BioUpdate

Department of Biology, Middle Tennessee State University

Fall 2015

Lynn Boyd

In this issue

Message from the Chair

First, thank you for your interest in the Biology Department. This has been a great year for biology at MTSU! We completed our first year of residence in the new Science Building. The new building truly is a dream come true for our department. If you have not yet been able to visit and experience the amazing new facility, I strongly encourage you to stop by.

Fall enrollment numbers show that the Biology Department continues to be one of the most popular choices for undergraduate and graduate students. In a time when many colleges and departments are experiencing declines in enrollment, the Biology Department is experiencing growth. In Fall of 2015, there are 107 more biology majors (total of 842) than there were in Fall of 2014. That is an increase of 15 percent! We are very excited about this growth and are confident that these students are making a good choice for their futures. Many kudos to all staff and faculty in the department for this impressive growth.

I want to use this opportunity to thank the many people who make contributions to the department. The department is very grateful for the many gifts from our generous donors. These gifts allow the department to support students in their courses and their research activities. For example, last year the Biology Department awarded $19,603 in scholarships to deserving MTSU Biology students. Some of these funds were used to support research endeavors by student/faculty teams. These research activities resulted in 40 peer-reviewed journal articles and 98 conference presentations last year. The Biology Department will continue to make significant contributions in the area of research and student training.

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.

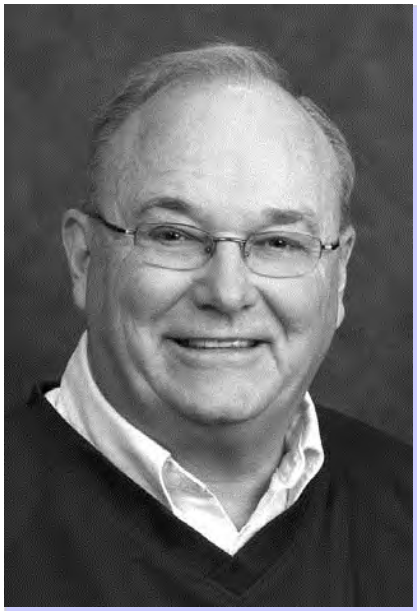
Lynn Boyd

BioUpdate is Now Twice per Year!

Starting this fall, *BioUpdate* will be a semi-annual publication of the MTSU Department of Biology. Recent issues of the newsletter were getting to be lengthy (25+ pages) and being only once per year, the information was not as timely. Although this issue is rather long, it is anticipated that future semi-annual issues will be shorter. Therefore, the newsletter will be issued twice per year. We hope you enjoy getting more timely information about the department.

Retired Faculty

This past year, the department saw the retirement of three faculty members. Drs. Padgett Kelly, Charles McGhee and George Murphy, together representing 106 years of service to the Department of Biology, retired to calmer, more peaceful lifestyles. All three made significant contributions to the department, the university and the state of Tennessee and their absence will be noticed.



Dr. Padgett Kelly started at MTSU as an undergraduate student. During his first semester, he took his first biology course under Dr. Wymer Wiser. That was all it took to get him hooked on biology. He credits Dr. Wiser and Dr. John Patton, along with Professor George Allen, for turning him on to biology. After receiving his baccalaureate degree in 1967, Kelly stayed in the department as a master's student under the mentorship of Dr. Marion Wells. (He was Dr. Wells' first graduate student.) At the same time, he was teaching high school biology at his alma mater, Dickson High School. He completed his master's in 1969 and headed to Mississippi State University in search of his Ph.D., which he received in 1975.

He began his collegiate teaching career at Bethel College in McKenzie, Tennessee. There, he was a one-person biology department for four years. Dr. Kelly left the ranks of academia to become the state director of conservation education in Tennessee, in which capacity he founded Project C.E.N.T.S. (Conservation Education Now for Tennessee Students). He presented workshops and developed curriculum on conservation education for use throughout the state. He returned to collegiate teaching in 1991 as professor in the Biology Department at MTSU. Since then, he has taught the non-majors Biology course, the old Zoology course and Biology for Elementary Teachers. He has also taught Biome Analysis during summers in the Florida Keys and spring breaks in Maui. Dr. Kelly has conducted over 50 trips to Maui to look at coral reef fishes and the rainforests. He calls himself a "shameless Maui lover!" The most enjoyable part of his job was working with pre-service teachers in the Biology for Elementary Teachers course and the Biome Analysis course in the Florida Keys. His students credit him with turning them on to biology just like his mentors did for him.

Since 1991, Padgett was co-director of the MTSU Center for Environmental Education (CEE). In this capacity, he presented numerous workshops for both teachers and students, most notably with the assistance of a 68-foot-long, inflatable humpback whale. He estimates he has given over 250 whale presentations to more than 200,000 high school students. During his time at Project C.E.N.T.S. and the CEE, he presented workshops to more than 30,000 teachers. Dr. Kelly's work with environmental education garnered him several local and national awards. In 2001, he received the Outstanding Teacher Award from the National Marine Educators Association (NMEA), the largest organization of marine educators in North America. In 2006, the NMEA elected him to its board of directors, making him the board's only director from an inland state. He was also co-chair of the NMEA Conference Committee. Some of his other awards include the 2005 Career Achievement Award from the Tennessee Environmental Education Association and the 2006 Outstanding Aquatic Educator Award from the Tennessee Educators of Aquatic and Marine Science. In January 2008, he was named Most Valuable Trainer by the Population Connection, a population education organization in Washington, D.C.

Now that he is retired, Dr. Kelly plans to enjoy fishing (in Maui, the Florida Keys, and at his place on Kentucky Lake). He says his favorite fish is anything, that will bite! He also plans on spending time kayaking, golfing and with his daughter, Jennifer and grandson, Henry Wayne Hall, in California.

Retired Faculty

After graduating from high school, **Dr. Charles McGhee** joined the Air Force, spending time at Elmendorf A.F.B. in Anchorage, Alaska, and at Donaldson A.F.B. in South Carolina. After his discharge from the Air Force, he enrolled at Middle Tennessee State College where he completed a B.S. degree in biology in 1962 and a master's degree in 1963. Upon completion of his master's degree, he taught in the Biology Department for one year before marrying Anna Cummings, moving to Baton Rouge, Louisiana, and matriculating at Louisiana State University. After one year at LSU he moved in order to enroll in the Ph.D. program at Virginia Polytechnic Institute in Blacksburg, VA., where he completed the doctoral program in 1970, one year after rejoining the biology faculty at MTSU. During a four decade-long tenure at MTSU, Dr. McGhee has taught a number of courses including General Biology, Entomology, Invertebrate Zoology, and Evolution. For eight summers he taught Entomology and Aquatic Invertebrate Zoology at Tech Aqua Biological Station (Tenn.). As a member of the graduate faculty, he has directed the thesis research of several M.S. students, as well as the research projects of many undergraduates. An authority on phalangid (daddy longlegs) systematics, he has published a number of papers in the *Journal of Arachnology* and in the *Journal of the Tennessee Academy of Science.* Not only has he contributed through teaching and research, but also through public service courses for teachers and involvement with local and international science fairs, through professional consultations, newspaper publications, and involvement in local environmental concerns. An active outdoorsman, he holds several prestigious awards from the Boy Scouts of America including the Long Rifle Award and Woodbadge (the "Ph.D." of scouting). He has maintained professional memberships in a number of organizations, and is a Fellow in the Tennessee Academy of Science.

Professionally, McGhee's first love has always been teaching–something he truly enjoyed. When asked what he considers the most important thing that he can leave with his students, he replied: "I want to leave my students with what Dr. Patten (former biology chair at MTSU) and Dr. Holt (his advisor at VPI) left me with–a love of biology, an analytical way of thinking, a healthy degree of skepticism, proper humility, and a desire to comport myself responsibly and with dignity."

Hobbies or avocations that Dr. McGhee enjoys include: woodcarving, photography, trout fishing, camping, caving, swimming, and hiking. Readers of *BioUpdate* may be aware of the fact that he also writes poetry. His poem "Spring Again" received an Honorable Mention Award in a competition held by the Iliad Press. He was honored with a Certificate of Achievement in Poetry from The Amherst Society. As stated by his good friend, Dr. Philip Mathis, "With McGhee, what you get is not a narrow specialist, but a man of many interests, a true generalist, the full-meal-deal, a man for all seasons, a modern day hill-plaid who bears a love of the mountains and the steel blade!"

Dr. George Murphy is a native Tennessean, born and reared in Montgomery County. Following graduation from Montgomery Central High in 1961, he entered Austin Peay State College (University) where he earned a B.S. degree in Biology with a minor in Chemistry. In 1967 he earned a master's degree in Zoology from Mississippi State University, and, three years later, a Ph.D. from the same institution.

Murphy joined the MTSU faculty as an assistant professor in 1969 and continued to work toward completing his doctoral dissertation, which he managed to do during his first year of service. He was promoted to associate professor in 1974 and to full professor in 1979. Dr. Murphy succeeded Dr. John Patten in 1980 as department chair. As a faculty member, he inaugurated many new courses and taught many others. A partial list of courses he taught includes: Biological Science, Biological Diversity, General Biology, Biome Analysis, Herpetology, History of Biology, Ichthyology, Mammalogy, and Vertebrate Zoology. In the 1970s and '80s, he was a "regular" among those teaching at the Upper Cumberland Biological Station at Tech Aqua. During his last two

(*continued on page 4*)

Retired Faculty

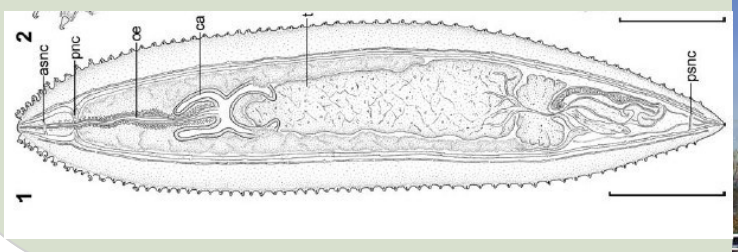
years at MTSU, Dr. Murphy served as the director of the Forensic Science Degree Program. Dr. Murphy's work at MTSU was not confined to academic administration and classroom teaching. He has published 16 articles in professional journals. His work appears in *Herpetologica,* the *Bulletin* of *Environmental Contamination, Transactions of the American Fisheries Society,* the *Journal* of *the Tennessee Academy* of *Science,* and in many others. He was a major supporter of student involvement in research. He served as thesis advisor to some 18 master's degree recipients and has supported the research of many other graduate degree candidates either as an informal advisor or as a thesis advisory committee member.

His expertise in the fields of zoology and university administration gave him many opportunities to serve as a professional resource person or as a consultant. He chaired the 1974 Tennessee Wildlife Resources Agency committee that developed the original list of threatened and endangered animal species in Tennessee. His professional consultancies were extensive and included completion of many biotic surveys and biological impact reports for the Tennessee Valley Authority, The Nature Conservancy, private engineering and law firms, and municipalities in Alabama, Kentucky, and Tennessee. He served as an evaluator of science programs at both the high school and collegiate levels for the Southern Association of Colleges and Schools (SACS) and participated in literally dozens of other service roles pertaining to education and government policy toward Tennessee biota.

An active professional, Dr. Murphy served in many leadership roles within the Association of Southeastern Biologists, Phi Kappa Phi, Sigma Xi, the Tennessee Education Association (TEA), and the Tennessee Academy of Science. Included among his leadership roles are terms as president of the Tennessee Academy of Science and the local chapters of Sigma Xi and TEA. Murphy's many contributions to the Tennessee Academy of Science were recognized in1987, when he was named a Fellow of that organization. He and other charter members of Phi Kappa Phi have been recognized for contributions to research and teaching. Other honors include receipt of a National Science Foundation Traineeship at Mississippi State University and election to numerous scientific and and learned societies.

In Memoriam: Dr. George Benz

Dr. George Benz passed away on February 10, 2015. Dr. Benz was a native of New Haven, CT and earned bachelor's and master's degrees at the University of Connecticut. He received his doctorate from the University of British Columbia. Before joining the faculty at MTSU in 2003, he was director of the Tennessee Aquarium Research Institute in Chattanooga, where he also served as chief research scientist. In 2006, Benz had the distinction of having a species named for him. The blood fluke, *Selachohemecus benzi* is only the second named blood fluke reported from a chondrichthyan in the Gulf of Mexico. The parasite was isolated from sharks captured between 1995 and 2004. Dr. Benz typically instructed the Marine Biology course and sections of the General Biology courses. In addition, he mentored several undergraduate and graduate student research projects.



Tropical Biology in Costa Rica!

Summer 2016 MTSU Education Abroad Faculty-Led program

YOU can spend 11 days in Costa Rica and earn three credit hours for BIOL 4330

PROGRAM DATES: May 18–June 3

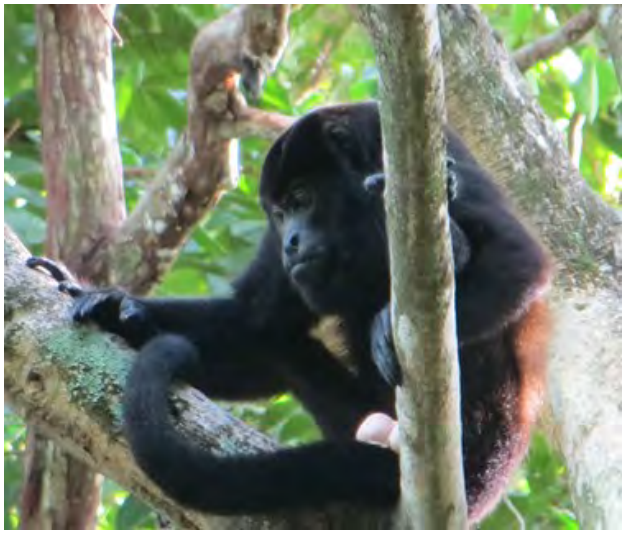
DATES IN COSTA RICA: May 24 June 3

Deadline:

Program Application: December 1, 2015 (with a $500 non-refundable deposit)
All students must be pre-approved online by the MTSU Office of Education Abroad (OEA) prior to program application submission. Contact: OEA | www.mtsu.edu/abroad

Program Fee: $1,750

This fee includes accommodations, most meals, and ground transportation. We will fly into San Jose and travel to the lowland tropical rainforest of La Selva Biological Station and then to the dry tropical forest of Montezuma on the Nicoya Peninsula. This fee does NOT include MTSU tuition (25% discount), international airfare, some meals, Education Abroad fee ($50), iNext insurance ($32), passport ($135), or personal expenses.



Students will participate in an 11-day excursion to Costa Rica! Here, they will explore La Selva Biological Station and Nicoya Penisula (includes Curu Wildlife Refuge, Cabo Blanco N.P., and island snorkeling). Diversity, natural history, and conservation will be highlighted. Apply early for the best chance of acceptance. Scholarships are available!

For Information about the program and application, contact Dr. Vincent Cobb (Vincent.Cobb@mtsu.edu) or Dr. Sarah Bergemann (Sarah.Bergemann@mtsu.edu).

Facebook: https://www.facebook.com/groups/784564148319311/

New Science Building Gets a Front Yard!

This past spring, the MTSU Photography Building, which was located in front of the new Science Building, was torn down. Demolition began in April and the site was completely cleared and grassed by the beginning of July. Following is a photo timeline of the process.

April 16, 2015

April 23, 2015

April 29, 2015

New Science Building Gets a Front Yard!

April 30, 2015

May 5, 2015

May 12, 2015

June 19, 2015

July 13, 2015

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 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 oz. 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		
			Drawstring backpack:	$5.00
Polo shirts	Short-Sleeve:	$25.00		
	Long-Sleeve:	$28.00	Coffee Mugs:	$3.00
Heather gray pull-over hoodie: (printed like T-shirts)		$25.00	Stadium Cups:	$1.00
			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-decuctible.

From the lab of

Lynn Boyd

The Boyd lab is thoroughly enjoying their space in the new Science Building. They are pleased to be sharing room 2011 with the **Nelson** lab. This facility is such a tremendous upgrade from previous facilities. Thus far in their new lab, there has only been one major flood (thank you Chemistry!)

The 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 "NSB project"). In April 2015, the lab was fortunate to be awarded an NIH grant to fund the sperm project. Plans are underway to apply to NSF for funding for the NSB project. Dr. Boyd has welcomed several new student researchers and a new research assistant. Below is a list of all lab members along with a brief statement about 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 NSB project: writing a paper is her "reward" for collecting so much data!

Jacob Sanders (M.S. student)–NSB project: thesis defense any day now!

Mason Riley (undergraduate Honors student)-NSB project: his results are the reason that we talk about *ubc-18* all the time.

Saraf Chowdhury (undergraduate Honors student)–NSB project: searching for NSBs in the intestine.

Archana Krishnamoorthy (research assistant)–sperm project: how many sperm can you isolate? Also creating new transgenic strains via microinjections

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

Anna Parnell (undergraduate student)–Is F52C6.12 a pseudogene?

Daniel Batie (undergraduate student)–making media for now, but we see great discoveries in his future!

Paola Molina, Katie Sampuda, Lynn Boyd, Jason Sanders, and Mason Riley.

The lab made a trip to Los Angeles this past summer to attend the International Worm Meeting. Three posters, lots of great science discussions, a little rubbing elbows with Nobel laureates, and a trip to the beach.

The Boyd lab is looking forward to an exciting year ahead. They are going to celebrate Katie's paper and Jacob's graduation, and hopefully many more research achievements. Please visit their web page or in person (http://capone.mtsu.edu/boydlab).

Katie Sampuda and Paola Molina with Nobel Laureate, Craig Mello.

From the lab of Andrew Brower

In March 2015, Dr. Brower was an instructor for a ten-day-long Lepidoptera field course in Bahia, Brazil. Members of the Brower lab recently published a paper in *Systematic Biology* addressing differential age estimates for a group of neotropical butterflies based on alternative sets of age calibrations. In addition, Master's student **Jennifer Benetti-Longhini** and Brower recently presented a poster at the Evolution meeting in São Paulo, Brazil. Dr. Brower also indicated that his ISI H-index just hit 30, a significant milestone.

From the lab of John DuBois

After joining the Tennessee Center for Botanical Medicine Research (TCBMR), Dr. DuBois' lab has been investigating the tissue culture of American Ginseng, *Panax quinquefolius*. To date, the members of his lab, **Shannon Smith** (MOBI Ph.D. candidate), **Matthew Fuller** (MSPS), **Jesse Werfel** (MSPS), **Aimee Wilson** (Honors undergraduate), and **Evidence Nwangwa** (Honors undergraduate) have been successful in culturing tissue callus of American Ginseng and now have the protocols to generate root and shoot tissue from the callus. They have a manuscript in review by the Tennessee Agricultural Extension Service for wild simulant production methods for American Ginseng farms in Tennessee.

This past summer, Dr. DuBois began a collaboration with Dr. Tony Johnston in Agribusiness/Agriscience investigating the propagation of the grape, *Vitis aestivalis* 'Norton/Cynthiana.' This cultivar of grape used in wine production, is native to the southeast United States and is a very hearty, pest and disease-tolerant grape. However, propagation of this cultivar has proven to be very difficult for vineyards. Ph.D. student **Shannon Smith** and Honors undergraduate **Aimee Wilson** have been able to get the grape successfully into tissue culture–something never before accomplished due to a fungal endophyte that complicates the process. They are finalizing the protocols and soon will be submitting a manuscript on the project. Honors undergraduate **Amanda Leachman** is investigating the seasonal differences in propagation success through stem cuttings as her honors thesis project. Her study will conclude at the end of summer 2016. Honors undergraduate **Evan Hunter** will soon be starting his thesis project investigating the isolation and characterization of the fungal endophyte.

From the lab of Mary & Anthony Farone

The Farone lab has been very busy during the past six months. The Farones had a paper recently accepted that describes a new species of the bacterium *Berkiella aquae*.

Former graduate student **Eric Vick** received his Ph.D. in December 2014, is currently at UTHSC Medical School, and has partnered with Chemistry graduate student **Matthew Wright** in a new biotech company, Salomon's House, LLC, that cultures endangered plants and then screens the cultured tissue for novel bioactive compounds. **Matthew Wright**, **Elliot Altman** and Tony Farone have received an NSF I-Corps grant of $50,000 to provide funding for the Salomon's House biotech start-up.

Elliot Altman, **Iris Gao**, and Tony have applied for a patent for the anti-cancer and anti-inflammatory properties of a compound from *Averrhoa carambola* L. Description of this compound is in press in *Oncotarget Journal*.

Current Ph.D. students **Erin Park** and **Raj Ghosh** have presented their work at two national meetings, The American Society of Pharmacognosy and The Phytochemical Society of North America, respectively.

Former M.S. student **Chad Brooks** is a Professor of Biology and Interim Dean of Allied Health Sciences at APSU.

The Farones' NSF TRIAD GK-12 is winding down after six years, and the 30 Graduate Fellows (GFs) that conducted their research while networking with biotech industry and mentoring research projects with high school students are now five Ph.D.s; three current Ph.D. students; 19 M.S. graduates (nine are currently in Ph.D.

(*continued on page 11*)

programs); seven science teachers; and two research technicians.

The GF-mentored high school students prepared over 400 presentations for local and regional science symposia and 25 exceptional projects were selected as papers for the Tennessee Junior Academy of Science.

The TRIAD program provided primarily Biology and Chemistry M.S. graduate students with a $30,000/year stipend, paid their tuition and fees, travel to present their thesis or dissertation research, and professional development. The GK-12 program also provided over $200,000 in support for six of the Molecular Bioscience Doctoral students. The last cohort of three M.S. students **Patrick Havlik**, **Jacob Sanders**, and **Andrew Trivette** have all begun their doctoral research this fall at University of North Carolina, University of Tennessee, and North Carolina State University, respectively. The Farones are excited that MTSU has agreed to fund a GK-12 sustainability program with two Cheatham STEM Graduate Fellows per year who will work with students and teachers at Central Magnet High School in Rutherford County.

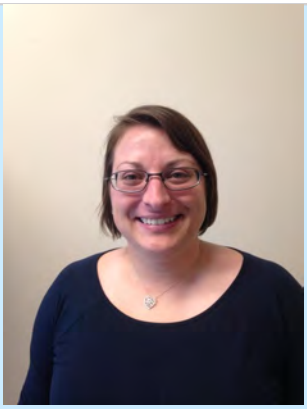
It has been a rewarding experience that the P.I.s (A. Farone, M. Farone, and **K. Sadler**) could not have done without the help of: former Dean of the College of Basic and Applied Science Tom Cheatham, current MTSU STEM Director; the evaluator, Dr. Ginger Rowell, MTSU Mathematics; Master Teacher, Jennifer Dye, JP2HS; their communications guru and now program officer at NSF, Dr. Rick Tankersley; their friends in Chile and Puerto Rico; their data collection website administrator, Vince Hardy at Texas A&M University; and their coordinator, Karen Case, who has retired to Delaware to be close to her granddaughter and to relax.

Recent Publications:

Mehari Y, Hayes J, Redding K, Mariappan P, Gunderson J, Farone A, Farone M. 2015. *Berkiella aquae* gen. nov., sp. nov., and *Berkiella cookevillensis* sp. nov., intranuclear bacteria isolated from freshwater amoebae. *IJSEM.* In press.

Gao Y, Huang R, Gong Y, Park HS, Wen Q, Almosnid N, Uma D, Chippada-Venkata UD, Hosain N, Vick E, Farone A, Altman E. 2015. The antidiabetic compound 2-dodecyl-6-methoxycyclohexa-2,5-diene-1,4-dione, isolated from *Averrhoa carambola* L., demonstrates significant antitumor potential against human breast cancer cells. *Oncotarget Journal*. *In press*.

From the lab of Alicja Lanfear



Dr. Lanfear, lecturer in the Biology Department, continues to share her knowledge and further develop as a science educator. She is interested in reaching non-formal education audiences and is working as a Co-P.I. with **Cindi Smith Walters** (P.I., Biology), **Kim Sadler** (Co-P.I., Biology), Preston MacDougall (Co-P.I., Chemistry), and Tom Cheatham to submit a NSF AISL grant proposal in November that will evaluate and provide recommendations for fourth and fifth grade programs offered at Murfeesboro's Discovery Center. Alicja is also presenting two of her education research projects, completed in collaboration with graduate M.S.E. Biology students **Angelique Troelstrup** and **Velta Napoleon-Fanis** and **Cindi Smith-Walters** at the November meeting of the Tennessee Academy of Science, to be held at MTSU. Recently, Alicja was accepted into the Human Anatomy and Physiology Society's HAPS Educator committee, where she will serve as a reviewer for HAPS' quarterly, international, peer-reviewed journal in Human Anatomy and Physiology Education.

On campus, Alicja was awarded the Learning, Teaching, and Innovative Technology Center's designation of Faculty Fellow for 2015-2016. She also serves on the Information Literacy Faculty Advisory Committee. The purpose of this interdisciplinary advisory group is to offer Walker Library's instruction librarians a non-library faculty perspective on undergraduate research and writing, library instruction, and information literacy. Last year Alicja participated in the Information Literacy Faculty Learning Committee, which proposed an Information Literacy Curriculum Integration grant.

From the lab of Kim Sadler

Take a walking tour of the campus using the pamphlet titled *An MTSU Sampler of Native Tennessee Trees,* and enjoy views of 35 native Tennessee trees (plus one unique introduced species, a male and female Ginkgo). The pamphlet unfolds to the campus map annotated with locations of trees while another part of the pamphlet

(*continued on page 12*)

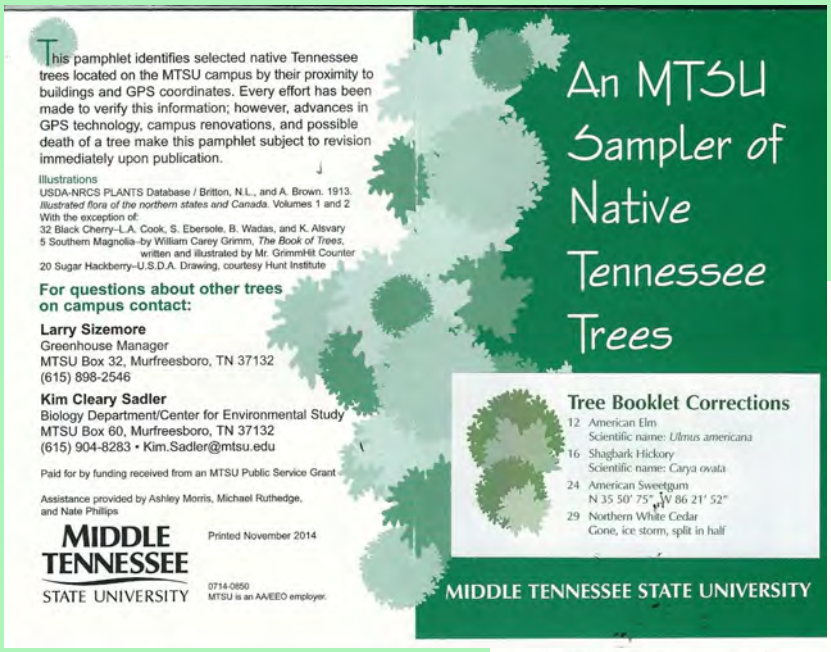
provides tree details that include common and scientific names, GPS coordinates, and historical remarks. Copies of the pamphlet can be obtained at the Department of Biology office, MT One Stop, or the Student Union Information Desk.

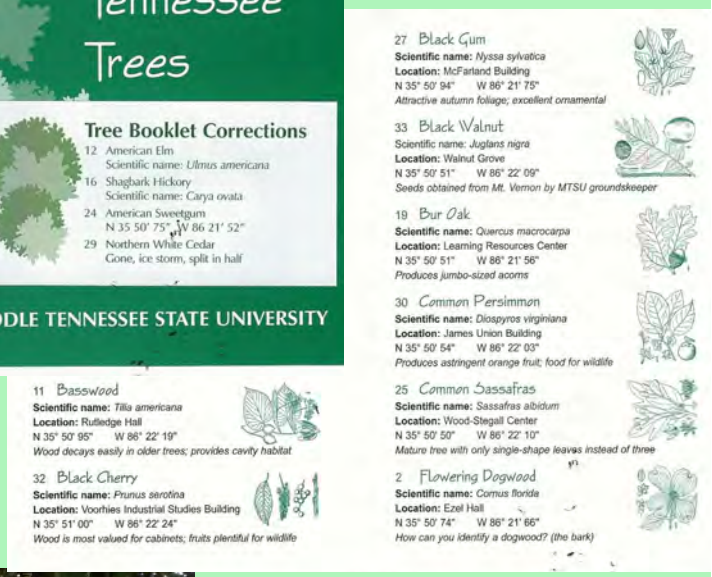
It is hoped those who take the walking tour using the tree pamphlet will also notice the diverse range of trees both native and non-native, newly-planted, and mature, that dot the beautiful more-than-a-century-old campus. These trees are not only viewed by the public, and make a lasting impression of our University on prospective students and visitors, but they are also used as part of the educational curriculum utilized by MTSU Biology and Plant Science classes.

Records exist of the landscaping on campus dating from the 1960's to the present. Prior to the 1960's not much is known about the landscaping on campus. As a result, we don't know when some of the older trees on campus were planted. For example, the planting of the 'Mount Vernon Walnut Trees' in MTSU's Walnut Grove is the only planting that occurred prior to 1960 that is recorded. The seeds were brought from Mount Vernon by Harry Belcher and planted at MTSU.

Of interest to visitors may be some of the older trees on campus. Examples include the Southern Magnolias by the Tom Jackson Building and the Shingle Oak and the Common Persimmon in the JUB and Rutledge Hall areas. Examples of rare trees include the American Elm at Abernathy/Alumni Drive, the September Elm near the Kennon Hall of Fame area, and the Underwood Hican (a cross between a hickory and pecan) and the Shinerling Shagbark Hickory by McFarland.

Trees included in *An MTSU Sampler of Native Tennessee Trees* have also been labeled with a 2 x 3-inch black and white plaque. Work on the pamphlet was a collaborative effort between Larry Sizemore, Kim Sadler, **Michael Rutledge**, **Ashley Morris**, and Nate Phillips (Agriscience). Printing costs and tree labels were paid for by an MTSU Public Service Grant.





Pin Oak in the Science Building Courtyard Area

2015-2016 Graduate Teaching Assistants

For the 2015-2016 academic year, the department is providing support to 26 M.S.-level and 18 Ph.D.-level graduate students who serve as graduate teaching assistants (GTAs). Nineteen of these students have received undergraduate degrees from colleges and universities other than MTSU. Sixteen hold baccalaureate degrees in subjects other than biology (anthropology, biochemistry, biomedical engineering, biotechnology, botany, chemistry, construction science, environmental science, history, microbiology, plant and soil science, psychology). Three of these a ssistants 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

JK Ridma Bandara, B.S., Chemistry and Botany, 2010, University of Peradeniya, Sri Lanka

Richard Bautista, B.S., Biochemistry, 2015, Middle Tennessee State University

Jesse Chambers, B.S., Biology, 2014, Middle Tennessee State University

Sade Dunn, B.S. Biology, 2010, Middle Tennessee State University

Erin Floyd, B.S., Anthropology, 2014, Middle Tennessee State University

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

Alexis Gross, B.S., Biology, 2013, Middle Tennessee State University

James Hayes, B.S., Biomedical Engineering, 2012, University of Tennessee Knoxville

Amber Hills, B.S., Environmental Biology, 2012, Tennessee Technological University

Bryce Kerr, B.S., Biology, 2015, Appalachian State University

Opal Leonard, B.S., Biochemistry, 2013, Middle Tennessee State University

Eric Limbird, B.S., Plant and Soil Science, 2013, Middle Tennessee State University

Louise McCallie, B.S., Biology, 2015, Lehigh University

Spencer McDaniel, B.S., Biology, 2014, 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

Kevin Trostel, B.S., Plant and Soil Science, 2013, Middle Tennessee State University

(*continued on page 14*)

2015-2016 Graduate Teaching Assistants

Ph.D. GRADUATE TEACHING ASSISTANTS

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

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

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

Rajarshi Ghosh, B.S.T., Biotechnology, 2011, West Bengal University, M.S., Biology, 2014 University of West Florida

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

Terry Hopkins, B.S., Construction Science, 1996, University of Central Missouri, B.S., Wildlife Sciences, 2007 Tennessee Technological University, M.S., Biology, 2013, Austin Peay State University

Mary Ellen Lohr, B.S., Biology, 2001 Western Kentucky University, M.S., Biology, 2012, Western Kentucky 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

David Owens, B.S., Biology, 2002, Middle Tennessee State University, M.S., Aquatic Ecology, 2010 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

Megan Stallard, B.S., Biology, 1999, Tennessee Tech University, M.S., Toxicology, 2005 Texas A&M College Station

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

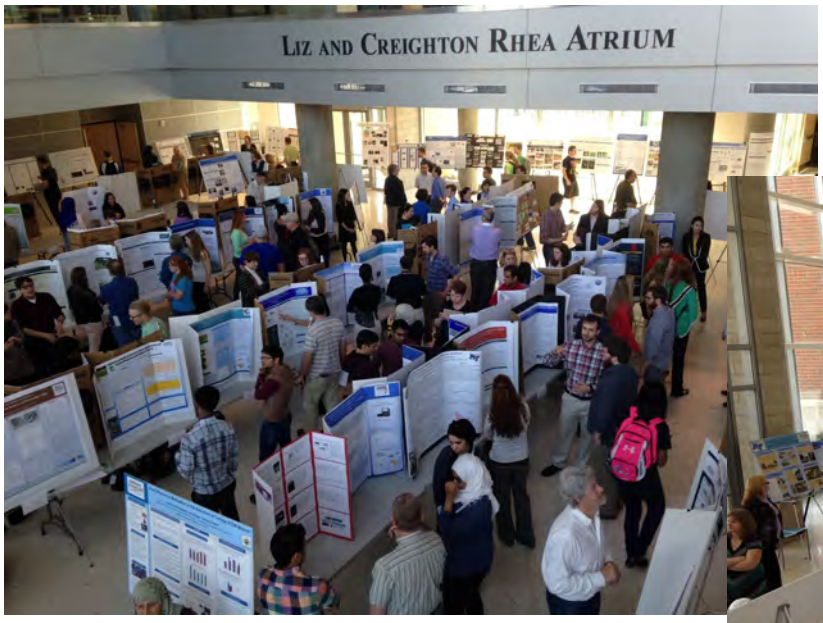
Angelique Troelstrup, B.S., Psychology, 2000, Middle Tennessee State University, M.S., Quantitative Psychology, 2003 Middle Tennessee State University

Scholars Week: Posters in the Atrium

Middle Tennessee State University held its annual Scholars Week March 16-20, 2014. The College of Basic and Applied Sciences held a poster session on Thursday, March 19, 2015 in the Science Building Atrium.

The department was well-represented with 30 posters. Authors of these posters included 21 faculty members, 25 graduate students, and 31 undergraduate students.

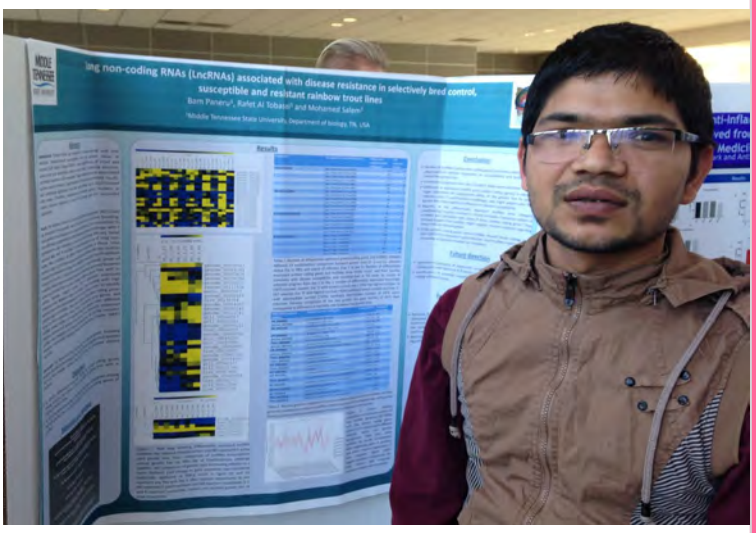
Faculty members involved in mentoring these students deserve credit for their effort and expertise in these research projects. The poster session was well attended by the University community. Many people from across campus saw the quality of research being conducted in the department. Congratulations to all authors for a job well done!



Posters in the Atrium cont.

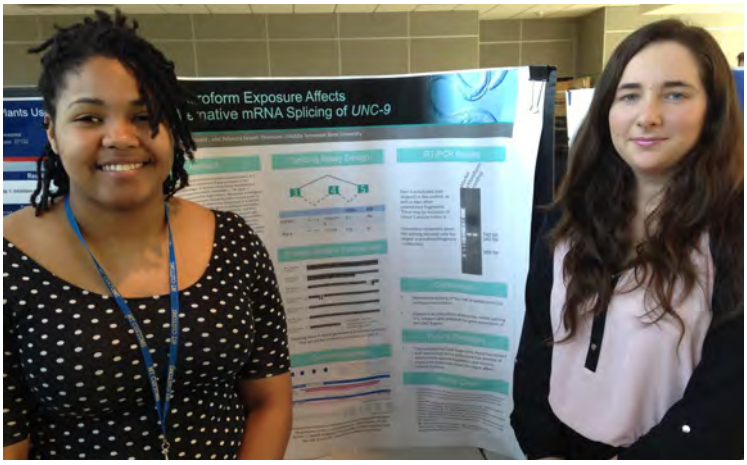
Drew Sieg, **Kim Sadler** presented "Implementing Authentic Research Experiences into Honors Freshman Biology Courses through the Small World Initiative."

Bam Paneru, **Rafet Tobasei**, **Mohamed Salem** (faculty) presented "Long Non-coding RNAs (LncRNAs) Associated with Disease Resistance in Selectively Bred Control, Susceptible and Resistant Rainbow Trout Lines."



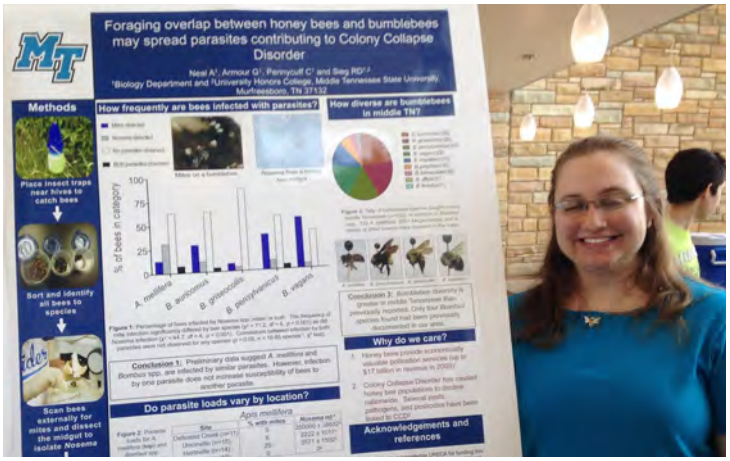
Jesse Chambers, Mohamed Salem (faculty) presented "DNA Methylome Analysis in Improved Rainbow Trout Broodstocks for Resistance to Diseases and Fast Growth: a Plan of Study."

Erin Herbstova, **Destiny Donald**, **Rebecca Seipelt-Thiemann** (faculty) presented "Chloroform Exposure Affects Alternative mRNA Splicing of UNC-9."

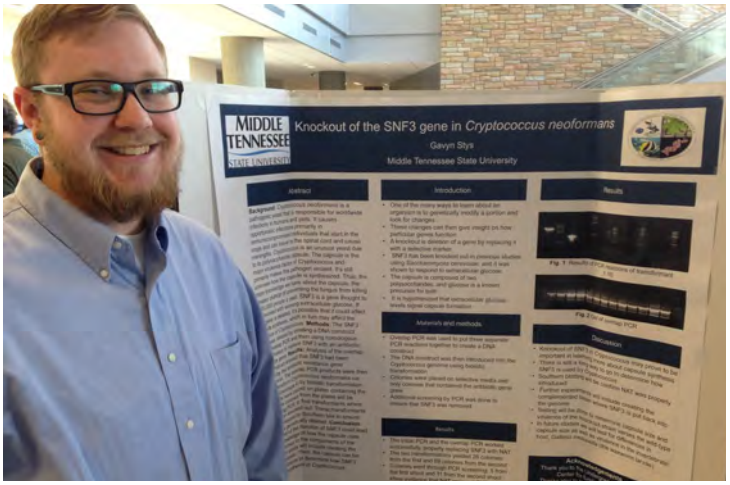


Jeffery Bonner (Mathematics and Science Education), **Grant Gardner** (faculty) presented "Linking Students' Understanding of Microbiology Concepts with more Expert-like Views about Biology."

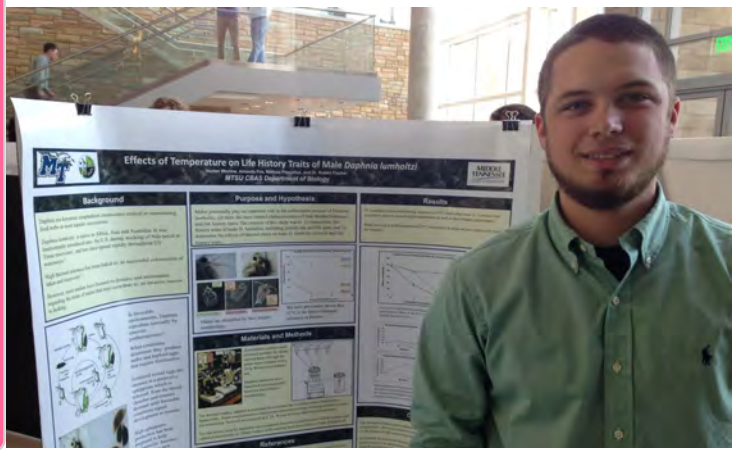
Anna Neal, **G. Armour**, **C. Pennycuff**, **Robert Sieg** (faculty) presented "Foraging Overlap between Honey Bees and Bumble Bees may Spread Parasites Contributing to Colony Collapse Disorder."



Gavyn Stys, **Erin McClelland** (faculty) presented "Knockout of the SNF3 Gene in *Cryptococcus neoformans*."

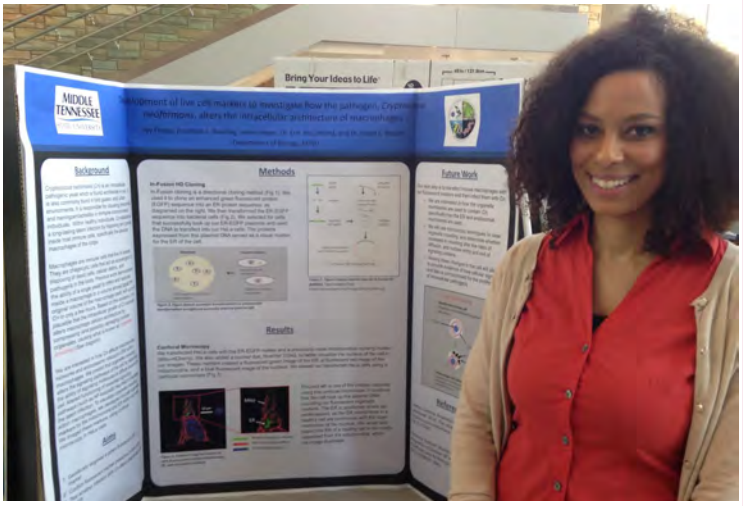


Hunter Morrow, **Amanda Fox**, **Melissa Pompilius** (graduate student), **Robert Fischer** (faculty) presented "Effects of Temperature on Life History Traits of Male *Daphnia lumholtzi*."



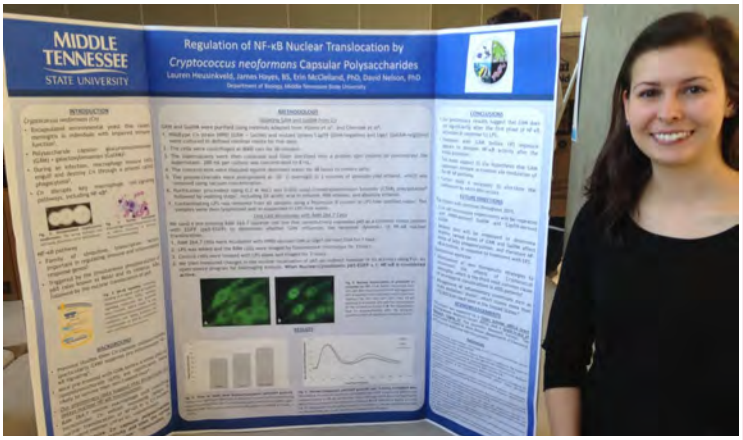
Posters in the Atrium cont.

Joy Fihosy, **Jonathan Bowling** (graduate student), **James Hayes** (graduate student), **Erin McClelland**, (faculty), **David Nelson** (faculty) presented "Development of Live Cell Markers to Investigate how the Pathogen, *Cryptococcus neoformans*, Alters the Intracellular Architecture of Macrophages."

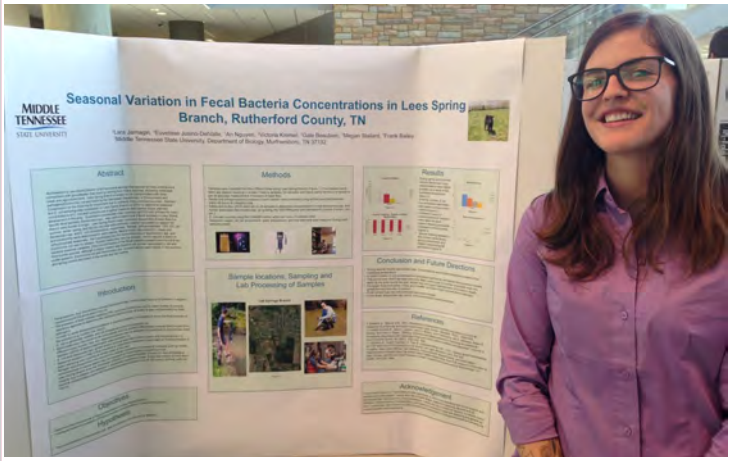


Larissa Wolf, **Jonathan Bowling** (graduate student), **David Nelson** (faculty) presented "Determining the Effect of Neuroinflammation on Mitochondrial Quality Control in Parkinson's Disease."

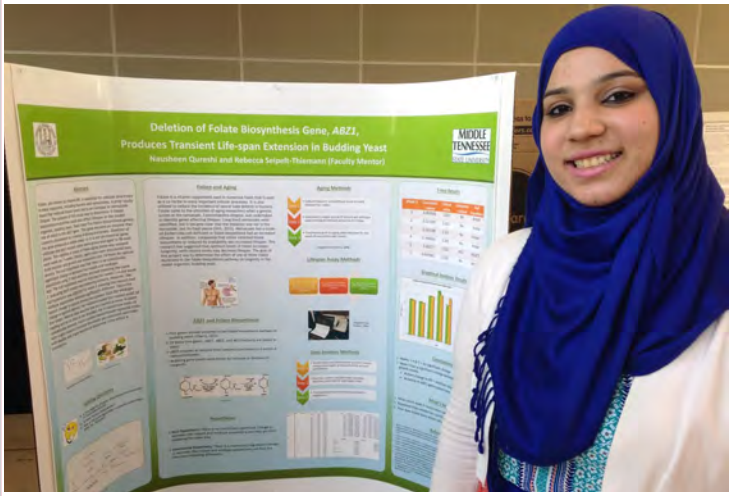
Lauren Heusinkveld, **James Hayes** (graduate student), **David Nelson** (faculty), **Erin McClelland** (faculty) presented "Regulation of NF-κB Nuclear Translocation by *Cryptococcus neoformans* Capsular Polysaccharides."



Lara Jarnagin, **Euvelisse Jusino-DelValle**, **An Nguyen**, **Victoria Kremer** (graduate student), **Gale Beaubien** (graduate student), **Megan Stallard** (graduate student), **Frank Bailey** (faculty) presented "Seasonal Variation in Fecal Bacteria Concentrations Lees Spring Branch, Rutherford County, TN."



Nausheen Qureshi, **Rebecca Seipelt-Thiemann** (faculty) presented "Deletion of Folate Biosynthesis Gene, ABZ1, Produces Transient Life-Span Extension in Budding Yeast."



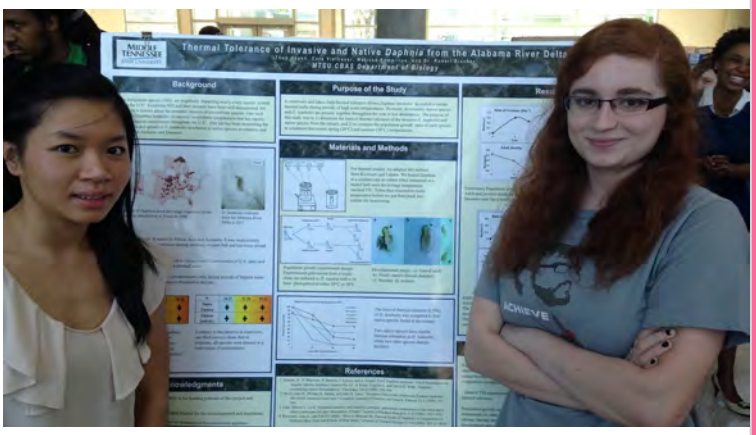
Mike Rhoades, **Anthony Mims**, **Kathryn Briggs**, **Steve Howard** (faculty) presented "Soil Depth as a Determinant of Plant Species Richness on Cedar Glades in Middle Tennessee."

Caleb Sutton, **Mary Farone** (faculty) presented "A Modern Approach to Traditional Medicine: Screening, Biofilms, and Mechanism of Action in *Candida albicans*."

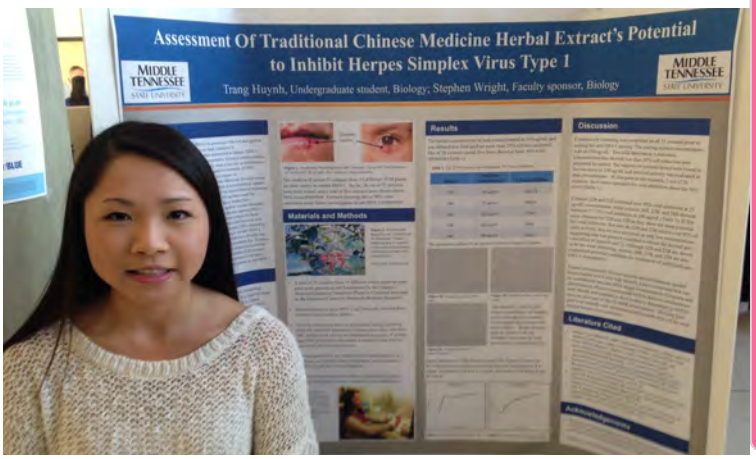
Posters in the Atrium cont.

Katie Press, **Jeff Leblond** (faculty) presented "Mono and Diglactosyldiacylglycerol Composition of Brown Algae Genus Sphacelaria: a Modern Interpretation using Position-Ion Electrospray/Mass Spectrometry."

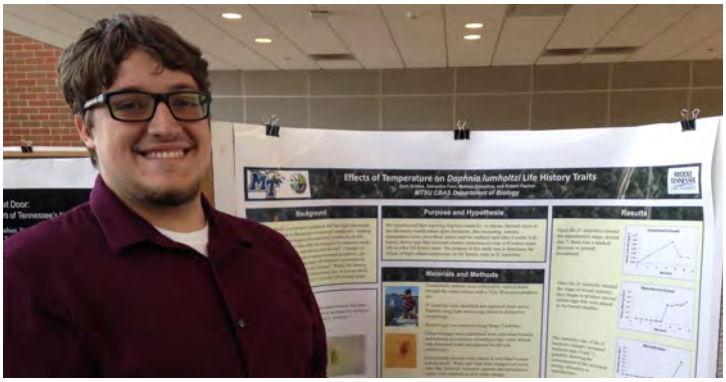
Thuy Huynh, **Cara Vielhauer**, **Melissa Pompilius** (graduate student), **Robert Fischer** (faculty) presented "Thermal Tolerance of Invasive and Native *Daphnia* from the Alabama River Delta."



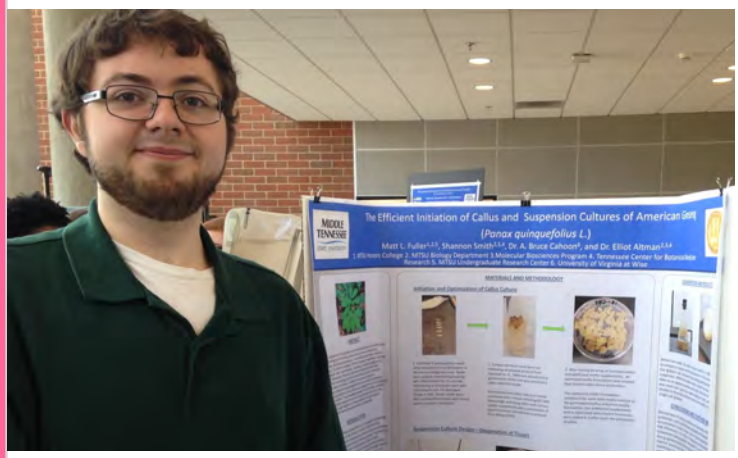
Trang Huynh, **Stephen Wright** (faculty) presented "Assessment Of Traditional Chinese Medicine Herbal Extract's Potential to Inhibit Herpes Simplex Virus Type 1."



Zach Grimes, **Samantha Fann**, **Melissa Pompilius** (graduate student), **Robert Fischer** (faculty) presented "Effects of Temperature on *Daphnia Lumholtzi* Life History Traits."



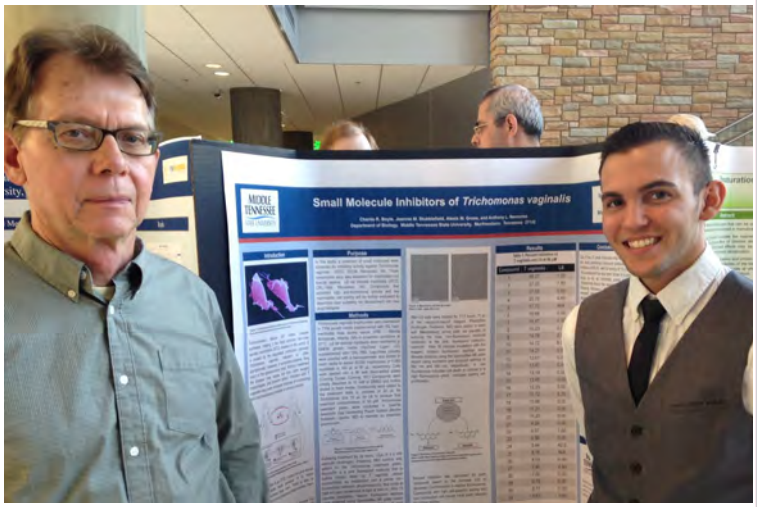
Matt Fuller, **Shannon Smith**, **Bruce Cahoon**, **Elliot Altman** (faculty) presented "The Efficient Initiation of Callus and Suspension Cultures of American Ginseng (*Panax quiquefolius* L)."



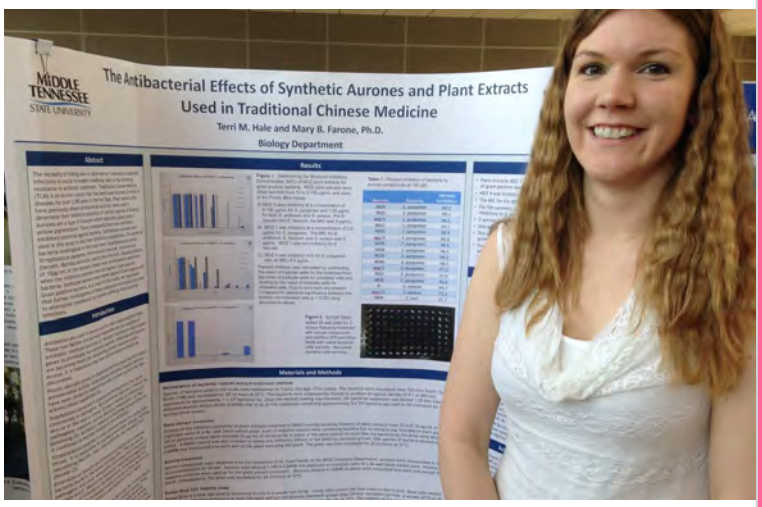
Leigh Gardner, **Gale Beaudien**, **Brian Miller** (faculty) presented "Strangers Next Door: Finding the Streamside Salamanders of Tennessee's Natural Areas."

Posters in the Atrium cont.

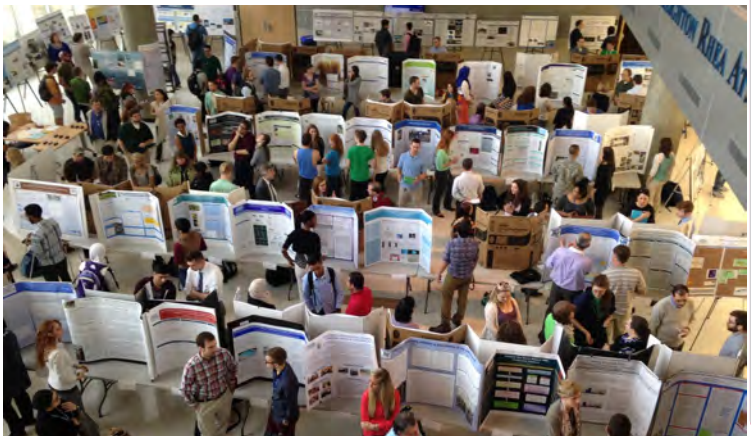
Charlie Boyle, **Jeannie Stubblefield**, **Alexis Gross**, **Anthony Newsome** (faculty) presented "Small Molecule Inhibition of *Trichomonas vaginalis*."



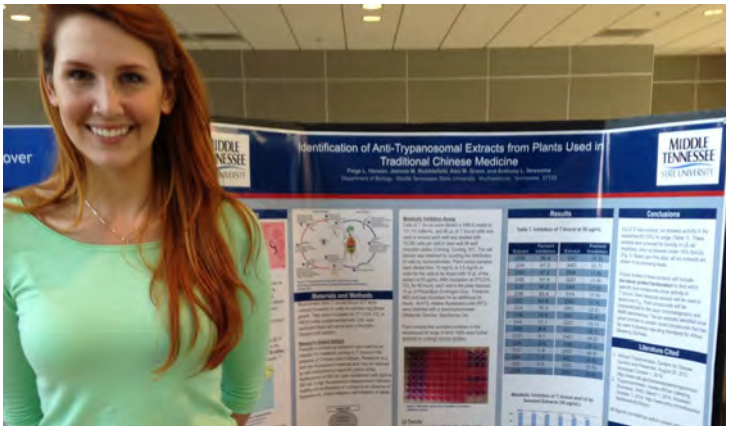
Terri Hale, **Mary Farone** (faculty) presented "The Antibacterial Effects of Synthetic Aurones and Plant Extracts Used in Traditional Chinese Medicine."



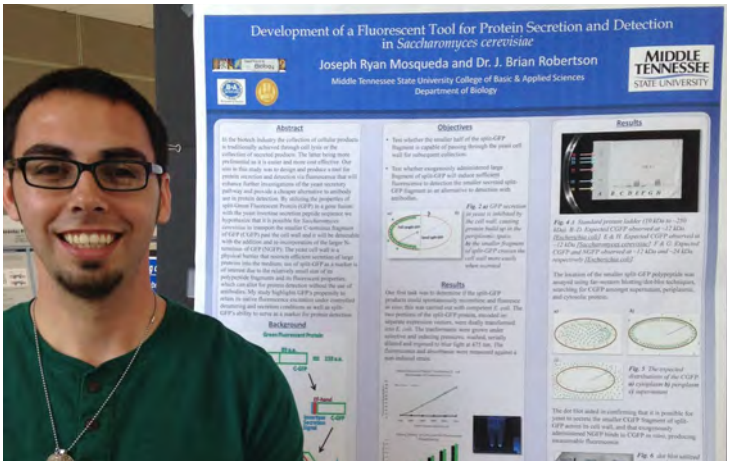
David Owens, **Cindi Smith-Walters** (faculty) presented "Enhancing Academic Achievement, Nature Appreciation and Activity through the Junior Rangers Program."



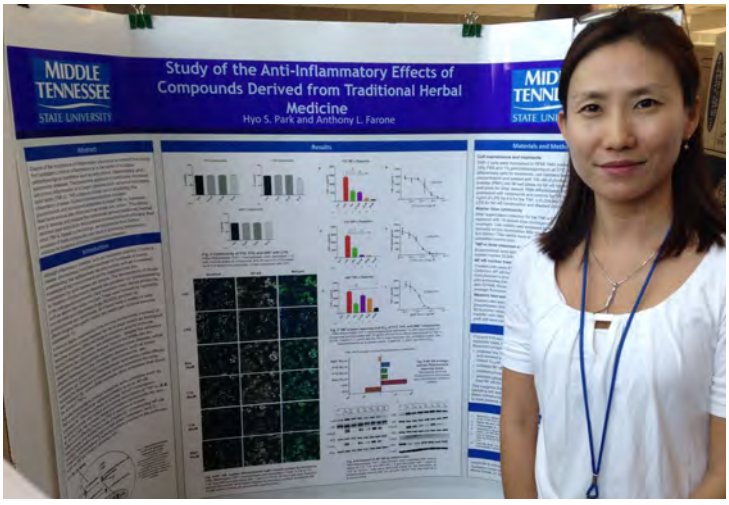
Paige Hansen, **Jeannie Stubblefield**, **Alex Gross**, **Anthony Newsome** (faculty) presented "Indentification of Anti-*Trypanosomal* Extracts from Plants used in Traditional Chinese Medicine."



Joseph Mosqueda, Brian Robertson (faculty) presented "Development of a Fluorescent Tool for Protein Secretion and Detection in *Saccharomyces cerevisiae*."



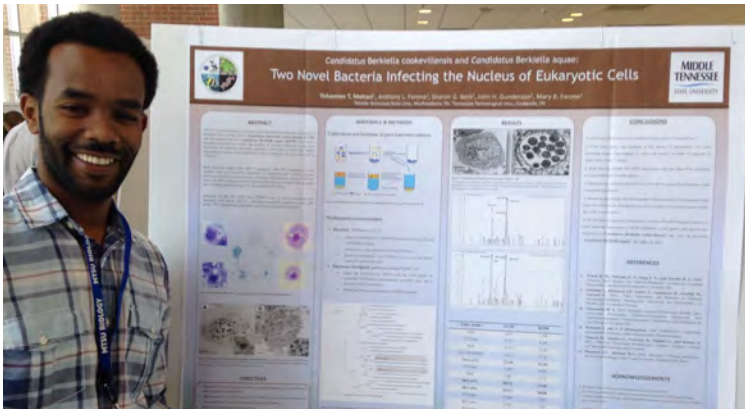
Hyo Park, **Anthony Farone** (faculty) presented "Study of the Anti-Inflammatory Effects of Compounds Derived from Traditional Herbal Medicine."

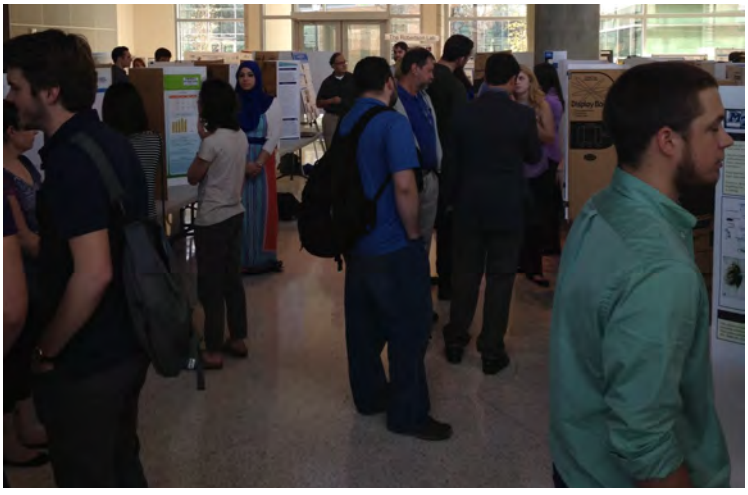


Posters in the Atrium cont.

Jacob Sanders, **Patrick Havlik**, **Andrew Trivette**, **Kim Sadler** (faculty), **Mary Farone** (faculty), **Anthony Farone** (faculty), **David Nelson** (faculty), **Heather Corban**, Pam Stewart, Tamela Hunt presented "Teaching, Research, and Industry Partnerships to Deepen Scientific Understanding in Middle Tennessee."

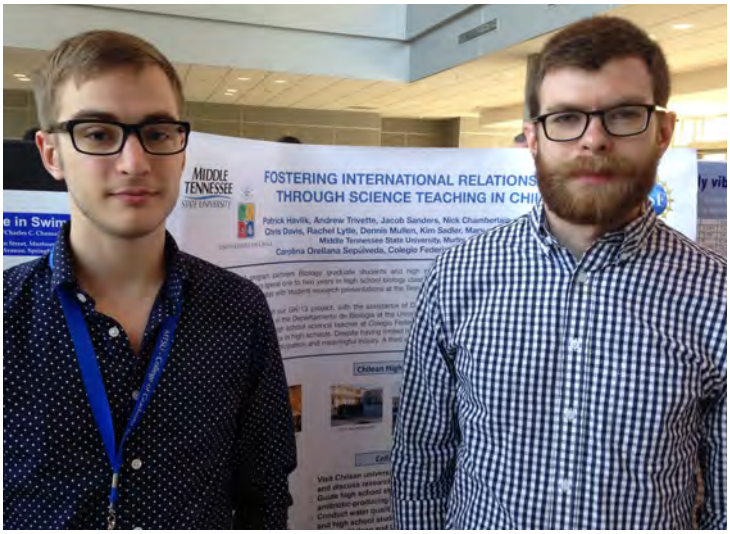
Yohannes Mehari, **Anthony Farone** (faculty), Sharon Berk, John Gunderson, **Mary Farone** (faculty) presented "Two Novel Bacteria Infecting the Nucleus of Eukaryotic Cells."





Martina Ramos, **Erin McClelland** (faculty) presented "Reconstitution of pro1 in *Cryptococcus neoformans*."

Patrick Havlik, **Andrew Trivette**, **Jacob Sanders**, **Nick Chamberlain**, **Paola Molina**, **Chris Davis**, **Rachel Lytle**, **Dennis Mullen** (faculty), **Kim Sadler** (faculty), **Mary Farone** (faculty), Anthony Farone (faculty), Carolina Sepulveda presented "Fostering International Relationships through Science Teaching in Chile."



Scholars Week Highlights Faculty and Student Research

Middle Tennessee State University held its annual Scholars Week March 16-20, 2015. The department presented 39 posters. Authors of these posters included 20 faculty members, 16 graduate students, and 54 undergraduate students.

Awards were given to the top three posters presented by graduate students and undergraduate students from each college. Seven posters from the Department of Biology took home awards. The posters by Anna Neal, Joy Fihosy and Trang Huynh all tied for first place in the undergraduate student division. The posters by Bam Paneru and Katherine Stefanski tied for first place in the graduate student division. The poster by Logan Bowling tied for second place in the graduate student division. The poster by Rachel Lytle tied for third place in the graduate student division. Biology posters accounted for seven of the 13 awards given to the College of Basic and Applied Sciences.

Faculty members involved in mentoring these students deserve credit for their time, effort and expertise in these research projects. Many people from across campus saw the quality of research being conducted in the department. Congratulations to all authors for a job well done!

To see the entire Scholars Week program and abstracts from all posters and presentations, visit http://www.mtsu.edu/research/scholarsWeek/. Posters from the Department of Biology are given below.

Faculty Presentations

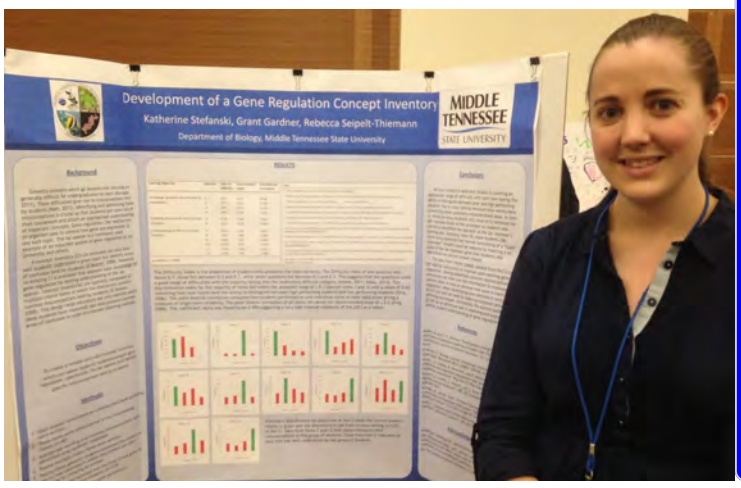
Drew Sieg, **Kim Sadler** presented "Implementing Authentic Research Experiences into Honors Freshmen Biology Courses through the Small World Initiative."

Graduate Student Presentations

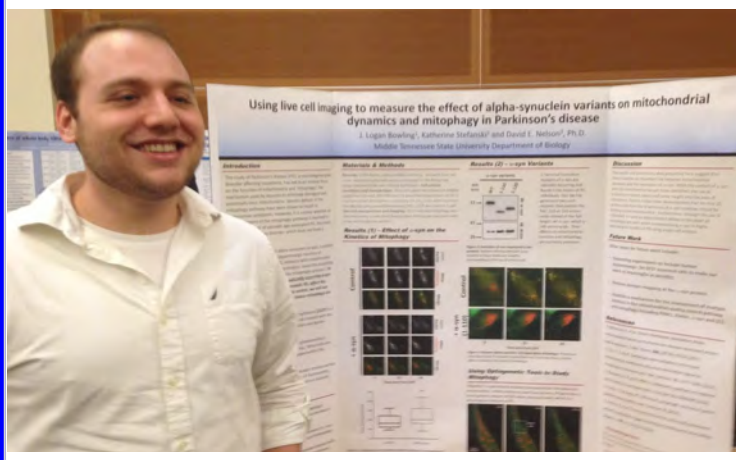
Ali Ali, **Bam Paneru**, **Rafet Al Tobasei**, **Mohamed Salem** (faculty) presented "Identification of Single Nucleotide Polymorphism (SNP) Markers for Muscle Yield and Quality in Rainbow Trout Using RNA Seq."

Kourtney Kizer, **Erin McClelland** (faculty) presented "The Role of the RTAL Gene in the Pathogenicity of *Cryptococcus neoformans*."

Katherine Stefanski, **Grant Gardner** (faculty), **Rebecca Seipelt-Thiemann** (faculty) presented "Development of a Gene Regulation Concept Inventory."



Logan Bowling, **Katherine Stefanski**, **David Nelson** (faculty) presented "Using Live Cell Imaging to Measure the Effect of Alpha-Synuclein Variants on Mitochondrial Dynamics and Mitophagy in Parkinson's Disease."



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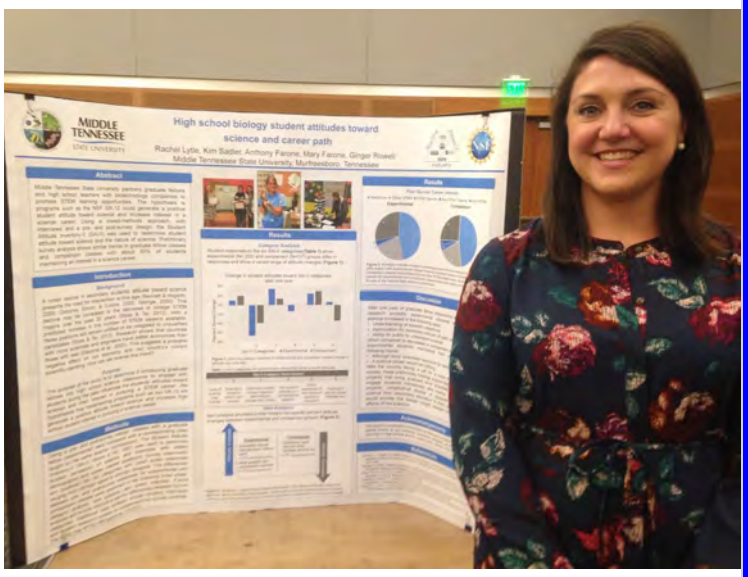
Jesse Chambers, Mohamed Salem (faculty) presented "DNA Methylome Analysis in Improved Rainbow Trout Broodstocks for Resistance to Diseases and Fast Growth: a Plan of Study."

Jeffery Bonner (Mathematics and Science Education), **Grant Gardner** (faculty) presented "Linking Students' Understanding of Microbiology Concepts with more Expert-like Views about Biology."

Scholars Week cont.

Rafet Al-Tobasei, **Bam Paneru**, **Mohamed Salem** (faculty) presented "Genome-Wide Discovery of Long Non-Coding RNAs in Rainbow Trout and Their Potential Roles in Muscle Growth and Quality."

Rachel Lytle, **Kim Sadler** (faculty), **Anthony Farone** (faculty), **Mary Farone** (faculty), Ginger Rowell (faculty, Mathematics) presented "High School Biology Student Attitudes Toward Science and Career Path."



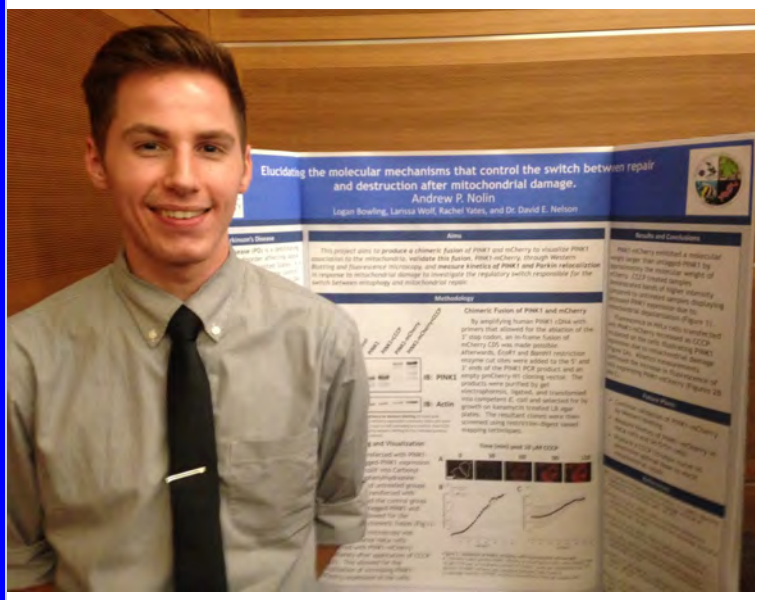
Amber Hills, Susan Lanier (government agency collaborator), David McKinney (government agency collaborator), **Ryan Otter** (faculty) presented "Individual Life History Analysis of Three Mussel Species: Implications for a Mussel Health Index."

Undergraduate Student Presentations

Anna Neal, **G. Armour**, **C. Pennycuff**, **Robert Sieg** (faculty) presented "Foraging Overlap between Honey Bees and Bumble Bees may Spread Parasites Contributing to Colony Collapse Disorder."

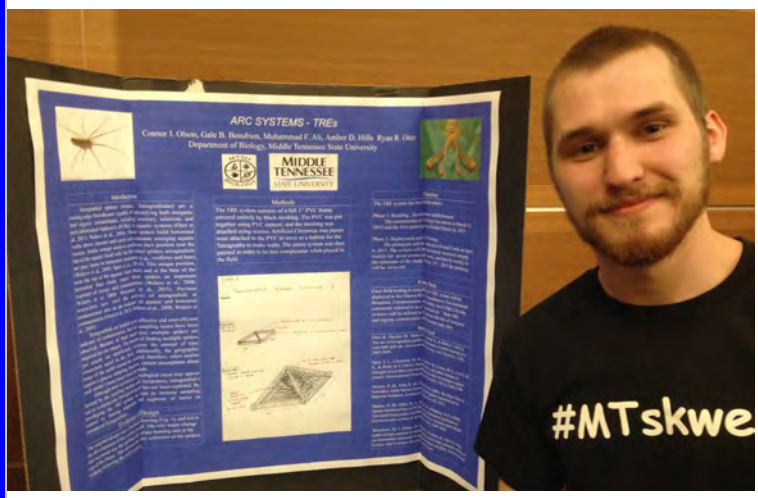
Christopher Adereti, **Justice Adewumi**, Arol Zague (Chemistry), **Brittnie Miles**, Daria Covington (Chemistry), **Keidra Freshwater**, **Caleb Walls**, **James DuPois**, **Joel Lowry**, **Tianna Grant**, **Nicole Walker, Joey Clifton, Josie Lyon**, **Bryan Overbey**, **Charlie Brown**, **Rance Solomon**, **Ying Gao** (faculty), **Daniel Erenso** (faculty) presented "The Effect of Herbal Extract Used in Traditional Chinese Medicine on Breast Cancer Cells."

Andrew Nolin, **Logan Bowling** (graduate student), **Larissa Wolf**, **Rachel Yates**, **David Nelson** (faculty) presented "Elucidating the Molecular Mechanisms that Control the Switch between Repair and Destruction after Mitochondrial Damage."



Brooke Morgan, **Alicja Lanfear** (faculty) presented "MIX13: A NIST Interlaboratory Study on the Present State of DNA Mixture Interpretation."

Connor Olson, **Gale Beaubien** (graduate student), **Mohammad Ali**, **Amber Hills**, **Ryan Otter** (faculty) presented "ARC Systems-TREs."



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Scholars Week cont.

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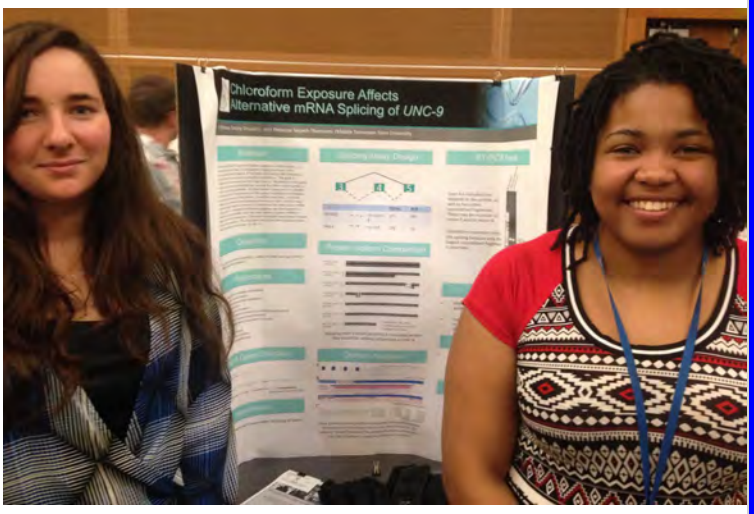

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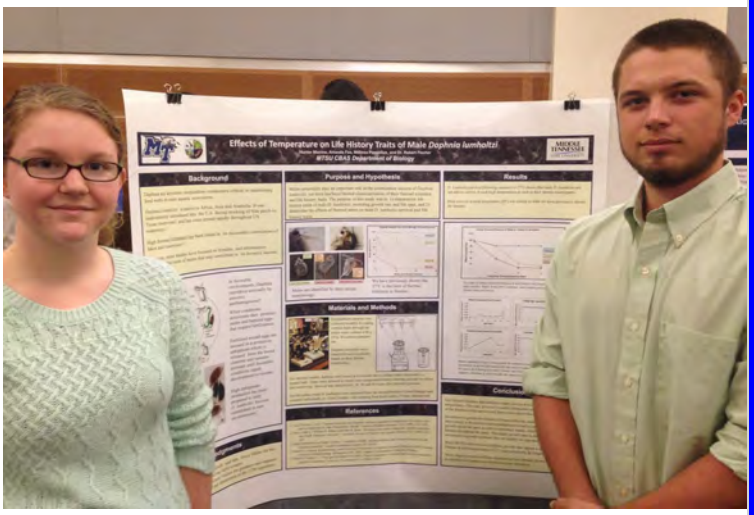
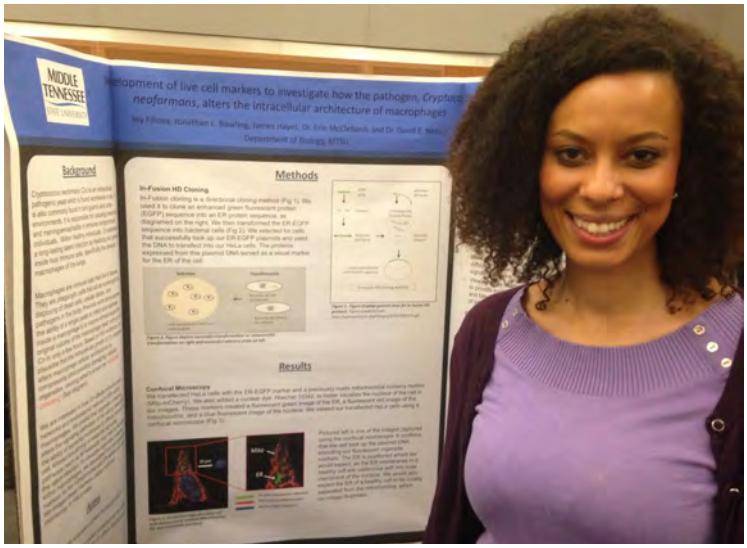


Kathryn Brittain, **Erin McClelland** (faculty) presented "What does BCAT do in *Cryptococcus neoformans*?"

Larissa Wolf, **Jonathan Bowling** (graduate student), **David Nelson** (faculty) presented "Determining the Effect of Neuroinflammation on Mitochondrial Quality Control in Parkinson's Disease."

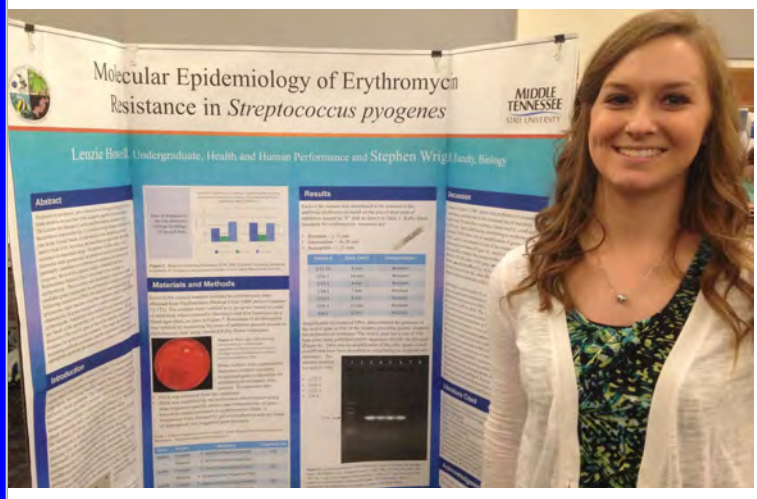
Lauren Heusinkveld, **James Hayes** (graduate student), **David Nelson** (faculty), **Erin McClelland** (faculty) presented "Regulation of NF-κB Nuclear Translocation by *Cryptococcus neoformans* Capsular Polysaccharides."

Joy Fihosy, **Jonathan Bowling** (graduate student), **James Hayes** (graduate student), **Erin McClelland**, (faculty), **David Nelson** (faculty) presented Development of Live Cell Markers to Investigate how the Pathogen, *Cryptococcus neoformans*, Alters the Intracellular Architecture of Macrophages."



Lara Jarnagin, **Euvelisse Jusino-DelValle**, **An Nguyen**, **Victoria Kremer** (graduate student), **Gale Beaubien** (graduate student), **Megan Stallard** (graduate student), **Frank Bailey** (faculty) presented "Seasonal Variation in Fecal Bacteria Concentrations Lees Spring Branch, Rutherford County, TN."

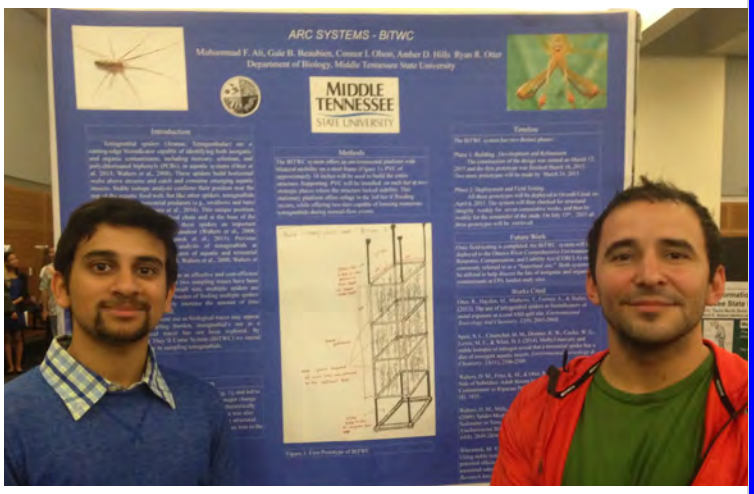
Lenzie Howell (Health and Human Performance), **Stephen Wright** (faculty) presented "Molecular Epidemiology of Erythromycin Resistance in *Streptococcus pyogenes*."



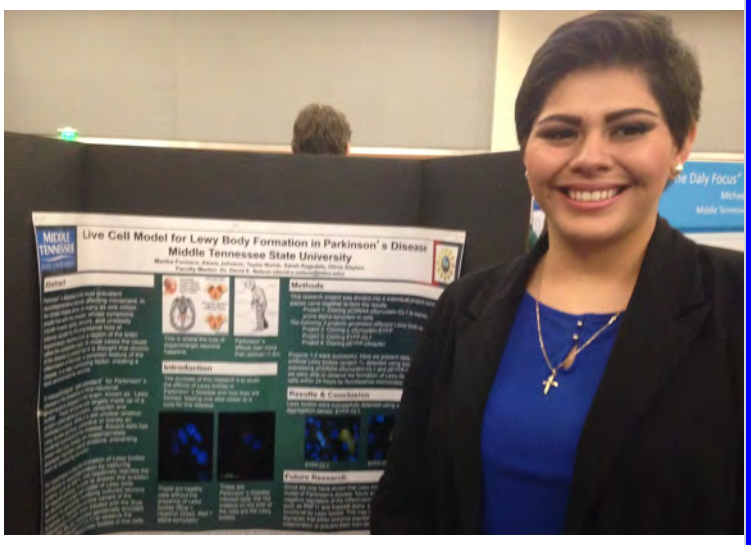
Martina Ramos, **Erin McClelland** (faculty) presented "Reconstitution of pro1 in *Cryptococcus neoformans*."

Scholars Week cont.

Muhammad Ali, **Gale Beaubian** (graduate student), **Connor Olson**, **Amber Hills**, **Ryan Otter** (faculty) presented "ARC Systems–BiTWC."



Martha Fonseca (Chemistry), **Alexis Johnson**, **Taylor Norris**, **Sarah Ragsdale**, **Olivia Slayton**, **David Nelson** (faculty) presented "Live Cell Model for Lewy Body Formation in Parkinson's Disease."

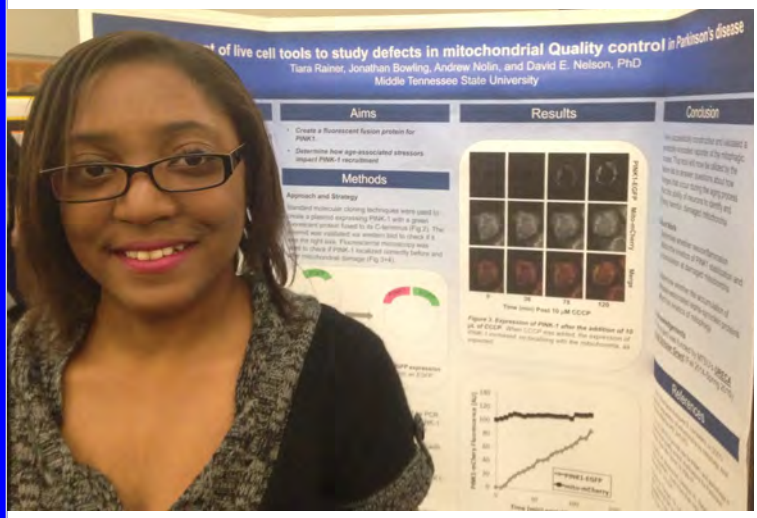


Nausheen Qureshi, **Rebecca Seipelt-Thiemann** (faculty) presented "Deletion of Folate Biosynthesis Gene, ABZ1, Produces Transient Life-Span Extension in Budding Yeast."

Katie Press, **Jeff Leblond** (faculty) presented "Mono and Diglactosyldiacylglycerol Composition of Brown Algae Genus Sphacelaria: a Modern Interpretation using Position-Ion Electrospray/Mass Spectrometry."

Travis Rush, **Erin McClelland** (faculty) presented "Identification of *Cryptococcus neoformans* Virulence Factors by Means of a *Caenorhabditis elegans* Killing Assay."

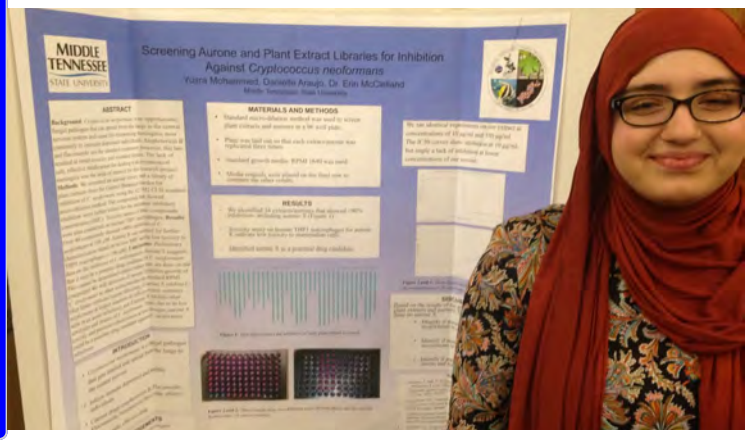
Tiara Rainer, **Jonathan Bowling** (graduate student), **Andrew Nolan**, **David Nelson** (faculty) presented "Development of Live Cell Tools to Study Defects in Mitochondrial Quality Control in Parkinson's Disease."



Thuy Huynh, **Cara Vielhauer**, **Melissa Pompilius** (graduate student), **Robert Fischer** (faculty) presented "Thermal Tolerance of Invasive and Native *Daphnia* from the Alabama River Delta."

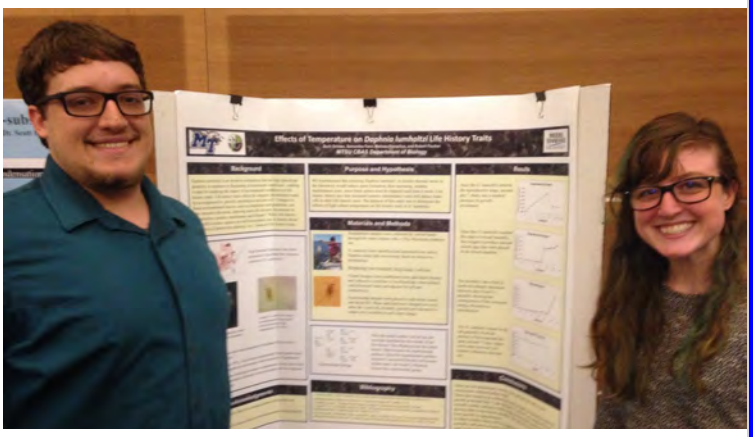
Trang Huynh, **Stephen Wright** (faculty) presented "Assessment Of Traditional Chinese Medicine Herbal Extract's Potential to Inhibit Herpes Simplex Virus Type 1."

Yusra Mohammed, **Danielle Araujo** (graduate student), **Erin McClelland** (faculty) presented "Screening Aurone and Plant Extract Libraries for Inhibition against *Cryptococcus neoformans*."

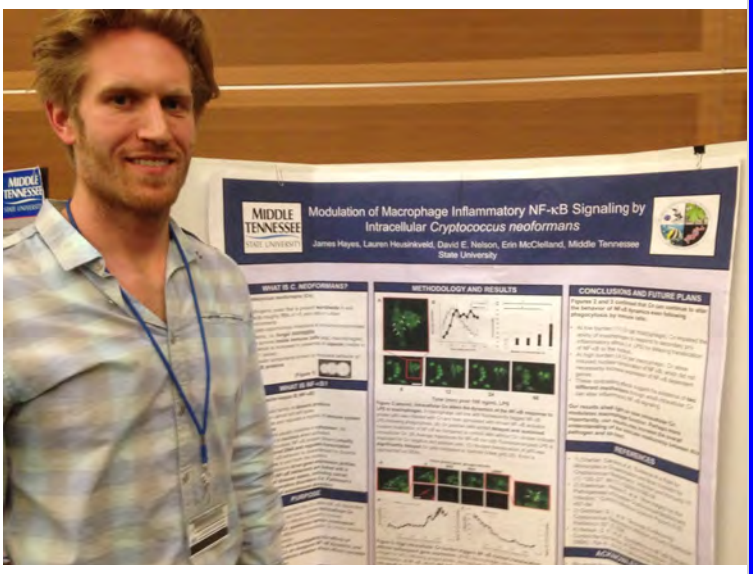


Scholars Week cont.

Zach Grimes, **Samantha Fann**, **Melissa Pompilius** (graduate student), **Robert Fischer** (faculty) presented "Effects of Temperature on *Daphnia Lumholtzi* Life History Traits."

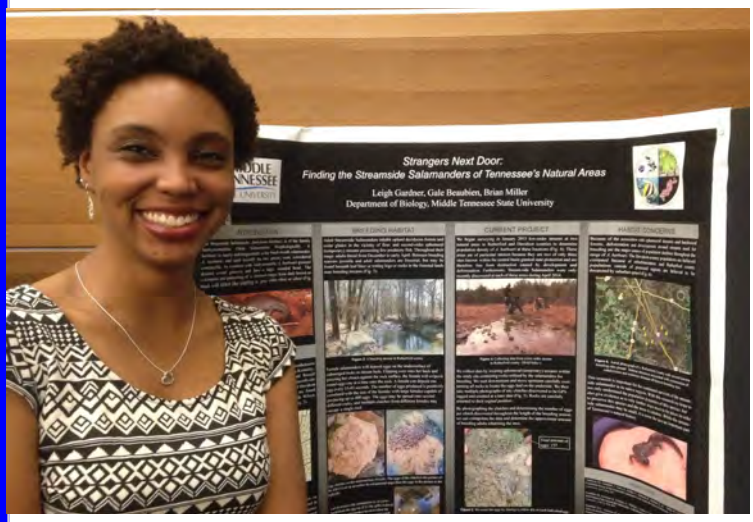


James Hayes, **Lauren Heusinkveld** (undergraduate student), **David Nelson** (faculty) **Erin McClelland** (faculty) presented "Modulation of Macrophage Inflammatory NF-kB Signaling by Intracellular *Cryptococcus neoformans*."



Matt Fuller, **Shannon Smith**, **Bruce Cahoon**, **Elliot Altman** (faculty) presented "The Efficient Initiation of Callus and Suspension Cultures of American Ginseng (*Panax quiquefolius* L)."

Leigh Gardner, **Gale Beaudien**, **Brian Miller** (faculty) presented "Strangers Next Door: Finding the Streamside Salamanders of Tennessee's Natural Areas."



The next Scholars Week is

Mar. 28-Apr. 1, 2016

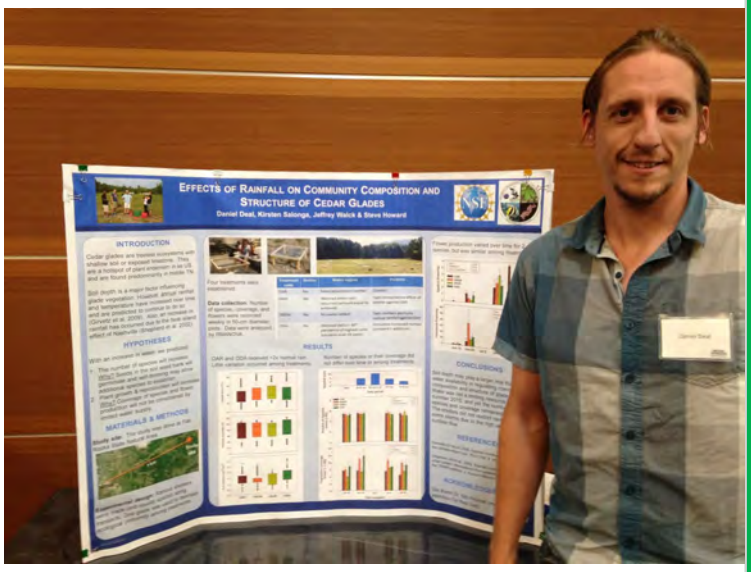
Summer Research Celebration 2015

Middle Tennessee State University held its Summer Research Celebration on July 31, 2015 in the main ballroom of the Student Union Building. The department presented ten posters. Authors of these posters included 11 faculty members, five graduate students, and 12 undergraduate students.

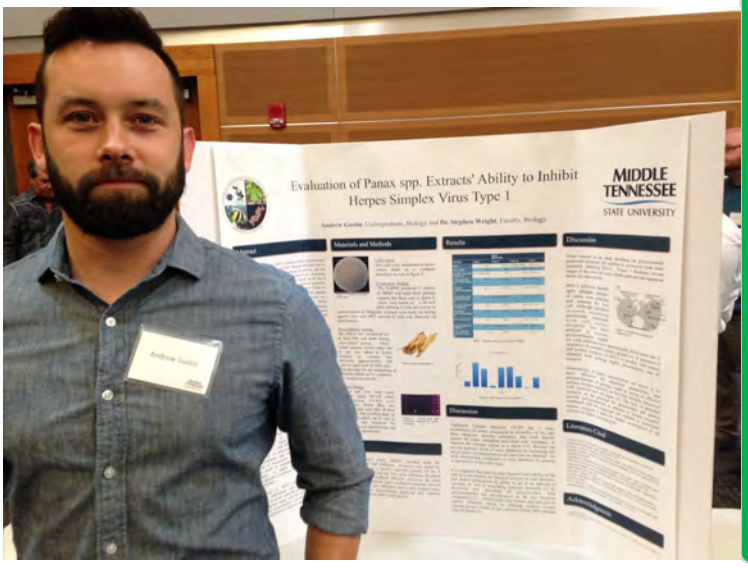
Faculty members involved in mentoring these students deserve credit for their time, effort and expertise in these research projects. Many people from across campus saw the quality of research being conducted in the department. Congratulations to all authors for a job well done! Poster authors and titles from the Department of Biology are below.

Undergraduate Student Presentations

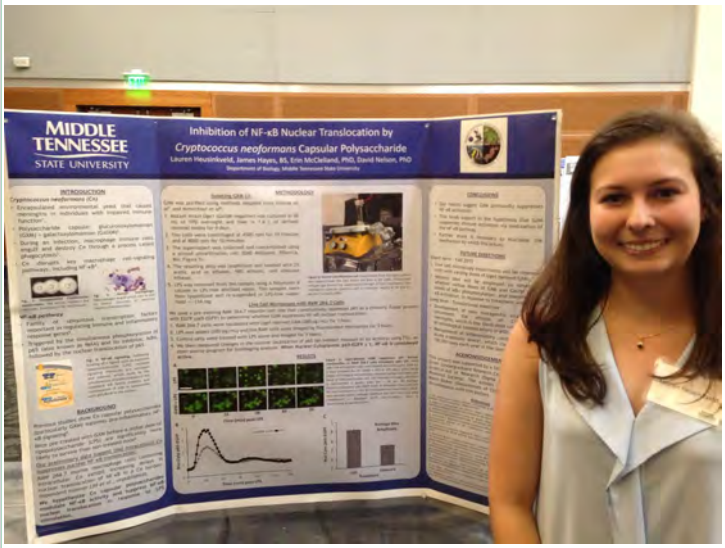
Daniel Deal, **Kirsten Salonga**, **Jeffrey Walck** (faculty), **Steve Howard** (faculty) presented "Effects of Rainfall on Community Composition and Structure of Cedar Glades."



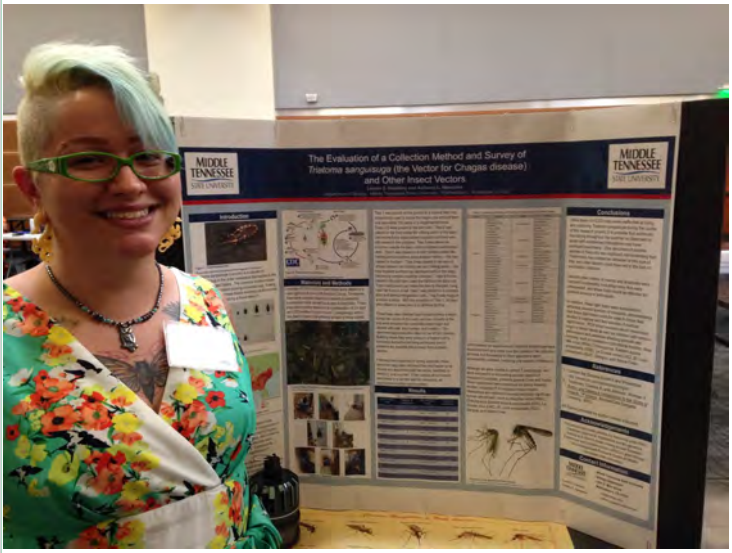
Andrew Gustin, **Stephen Wright** (faculty) presented "Evaluation of *Panax* spp. Extracts' Ability to Inhibit Herpes Simplex Virus Type 1."



Lauren Heusinkveld, **James Hayes** (graduate student), **Erin McClelland** (faculty), **David Nelson** (faculty) presented "Inhibition of NF-kB Nuclear Translocation by *Cryptococcus neoformans* Capsular Polysaccharide."

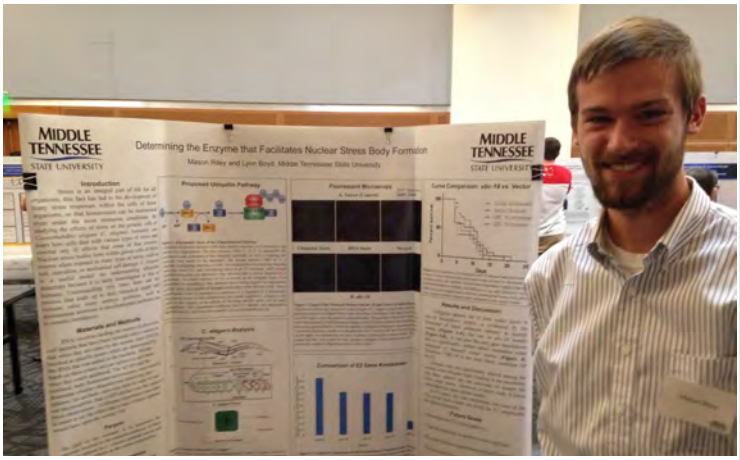


Lauren Hanberry, **Anthony Newsome** (faculty) presented "The Evaluation of a Collection Method and Survey of *Triatoma sanguisuga* (the Vector for Chagas Disease) and Other Insect Vectors."

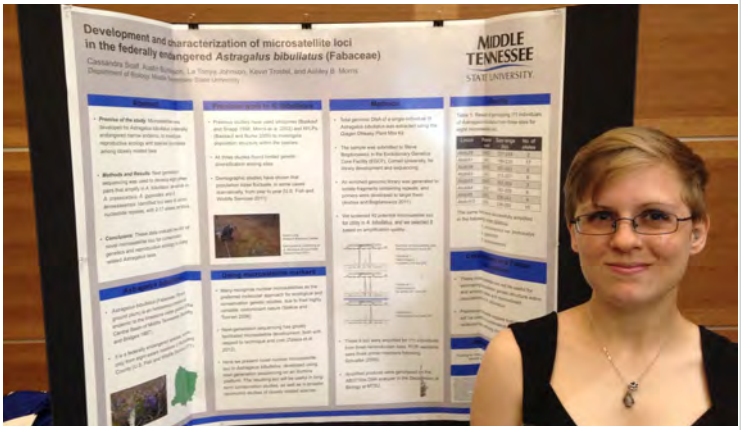


Summer Research Celebration 2015 cont.

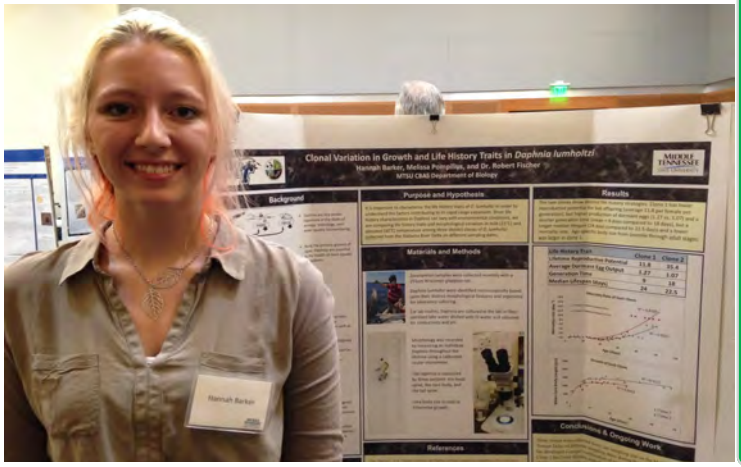
Mason Riley, **Lynn Boyd** (faculty) presented "Determining the Enzyme that Facilitates Nuclear Stress Body Formation."



Cassandra Scalf, **Austin Burleyson**, **LaTonya Johnson**, **Kevin Trostel**, **Ashley Morris** (faculty) presented "Development and Characterization of Microsatellite Loci in the Federally Endangered *Astragalus bibullatus* (Fabaceae)."



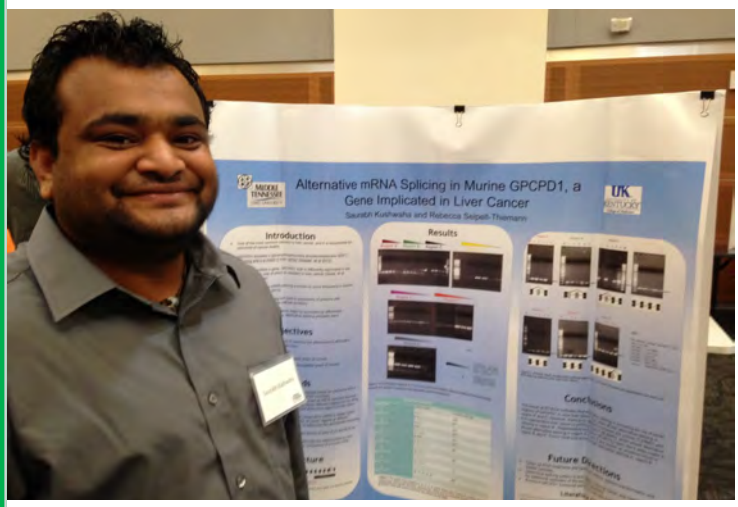
Hannah Barker, Melissa Pompilius (graduate student), **Robert Fischer** (faculty) presented "Clonal Variation in Growth and Life History Traits in *Daphnia lumholtzi*."



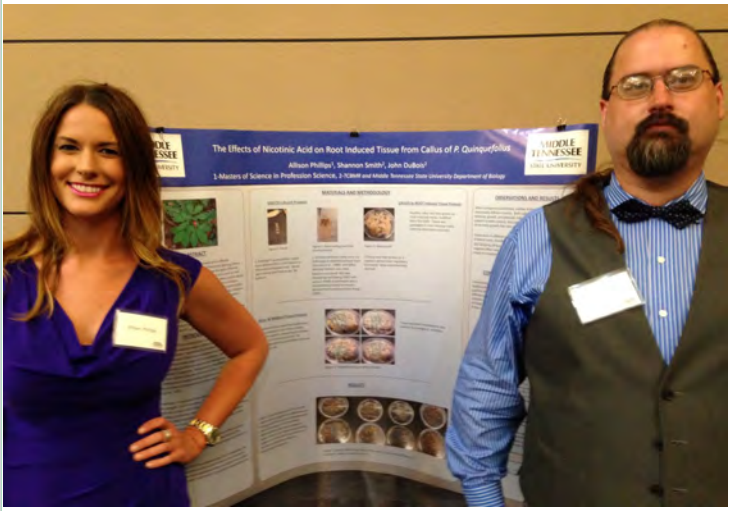
Cara Vielhauer, **Melissa Pompilius** (graduate student), **Robert Fischer** (faculty) presented "*Daphnia* Egg Banks as Biotic Reservoirs in Dynamic Environments."

Graduate Student Presentations

Saurabh Kushwaha, **Rebecca Seipelt-Theimann** (faculty) presented "Alternative mRNA Splicing in Murine GPCPD1, a Gene Implicated in Liver Cancer."



Allison Phillips, **Shannon Smith**, **John DuBois** (faculty) presented "The Effects of Nicotinic Acid on Root Induced Tissue from Callus of *P. quinquefolius*."



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, Human Anatomy and Physiology I and II, Comparative Anatomy of the Vertebrates, and Medical Botany. 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: BIOL 1030 lecture and Anatomy and Physiology I labs

Dr. Alicja Lanfear, B.S., 2006, Cumberland University; M.S., 2008, MTSU; Ph.D., 2012 University of Tennessee - Knoxville. Teaching: BIOL 1030 lecture and Anatomy and Physiology I labs

Dr. Christopher Brian Manning, B.S., 1996; M.S., 1998, MTSU; Ph.D., 2003, University of Vermont. Teaching: Biology 2010 lecture and Anatomy and Physiology II, 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. Thomas Hemmerly, A.M., 1955, Peabody College; Ed.D., 1964, Peabody College. Teaching: Economic Botany.

Ms. Suzanne Hicks, B.S., 2009, MTSU; M.S.P.S., 2014, MTSU. Teaching: BIOL 1031 labs.

Dr. Karen Maynard, B.S., 2006, Martin Methodist College; P.S.M., 2009, MTSU; Ph.D., 2014 MTSU. Teaching: Anatomy and Physiology I and II labs.

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

Ms. Deborah Thomas-Knott, B.S., 1991, Brigham Young University; M.S., 2015, MTSU. Teaching: Microbiology Labs.

BioUpdate

Lynn Boyd, department chair (Lynn.Boyd@mtsu.edu)
John D. DuBois, editor (John.Dubois@mtsu.edu)

Produced by MTSU
Department of Biology

Biology Department Scholarship Winners, 2015

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.
Clayton Mitchell **Andrew Conner Moss**

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

Philip M. Mathis Outstanding Junior Award and Scholarship: Awarded annually to a Biology major of junior standing.
Trang Huynh **Rachel A. Yates**

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.
Joseph Mosqueda **Martina Ramos**

Elliott Dawson/BioVentures Biotechnology Scholarship: Awarded to a Biology major of junior standing or above who has taken, or currently enrolled in Biotechnology.
Lauren Heusinkveld **Rachel A. Yates**

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. **Diamondie Wilson**

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

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

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

John D. DuBois Scholarship: Awarded to an undergraduate or graduate students to provide travel for paper presentations at scientific meetings.
Jayaneththi Kora R Bandara

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

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

Charles Holland Biology Club Scholarship: Available to students enrolled in the graduate program
Erin N. Floyd

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

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

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

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

Mitchell Magid: Awarded for students doing research or internships in Organismal Biology.
Logan Whiles

Biology Department Scholarship Winners, 2015

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

Kevin M. Trostel

Sarah H. Swain Undergraduate Research Scholarship: Awarded to purchase supplies or support travel associated with research projects.

Sydney Youngman

Padgett Kelly Research Scholarship: Awarded to an undergraduate or graduate student to support summer studies of field research in ecology or conservation biology.

Eric J. Limbird **Phillip Parsley**

Kurt E. Blum Botany Research Scholarship: Awarded in support of graduate research in botany.

Kevin M. Trostel

William H. Butler, Jr. Graduate Research Scholarship: To provide support for expenses associated with thesis research

Rayne Leonard

Thomas Hemmerly Graduate Research Support Fund: To provide travel and/or supplies necessary for thesis research

Rayne Leonard **Phillip Parsley**

Brian Miller Graduate Research Scholarship: Awarded to support research of second year graduate students conducting field studies on Herpetology or Biospeleology in Tennessee.

Sarah J. Kirkpatrick

Major Field Test High Score

Fall 2014

Charity Dunn	**Joseph Mosqueda**
Tim Flynn	**Cedric Thompson**
Shaela Dennis	**James Crosslin**

Spring 2015

Matthew Fuller	**John Burton**
Samuel Morton	**Mary Boyd**
Jonathan Byrd	**Mitch Merryman**
Connor Olson	**Jamison Price**

Incoming Freshman Scholarships 2015-2016

Mary C. Dunn Freshman Scholarships: Awarded annually to an incoming freshman Biology major. Given to the first and second place scorer on a departmental exam given in April each year.

Hannah Hall **Ngozi Omatu**

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.

Devyn Hayes

Ellis Rucker Freshman Scholarship: Awarded annually to an incoming freshman Biology major. Given to the fourth place scorer on a departmental exam given in April each year.

Devyn Hayes

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, along with an update of your professional/career activities, awards, 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 inforation.

Send contact information and updates to

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Fax: (615) 898-5093
E-mail: John.Dubois@mtsu.edu.