send contact information and updates to:

Biology Department, MTSU Box 60, Murfreesboro, TN 37132

Fax: 615-898-5093

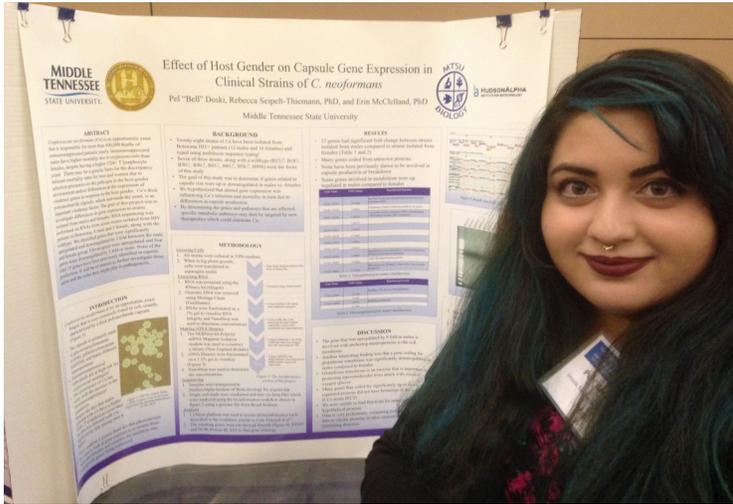
E-mail: John.Dubois@mtsu.edu



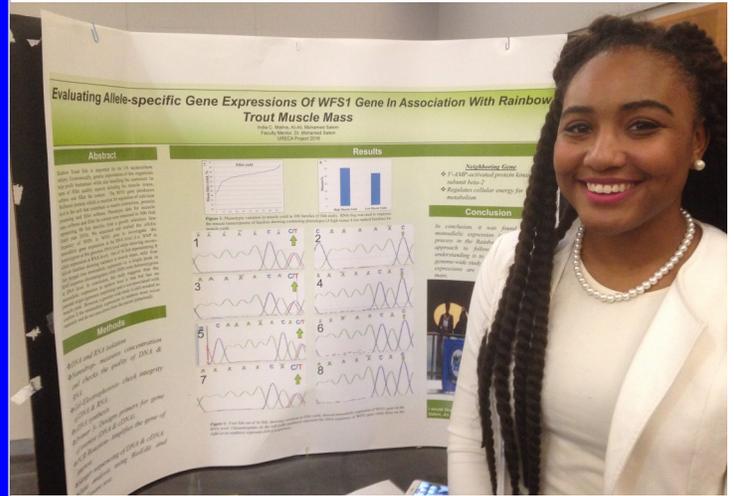
Tennessee Experiential Learning Symposium Highlights Student Research

The Second Annual Tennessee Experiential Learning Symposium was held in conjunction with the 25th Annual Undergraduate Social Science Symposium at MTSU October 20-21, 2016. The symposium held scheduled oral presentations and poster presentations. The Department of Biology contributed six posters to the Friday session.

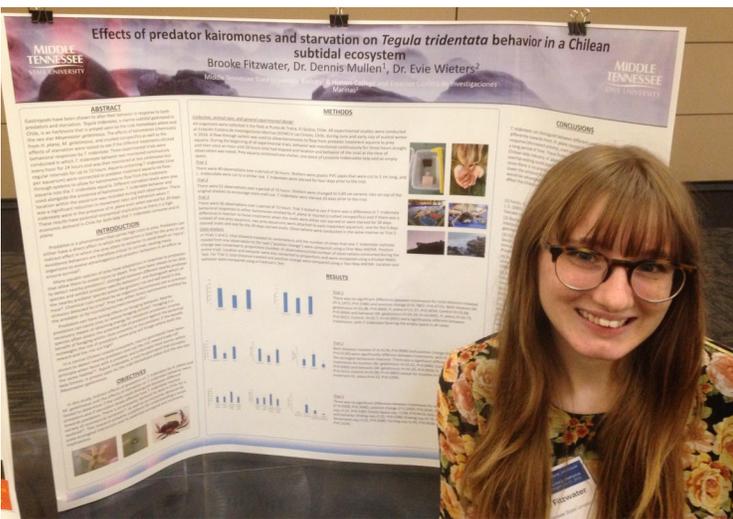
Pel “Bell” Doski, Rebecca Seipelt-Thiemann, and Erin McClelland presented “Effect of Host Gender on Capsule Gene Expression in Clinical Strains of *C. neoformans*.”



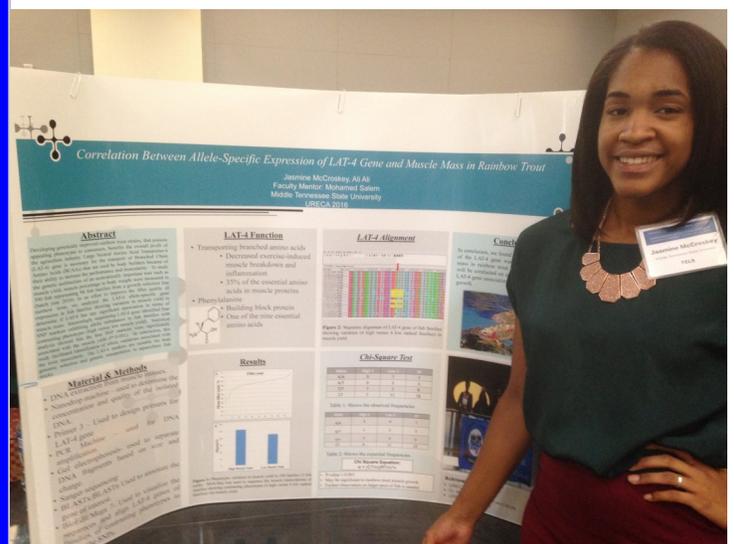
India Mathis, Ali Ali, and Mohamed Salem presented “Evaluating Allele-Specific Gene Expressions of WFS1 Gene in Association with Rainbow Trout Muscle Mass.”



Brooke Fitzwater, Dennis Mullen, and Evie Wieters presented “Effects of Predator Kairomones and Starvation on *Tegula tridentata* Behavior in a Chilean Subtidal Ecosystem.”

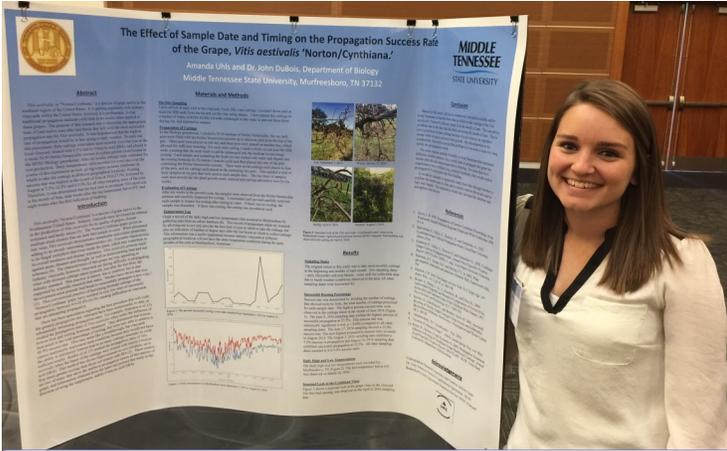


Jasmine McCroskey, Ali Ali, and Mohamed Salem presented “Correlation Between Allele-Specific Expression of LAT-4 Gene and Muscle Mass in Rainbow Trout.”

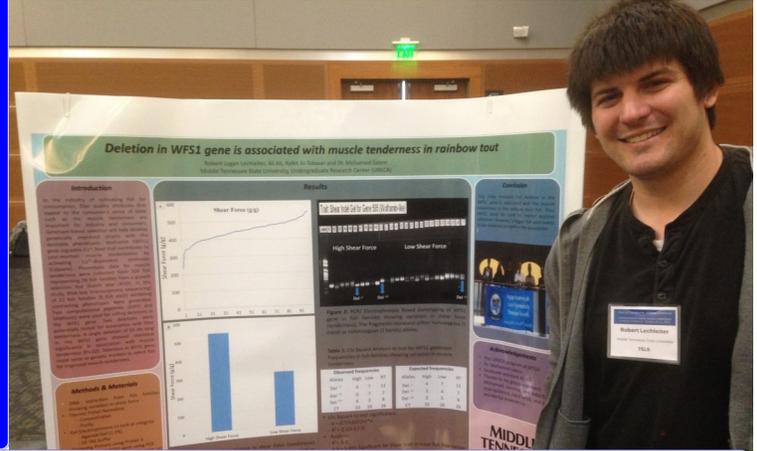


TELS cont.

Amanda Uhls and **John DuBois** presented “The Effect of Sample Date and Timing on the Propagation Success Rate of the Grape, *Vitis aestivalis* ‘Cynthiana/Norton’.”



Robert Lechleiter, **Ali Ali**, **Rafet Al-Tobasei**, and **Mohamed Salem** presented “Deletion in WFS1 Gene is Associated with Muscle Tenderness in Rainbow Trout.”



From the lab of John DuBois

The past several months have been very busy in the DuBois lab. In July, DuBois and **Aimee Wilson** (Honors thesis student) traveled to Honduras with Dr. Tony Johnston (ABAS) and his TLSAMP students to study agriculture in a third-world country. While there, Wilson presented her protocol for getting *Vitis aestivalis* grapes into tissue culture to the students at Zamorano University.



In October, **Evidence Nwangwa** and **Cassandra Mihalko** successfully presented their thesis proposals to the Honors College. Nwangwa is investigating polysaccharides produced by American Ginseng (*Panax quinquefolius*) callus, and Mihalko is studying neoandrographilide production by King of Bitters (*Andrographis paniculata*) callus. **Wilson** and **Amanda Uhls** both successfully defended their theses to the Honors College. Wilson devised a protocol for tissue culturing grapes (*Vitis aestivalis*), and Uhls studied the effect of sampling date and timing on stem propagation of the grapes. Amanda presented her research at the TELS Conference held at MTSU October 21, 2016.

New members to the lab are **Kayla Thomas** and **Xoe Thacker**. They will be conducting their Honors thesis research on establishing protocols to tissue culture industrial hemp (*Cannabis sativa*; part of an initiative of the TCBMR). Thomas will be investigating the mineral

requirements and Thacker will be studying the hormone levels and ratios in tissue culture media.



Aimee Wilson with a *Vitis aestivalis* grapevine in LaPaz, Honduras



Aimee Wilson and John DuBois, along with Maria Bravo, director of the tissue culture lab at Zamorano University in Honduras

From the lab of Erin McClelland



Undergraduate student **Yusra Mohammed** graduated in May and then presented a poster of her Honors thesis research at the American Society of Microbiology general meeting in Boston in June.

Full-Time Temporary and Adjunct Faculty Play Major Roles

The combination of increased enrollment and decreased funding creates a challenge when it comes to assigning instructors to the ever-growing number of course sections. This need is met primarily by full-time temporary and adjunct faculty. This academic year, the department has hired three full-time temporary and two adjunct faculty members. All five hold doctoral degrees.

These faculty are teaching Exploring Life, General Biology, Human Anatomy and Physiology I and II, Comparative Anatomy of the Vertebrates, General Ecology, and Radiation Biology. Considering the expertise of each of these instructors, their students are obviously getting a great education. Their service to the department not only helps fill instructor roles, but also helps fill in for research faculty who have received grants and/or contracts that include release time. A few of these instructors are using some of their out-of-class time to conduct their own research, often including graduate and undergraduate students. The department is forever grateful for their service.

Full-Time Temporary Faculty

Dr. Danielle Brown, B.S., 2001, Cornell University; M.S., 2006, Ph.D., 2011, University of California-Davis. Teaching: General Biology lecture and Anatomy and Physiology I labs

Dr. Siti Hidayati, B.S., 1986, University of Gadjah Mada, Yogyakarta, Indonesia; M.S., 1993, Ph.D., 2000, University of Kentucky. Teaching: General Ecology and General Ecology labs

Dr. Alicja Lanfear, B.S., 2006, Cumberland University; M.S., 2008, Middle Tennessee State University; Ph.D., 2012, University of Tennessee-Knoxville. Teaching: Exploring Life lecture and Anatomy and Physiology I labs

Dr. Christopher Brian Manning, B.S., 1996; M.S., 1998, Middle Tennessee State University; Ph.D., 2003, University of Vermont. Teaching: Anatomy and Physiology I labs, Anatomy and Physiology II labs

Dr. Amy Massengill, B.S. 1993, Stetson University; D.V.M., 1997, University of Florida. Teaching: Anatomy and Physiology II labs and Comparative Anatomy of the Vertebrates labs

Adjunct Faculty

Dr. Sarah Barlow, B.S., 1959, M.A., 1965, Middle Tennessee State College; Ed.D., 2000, Tennessee State University. Teaching: Exploring Life Lecture

Suzanne Hicks, B.S., 2009, M.S., 2014, Middle Tennessee State University. Teaching: Exploring Life lab

Elizabeth Otter, B.S. 2002, Michigan State University; M.P.A.S., 2005, Chatham University. Teaching: Anatomy and Physiology I lab

Angelique Troelstrup, B.S., 2000, M.S., 2003, Ph.D., 2016, Middle Tennessee State University. Teaching: Exploring Life Lecture

Dr. Moses Prabu, B.S., 1991, M.S., 1993, The American College; Ph.D., 1998, Indian Institute of Science. Teaching: Radiation Biology

BioUpdate

Lynn Boyd, department chair (Lynn.Boyd@mtsu.edu)

John D. DuBois, editor (John.Dubois@mtsu.edu)

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<http://www.mtsu.edu/titleix/>.

Biology Department Scholarship Winners, 2016

Each year the Biology faculty is honored to be able to work with outstanding students who excel in the classroom, conduct independent research, attend courses at field stations, present papers at scientific meetings, and perform exceptionally well on national standardized tests. To help defray the costs of these activities and to recognize these students, the department is pleased to offer a number of scholarships. Although these scholarships include monetary awards, their intention is to recognize students for efforts above and beyond the expected. The Biology faculty congratulates every student recipient.

Clay M. Chandler Outstanding Freshman Biology Award and Scholarship: Awarded annually to an outstanding student in general biology classes.

Danielle Bonner

Ralph E. Sharp Outstanding Sophomore Award and Scholarship: Awarded annually to a Biology major of sophomore standing.

James Beckner Hannah Hall

Philip M. Mathis Outstanding Junior Award and Scholarship: Awarded annually to a Biology major of junior standing.

Natalie Musselman

Peter I. Karl Outstanding Senior Award: Awarded to a Biology major of senior standing who will graduate in May or August or who graduated in December.

Andrew Nolin

Elliott Dawson/BioVentures Biotechnology Scholarship: Awarded to a Biology major of junior standing or above who has taken or is currently enrolled in Biotechnology.

Serenah Smith

C.W. Wiser Medical/Allied Health Award and Scholarship: Awarded to a graduating student who will continue studies in the medical sciences at a school of medical technology or other allied health field. **Ciara Taylor Samanwi Munagala**

Freeman P. Jordan Jr. Scholarship: Awarded to a Biology major in support of research in Microbiology or Molecular Biology.

Lara Jarnagin

James R. Kemp Scholarship: Awarded to a Biology major of junior or senior standing (minimum of 85 hours earned) minoring in Secondary Education.

**Yusra Mohammed Brooke Fitzwater
Gabrielle Armour**

George Davis Scholarship: Awarded to a non-traditional Biology major of sophomore standing or above.

Jessica Earls

John D. DuBois Scholarship: Awarded to an undergraduate or graduate student to provide travel for paper presentations at scientific meetings.

James Hayes

Mary C. Dunn Graduate Scholarship: Awarded to support research efforts.

Bryce Kerr Emily Smith

Sarah Barlow Scholarship: Awarded to graduate teaching assistant who plans to teach at the secondary or college level.

Emily Orbison

John A. Patten Scholarship: Awarded to a Biology major of sophomore or above (including graduate) standing for research support or summer study.

**Victoria Lay Jordan Jatko
Lara Jarnagin Yusra Mohammed
Brooke Fitzwater Gabrielle Armour**

J. Gerald Parchment Scholarship: Awarded to a Biology major of sophomore or above standing for summer study or academic year research.

Victoria Lay

Marion R. Wells Graduate Research Scholarship: Awarded to provide support for thesis research conducted during summer months.

Erin Floyd

George G. Murphy Research Scholarship: Awarded to an undergraduate or graduate student to purchase supplies or support travel associated with research projects.

Emily Smith

Biology Department Scholarship Winners, 2015

Padgett Kelly Research Scholarship:

Awarded to an undergraduate or graduate student to support summer studies of field research in ecology or conservation biology.

Bryce Kerr

Kurt E. Blum Botany Research Scholarship:

Awarded in support of graduate research in botany.

Virginia Poole

William H. Butler, Jr. Graduate Research

Scholarship: To provide support for expenses associated with thesis research

Linda Sirey

Kevin Driver Memorial Scholarship: Awarded to a student of Junior standing with an interest in organismal biology, physical therapy, or sport medicine.

Victoria Lay

Mary C. Dunn Honorarium: Awarded in support of graduate research.

Bryce Kerr Emily Smith
Katharine McCallie

Dennis Mullen Vertebrate Biology/Aquatic Ecology Research Scholarship: Awarded to graduate students engaged in research in vertebrate biology or aquatic ecology.

Connor Olson

Maria de los Reyes Microbiology Scholarship:

Awarded to a Biology major of sophomore standing or above who has declared an emphasis in Microbiology.

Jordon Jatko

Wayne Rosing Biology Scholarship: Awarded to a Biology major of junior standing with a Botany emphasis and a minor in Secondary Education

Lara Jarnagin Gabrielle Armour
Brooke Fitzwater

Patrick J. Doyle Freshman Scholarship:

Awarded annually to an incoming freshman Biology major. Given to the third-place scorer on a departmental exam given in April.

Cayla McNeal Taylor Morrow

David Sanborn Ecology Scholarship: Awarded to an outstanding junior that has shown an interest in the area of field biology.

Leah Chism Gabrielle Armour

Eugene F. Strobel Scholarship: Awarded to a Biology major of junior standing who plans a teaching career at the secondary or college level.

Lara Jarnagin Jordan Jatko

J.L. Fletcher Graduate Scholarship: Awarded to a beginning Biology graduate student.

Zach Grimes

Thomas Hemmerly Graduate Research Scholarship: Awarded to provide support of expenses associated with thesis research.

Linda Sirey

Brian Miller Graduate Research Scholarship: To support research of second-year graduate students conducting field studies on herpetology or biospeleology in Tennessee. Award is for purchase of equipment or supplies or to support travel to and from research sites.

Jonathon Ashley

Stephen M. Wright Research Scholarship: Awarded to support any aspect associated with undergraduate research in microbiology or biotechnology.

Jordan Jatko

John M. Zamora Graduate Research Scholarship: Awarded to purchase supplies or support travel associated with research projects.

Erin Floyd