



BioUpdate

Department of Biology, Middle Tennessee State University

Spring 2016

From the Editor



John DuBois,
Editor

In this issue

- In Memoriam
Dr. Thomas Hemmerly
Mr. Eugene Strobel
- Zip Tie Domes
- Center for Environmental Education and Environmental Studies & TAMP
- Bits & Pieces
- Dept. Graphic Items
- CBAS Scholars Week Posters in the Atrium
- Spring Scholars Week Posters

Greetings to all *BioUpdate* readers. This is the space typically reserved for the Chair's Message. Since *BioUpdate* became a semiannual publication, I decided not to have Dr. Lynn Boyd write two messages per year. We will continue with the "Chair's Message" in the fall issues and "From the Editor" in the spring issues.

The purpose of making *BioUpdate* a semiannual publication was to reduce its size (previous issues were 25-plus pages) and to keep the information current. However, this issue of *BioUpdate* is still 20 pages long! That is mostly due to the amount of research being conducted and presented by our students and faculty. There are 4½ pages displaying the 25 biology posters that were presented at the College of Basic and Applied Sciences' Posters in the Atrium during the annual MTSU Scholars Week. In addition, there are six pages displaying the 33 biology posters presented at the University-wide Scholars Week poster session. Both these poster sessions were well-attended by the MTSU community and highlighted the high level of research being conducted by faculty, graduate students, and undergraduate students in our department. Our students received five of the 12 awards given to the College of Basic and Applied Sciences. The department commends the students on their research and the faculty involved for their mentoring.

On a more somber note, this issue reports the deaths of two former faculty members. Dr. Thomas Hemmerly passed away in mid-February this year. The department learned of the death of Mr. Eugene Strobel at the end of March this year. These two teachers/scholars contributed a combined 90 years of service to the department. They helped to shape our curriculum by offering new courses and authoring or co-authoring laboratory manuals used in our freshman courses. In addition, both mentored numerous students in coursework, research, and life in general. Dr. Hemmerly's career will be celebrated at the 39th Annual Elsie Quarterman Cedar Glade Wildflower Festival on April 29 at Cedars of Lebanon State Park.

In the rest of this newsletter, I hope you enjoy reading about the many exciting things going on in the department. Please stay in touch by sending a note or emailing us about your activities and accomplishments.

John DuBois



In Memoriam

It is with great sadness that the Department of Biology reports the deaths of Dr. Thomas Hemmerly and Mr. Eugene Strobel. Dr. Hemmerly served the department from 1964 to 2007 as a full-time member of the faculty and an additional eight years to 2015 as an adjunct member of the faculty. Mr. Strobel served the department from 1955 to 1994. Together, they gave the department 90 years of teaching, research, and advising. Both contributed to the development of the department by adding courses to our curriculum and authoring or co-authoring laboratory manuals used in our courses. These two educators mentored numerous undergraduate and graduate students during their tenure. Both will be missed, but their contributions never forgotten.



Dr. Thomas E. Hemmerly died Feb. 14, 2016. He was born and reared in Nashville. After attending the public schools there and graduating from Issac Litton High School, he entered Trevecca Nazarene College where he earned an A.B. degree with a major in Biology and a minor in Mathematics. He later earned both master's and specialist's degrees in Biology from George Peabody College for Teachers and a Ph.D. degree in Plant Ecology from Vanderbilt University. In addition to his formal education, Dr. Hemmerly remained abreast of a variety of topics through participation in special workshops and institutes at such places as the University of Georgia, North Carolina State, Christian Brothers College, and McGill University. He devoted much of his energy to the study of the flora of the Appalachian Mountains and to the development of botany courses emphasizing economic and medicinal themes.

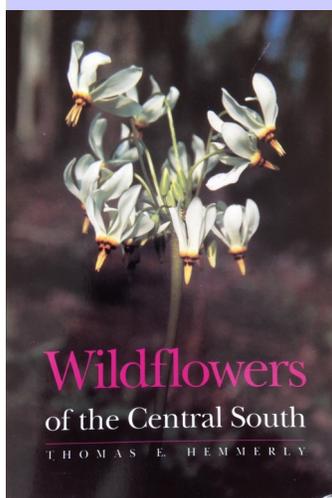
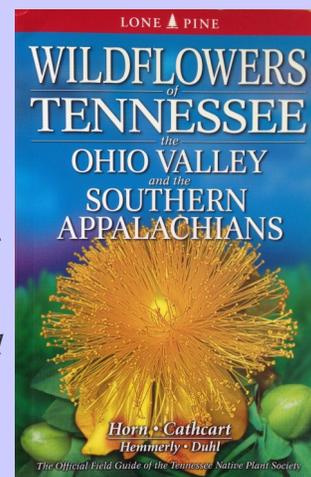
His professional experience prior to coming to MTSU included positions as a research assistant at the George Hunter Laboratory of Infectious Diseases at Vanderbilt (two years) and assistant professor of biology and chemistry at Trevecca Nazarene College (five years).

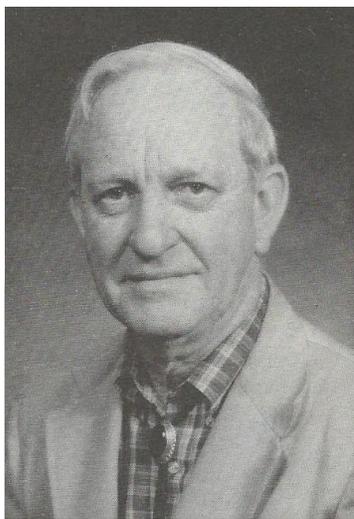
After joining MTSU in 1964, Dr. Hemmerly developed a solid reputation for professionalism and productive research. His knowledge of botany and capabilities as a nature photographer led to the publication of 39 slide sets marketed commercially through JLM Visuals (Grafton, Wis.) and Carolina Biological Supply Co. (Burlington, N.C.). He completed numerous book reviews for the *Association of Southeastern Biologists Bulletin*, *The Tennessean*, and *Economic Botany* (journal of the international Society for Economic Botany). He authored or co-authored two dozen papers in peer-reviewed journals and participated in numerous invited symposia at such places as the University of Illinois and the University of Marburg (Germany). He authored or co-authored six books, including *Wildflowers of the Central South*, *Investigations in Biology*, and *Appalachian Wildflowers: An Ecological Perspective*. In addition, Dr. Hemmerly was a world renowned expert on mistletoe.

He shared his interests and expertise with the public through participation in a variety of programs sponsored by MTSU, Cedars of Lebanon State Park, the Nature Conservancy, and the Great Smoky Mountains National Park.

Dr. Hemmerly was more than a productive researcher and nature lover; he was also a valued teacher and trusted advisor. While at MTSU, he initiated and developed numerous courses. He taught General Biology, Plants and Man, Topics in Biology, Conservation Ecology, Medicinal Plants, and Nature Study. In addition to his "professional" hobby of biological photography, Tom was interested in travel and in collecting antique postcards. Specifically, he collected postcards of the 1900-1920 period, a period he called "the golden age of postcards!"

Dr. Hemmerly is survived by his daughter, Kathy Roadarmel, and her husband Tod of Mt. Juliet; son, Thomas Everett Hemmerly, and his wife Hannah of Murfreesboro; grandchildren, Andy and Cara Roadarmel, Amanda and Amy Haynes, Preston and Layla Hemmerly; great-grandchildren, Grace, Nicholas and Zachary Haynes, Clover Roadarmel, Ava and Austin Lightburn; brothers, Harry Hemmerly of Nashville, and Kenneth Hemmerly of Tallahassee, Florida; sister in law, Dottie Moore, and her husband Carl of Nashville.





Eugene Strobel of Bell Buckle passed away March 30, 2016. He was born in Nashville to the late Robert William and Mary Langdon Strobel. He attended elementary school at the Cathedral School and graduated from Father Ryan High School in 1945. Among his fellow graduates in the 1945 class at Father Ryan were former Metro Councilman Tom Sharp, publisher John Seigenthaler, and attorney George Barrett. After graduating from Father Ryan, he spent a year in the U.S. Navy, his span of duty being reduced when World War II ended.

Mr. Strobel then entered George Peabody College, where he earned a B.S. degree in 1950 and an M.A. degree in 1951. After teaching in Alabama at the high school level for a year, he landed a teaching position at Delta State College in Cleveland, Mississippi. There he met and later married Katherine Bronn, a young dance instructor from Natchez, Mississippi. The newlyweds moved to Nashville in 1954 so that he could be near Vanderbilt University where he had begun a Ph.D. program. But when their first child, Amy, came a year later, he was forced to seek employment and found it at nearby Middle Tennessee State College. He taught at MTSC until 1960 when he left to take a position at Mississippi State College for Women in Columbus, Mississippi. Three years later, the Strobel family, which now included the two younger daughters, Jane and Mary Ann, moved to Baton Rouge, Louisiana, where he entered the Ph.D. program at Louisiana State University. In 1968 he returned to Middle Tennessee State, which by now had attained university status, to teach endocrinology and to coordinate the freshman-level biology courses.

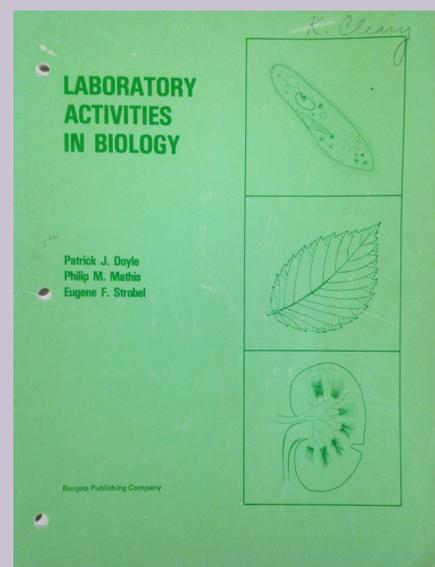
In addition to being an effective instructor who upheld high standards, Mr. Strobel had long been respected for his all-around scholarship. He helped many a colleague and graduate student craft a better sentence or write a better paragraph. As a serious student of the English language, his accumulated knowledge enabled him to unravel enigmatic words with the best of etymologists. He was equally at home in discussing contemporary politics, Roman history, educational philosophy, garden flora, or the homeostatic mechanisms of animals. He published in *Endocrinology* and in the *Journal of the Mississippi Academy of Science*. He co-authored several laboratory manuals in biology, including one previously used by MTSU freshmen.

His passions were reading, travel, politics, friends, and family. He and Katherine, a recognized authority on American folk dance and a former MTSU professor, traveled to Europe on three different occasions, once to the eastern part, once to the western part, and once to the Mediterranean region. After retirement, he enjoyed the quiet environs of Bell Buckle where he had lived since 1976 and where he was mayor during 1978-86. But more than anything, he enjoyed his grandchildren.

Mr. Strobel is survived by his wife of 62 years, Katherine Bronn Strobel; three daughters, Amy Strobel of Brooklyn, New York, Jane Strobel of Murfreesboro, and Mary Ann Strobel Bartlett of Monteagle; four grandchildren, Samuel Bartlett of Vail, Colorado, Helen Bartlett of Denver, Jason Bartlett of New Orleans, and Benjamin Strobel of Murfreesboro; sister, Joan Strobel of Nashville; and numerous nieces and nephews. In addition to his parents, he was predeceased by three brothers, Robert Strobel, Raymond Strobel, and Carl Strobel.



Gene Strobel, second from left, was honored by MTSU President James E. Walker, Dean of Basic and Applied Sciences Earl Keese, and Nashville publisher John Seigenthaler.



Alumnus Inventor Gives MTSU Domes for Drone, Spider Research

Alumnus John Hurt's unique donations of geodesic domes to the MTSU Aerospace and Biology departments will aid unmanned aircraft systems and spider research for students and faculty. Hurt (Class of '82) owns Buffalo Valley, Tennessee-based Zip Tie Domes, which makes 10- to 25-foot structures primarily used for chicken coops and greenhouses. To view video from the December building of a dome at the MTSU Farm in Lascassas, visit https://youtu.be/k9Jems_AYig.

A Pre-Law and Political Science major while attending MTSU, Hurt received a U.S. patent for his geodesic dome kits in 2013, and later patents from New Zealand, Australia, and the United Kingdom. The one-time computer programmer left after working 30 years for the state of Tennessee. He started Zip Tie Domes in May 2014.

Through his inventive efforts, Hurt's university generosity includes:

- Loaning the MTSU Jennings A. Jones College of Business a dome for a team-building class project.
- Giving two 10-foot domes for Biology associate professor Ryan Otter's spider research.
- Giving one to Aerospace that was constructed in December at the MTSU Farm for the UAS program.
- Providing three domes for Tennessee Technological University in Cookeville, for poultry research.



John Hurt, an MTSU alumnus who invented and received the patent for Zip Tie Domes, donated one dome for aerospace unmanned aircraft systems at the MTSU Farm in Lascassas, Tenn., and two domes for biology-related spider research. While awaiting FAA approval to fly unmanned aircraft, or drones, at the farm, they can be flown inside the dome. (MTSU photo by Randy Weiler)



MTSU alumnus and Zip Tie Domes inventor John Hurt, left, uses stainless steel zip ties to connect ends of PVC pipe to one another in the dome constructed in December at the MTSU Farm in Lascassas, Tenn. Waiting to hand him more zip ties is Doug Campbell, MTSU aerospace unmanned aircraft systems manager. (MTSU photo by Randy Weiler)

"I just wanted to help," Hurt said of his geodesic dome donations. He added he is "open to building another one" at the farm. The domes are constructed with 1.5-inch PVC pipe. Stainless steel zip ties hold adjoining ends together. Once the top is added, the dome becomes a solid piece, Hurt said. Aerospace's Unmanned Aircraft program will use the dome for testing and evaluation purposes in the enclosed environment, said Doug Campbell, who manages the UAS program.

"When we apply to the Federal Aviation Administration for permission to fly our unmanned aircraft out here, the first thing we have to ensure is that the aircraft is air-worthy," Campbell said. "Doing air-worthiness evaluation, doing the hover checks, doing build checks on

aircraft we've constructed either from kits or individual components and sharing that that build is of sufficient quality to be air-worthy is the objective." Development director Nicole Chitty said the College of Basic and Applied Sciences is really excited the domes have been given to Aerospace and Biology.

"The domes will be a tremendous help to students in these aerospace and biology programs," she said. Biology associate professor Otter said the domes will become "artificial habitats for use in our field work" related to the Kingston, coal ash spill in December 2008. "In my lab, we work with spiders that live at the edges of rivers and lakes and when we collect spiders we look on the tree branches that overhang the water," Otter added. "With these domes, we are hoping to build artificial habitats that spiders will use, so we improve our collection efficiency. We are very optimistic and think they can really help us in our field research."

(Release from MTSU News and Media Relations)



Ryan Otter and his students will be able to utilize two 10-foot Zip Tie Domes for spider research starting spring 2016. (MTSU file photo by J. Intintoli)

Center for Environmental Education and Environmental Studies

The MTSU Center for Environmental Education and Environmental Studies has not had a home base for the last year and a half due to building renovations taking place on campus. Staffing reductions and the retirement of Dr. Padgett Kelly have also had an effect on the quantity of outreach the center has done. Nevertheless the center continues to serve learners of all ages, formal and non-formal educators, and the overall community of Middle Tennessee.

A number of Mathematical and Science Education Ph.D. candidates have worked on center programs and outreach. One is **Heather L. Barker**, who directed a session of Camp Marvel. Camp Marvel is a program through Murfreesboro City Schools that offers enrichment experiences to elementary-age students. In May of 2015, pre-service elementary majors from MTSU led environmental education activities for nearly 100 students at Discovery Center in Murfreesboro.



Murfreesboro City students and MTSU pre-service teachers at Camp Marvel, summer 2015



Presentations and workshops at professional conferences were conducted by **Dr. Cindi Smith-Walters** and a number of these students (**David Owens, Heather L. Barker, Angelique Troelstrup, Vee Fanis-Napoleon**) as well as **Dr. Alicja Lanfear**. These organizations and events include, but are not limited to, the Tennessee Environmental Education Association, Tennessee Academy of Science, the Association of Science Teacher Educators, National Science Teachers Association, and even MTSU's own Scholars Week.

Smith-Walters continues her work with the Tennessee Naturalist Program (TNP) and serves as state treasurer for this organization. In addition, she assists in conducting the forestry education class for several chapters, including the Owls Hill and the Cedars of Lebanon State Park chapters. TNP is an education training course designed to introduce the natural history of Tennessee to interested adults. After 40 hours of training and field work, TNP graduates each year provide 40 hours of volunteer service. These efforts toward education, outreach, and service are dedicated to the appreciation, understanding, and beneficial management of natural resources and natural areas within their communities. In brief, the purpose of TNP is to teach Tennesseans about our natural world, inspire the desire to learn more, instill an appreciation of responsible environmental stewardship, and channel volunteer efforts toward education of the general public and conservation of Tennessee's natural resources. TNP is a non-profit that is completely self-supporting and continues to grow in the number of chapters statewide and graduates providing service hours. For more information about TNP you can go to <http://tlnaturalist.org/>



This past year Smith-Walters has had two MTSU Public Service grants funded. One, co-authored with Dr. Kim Cleary Sadler was to initiate a Monarch Butterfly Conservation Garden at MTSU. Monarch butterflies are found through the U.S., and some populations migrate vast distances through multiple generations each year on their journey. Some take journeys of over 3,000 miles! Adults that begin the long journey north
(continued on page 6)

CEEEES (cont.)

from Mexico never return, but their offspring have an internal compass that returns them. This journey has become more perilous because of threats along the migratory paths and on breeding and wintering grounds. Threats include habitat loss - particularly loss of food plants including milkweed, the monarch caterpillar's sole food source - and mortality through pesticide use. Because of this, the U.S. Fish and Wildlife Service is conducting a status review of the monarch butterfly under the Endangered Species Act. The MTSU Public Service Committee provided funds to plan and begin work on the campus garden. The site selected is the north side of the courtyard of the new Science Building. After working closely with MTSU grounds crew and Facilities Services, ground will be broken this spring. Native milkweeds, as well as nectar plants such as Purple Coneflower, Joe-Pye Weed, and Iron Weed will be planted. It is hoped that the garden will not only provide for the needs of monarchs and other butterflies, but foster an appreciation and understanding of these often-overlooked animals.



The second MTSU Public Service Grant funded is "Project Archeology: Where History and Biology Collide." Project Archaeology (PA) is a nationwide program. In Tennessee the PA materials and training have been available on a limited basis for the last 15 years.



The grant will provide funding for 100 educators to attend PA training and receive selected PA materials. Archeology is an excellent way to teach scientific inquiry and cultural understanding. Curriculum materials include classroom-tested lessons to teach science, math, history, social studies, art, literacy and higher-level thinking skills including problem-solving, synthesis, and evaluation. The materials support Common Core state standards, especially through modeling the investigation process and are correlated to Tennessee state science and social studies standards. Because of the interdisciplinary nature of PA, teachers will

The grant will provide funding for 100 educators to attend PA training and receive selected

be able to seamlessly integrate science (STEM) with literacy, science, mathematics, social studies, and history. These workshops are co-sponsored by and offered through the Metro-Nashville Parks department.

In addition to her continued work in writing grants for small and large projects, Smith-Walters continues to serve on the review panel for the National Science Teachers Association's NSTA Recommends. NSTA Recommends is one of the best sources for thoughtful, objective recommendations of science-teaching materials, specifically nonfiction science trade books for children. Products recommended are among the best available supplements for science teaching. <http://www.nsta.org/recommends/>

The Tennessee Amphibian Monitoring Program (TAMP) was again funded this year by in the 2014-15 fiscal year by the Tennessee Wildlife Resources Agency and is housed in the MTSU Center. **Cindi Smith-Walters** works with **Bob**



English, TAMP director, to implement and grow the program. The photograph accompanying this article is one taken by English and his excellent leadership and varied talents have grown the program since 2004. Some accomplishments this past year include, but are not limited to, the following;

- Barking tree frogs were heard and recorded at a TAMP listening stop in Montgomery County after not being heard there since 2004! Barking tree frogs occur in three separate and distinct geographic areas in Tennessee, and monitoring these populations is what TAMP is all about.
- TAMP recently welcomed Lincoln Memorial University into the TAMP program. A five-hour TAMP workshop was conducted February 2015. Lincoln Memorial is located in Harrogate, and the prospect of getting data from four TAMP routes near Harrogate that have never been run before will greatly increase our knowledge of frog and toad populations in that area.
- A five-hour TAMP workshop was also conducted at the Research Station of the University of Tennessee

(Continued on page 7)

CEES (cont.)

last January (2015). Work to establish routes through work with UT-Martin in the extreme northwest corner of the state will provide additional important data.

- A yearly TAMP workshop continues to be offered at University of Tennessee in Knoxville. Participants are given a slide and sound presentation that covers all 21 frog and toad species in our state. Participants are then quizzed. This has been a popular workshop for the University of Tennessee and has been incorporated into the UT Wildlife and Fisheries Science Fall Camp.

Each new TAMP volunteer is given a copy of the TAMP CD. This CD is a joint venture between TWRA and MTSU and includes recordings of all species that occur in Tennessee, hypothetical species, a section on similar-sounding species, and sound quizzes. This CD has also been made available to educators statewide, including the growing cadre of Tennessee Naturalist Program participants.

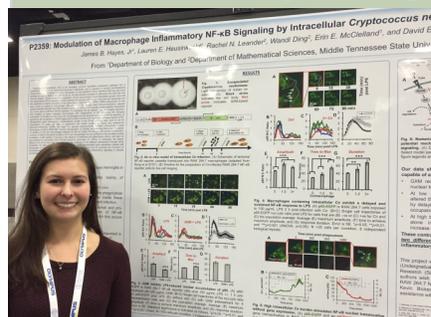
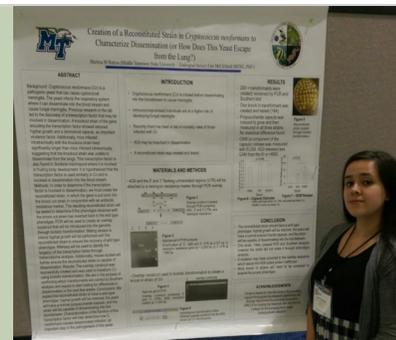
TAMP continues to work with the Tennessee Naturalist Program and in the last year has conducted two programs on Tennessee amphibians. These workshops with TNP are always popular and four new “frog loggers” from the ranks of TNP have begun or taken over routes.

As in previous years, all TAMP data has been entered into both into the NAAMP database and a GIS-based TAMP database. Information also continues to be entered into the integrated TAMP database which contains all data collected from 2004 to the present. This database is designed to be used with GIS and is incorporated in the Tennessee Wildlife Resources Agency's newly approved and implemented State Wildlife Action Plan (SWAP). The SWAP plan addresses the management of nongame species of greatest conservation need in the state, and we are happy to be part of this effort.

These are only a few of the efforts the center has been involved in this past year. If you would like more information regarding offerings and outreach or want to volunteer your expertise, contact us at Cindi.Smith-Walters@mtsu.edu or the assistant director (who also heads the MTSU Center for Cedar Glades Study) Kim Sadler at kim.sadler@mtsu.edu.

Bits & Pieces

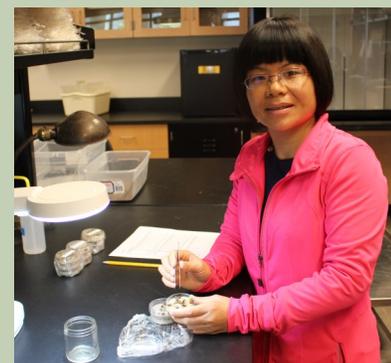
Martina Ramos, an Honors student in the lab of **Dr. Erin McClelland**, presented her poster “Creation of a Reconstituted Strain in *Cryptococcus neoformans* to Characterize Dissemination (or How Does this Yeast Escape from the Lung?)” at the Annual Biomedical Research Conference for Minority Students in Seattle in November 2015. Ramos graduated in December 2015 and is entering a Ph.D. program.

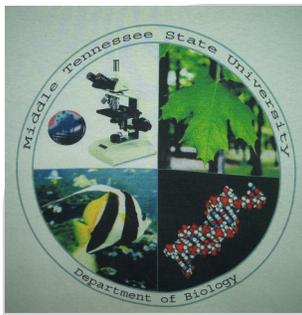


Dr. David Nelson and Lauren Heusinkveld (undergraduate Honors student) traveled to San Diego during Fall 2015 to present their poster “P2359: Modulation of Macrophage Inflammatory

NF-κB Signaling by Intracellular *Cryptococcus neoformans*” at the annual American Society for Cell Biology conference. Their project, which was performed in collaboration with **Dr. Erin McClelland** (Biology) and Wandi Ding and Rachel Leander from the Department of Mathematical Sciences, investigated the effect of an intracellular yeast pathogen, *Cryptococcus neoformans*, on inflammatory signaling in macrophages. Nelson gave a talk during the Mammalian Cell Signaling Minisymposium. As well as enjoying the excellent weather, they were able to attend symposia on super-resolution microscopy presented by the Nobel Laureates, Drs. Eric Betzig and William E. Moerner, as well as many other enlightening lectures.

Dr. Feng-lan Wang is a Visiting Scholar in **Dr. Jeffrey Walck’s** laboratory for one year. She is an associate professor from the College of Horticulture and Landscape Architecture, Zhongkai University of Agriculture and Engineering, Guangdong, China. She is carrying out a variety of experiments comparing seed germination of nonnative and native plant species.





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-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	Drawstring backpack:	\$5.00
Polo shirts	Short-Sleeve:	\$25.00	Coffee Mugs:	\$3.00
	Long-Sleeve:	\$28.00	Stadium Cups:	\$1.00
Heather gray pull-over hoodie: (printed like T-shirts)	\$25.00		Key Lanyards:	\$2.00

All items can be purchased (cash only) in the department office from Becky Elrod (615-494-7672) or by email (Rebecca.Elrod@mtsu.edu). Purchases are not tax-deductible.



Scholars Week: Posters in the Atrium

Middle Tennessee State University held its annual Scholars Week March 28-April 1, 2016. The College of Basic and Applied Sciences held a poster session on Tuesday, March 29, 2016 in the Science Building atrium.

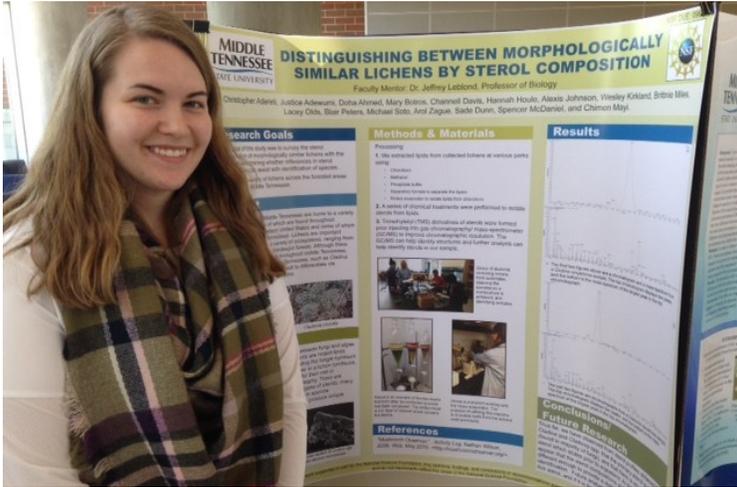
The department was well-represented with 25 posters. Authors of these posters included 15 faculty members, 22 graduate students, and 26 undergraduate students.

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!

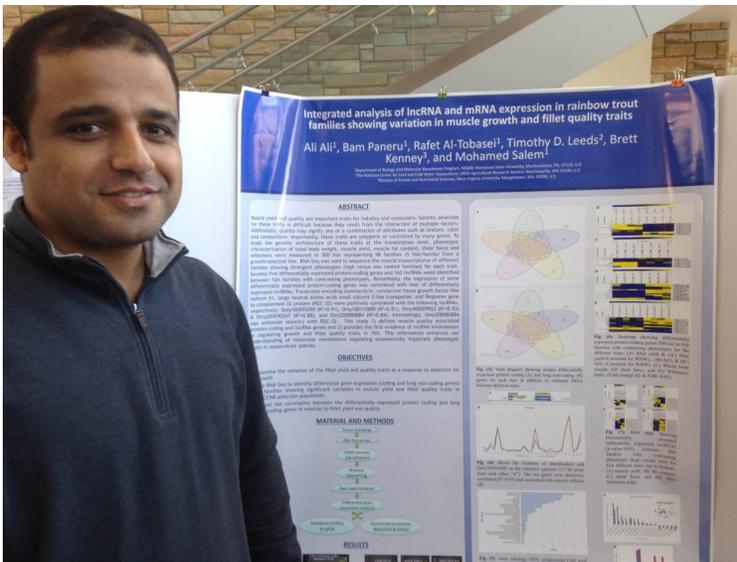


Posters in the Atrium (cont.)

Christopher Adereti, Justice Adewumi, Doha Ahmed, Mary Botros, Channell Davis, Hannah Houle, Alexis Johnson, Wesley Kirkland, Brittnie Miles, Lacey Oids, Blair Pedora, Michael Soto, Arol Zague, Sade Dunn, Spencer McDaniel, Chirron Mayi, and Jeffrey Leblond (faculty) presented “Distinguishing Between Morphologically Similar Lichens by Sterol Composition.”



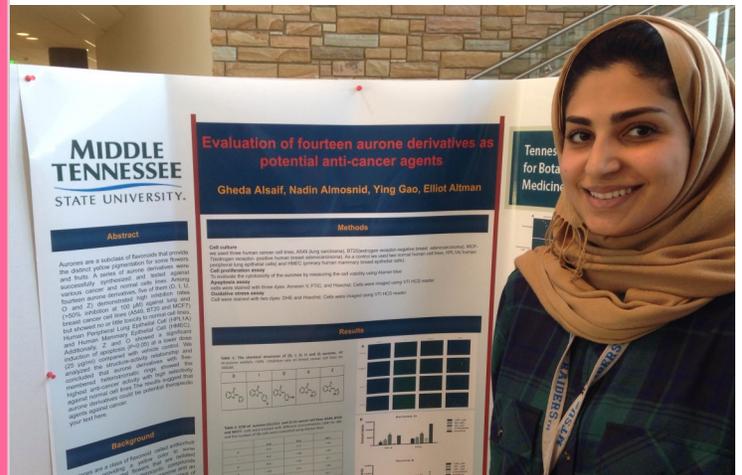
Ali Ali, Bam Paneru, Rafet Al-Tobasei, Timothy D. Leeds, Brett Kenney, and Mohamed Salem (faculty) presented “Integrated analysis of lncRNA and mRNA Expression in Rainbow Trout Families Showing Variation in Muscle Growth and Fillet Quality Traits.”



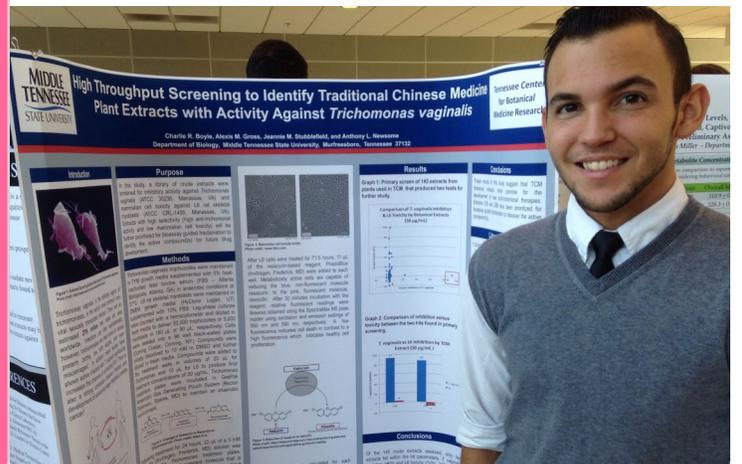
Nadin Almosnid, Ying Gao, and Elliot Altman (faculty) presented “*In Vitro* Cytotoxicity and Initial Safety Evaluation of Extracts from Sixteen Plants Used in Yao Ethnomedicine.”



Gheda Alsaif, Nadin Almosnid, Ying Gao, and Elliot Altman (faculty) presented “Evaluation of Fourteen Aurone Derivatives as Potential Anti-cancer Agents.”

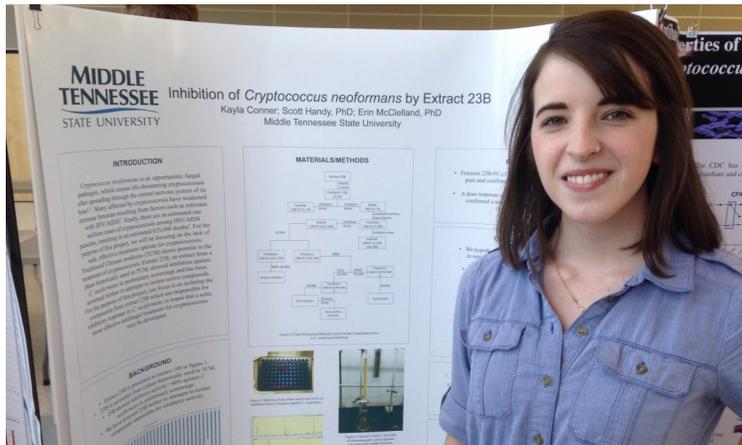


Charlie R. Boyle, Alexis M. Gross, Jeannie M. Stubblefield, and Anthony Newsome (faculty) presented “High Throughput Screening to Identify Traditional Chinese Medicine Plant Extracts with Activity Against *Trichomonas vaginalis*.”

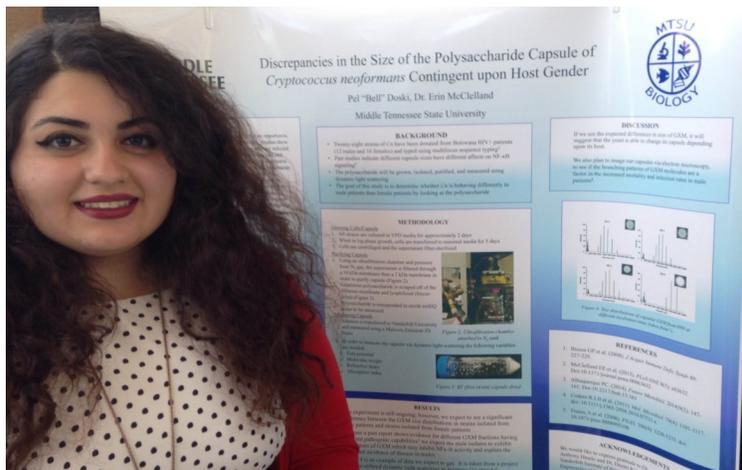


Posters in the Atrium (cont.)

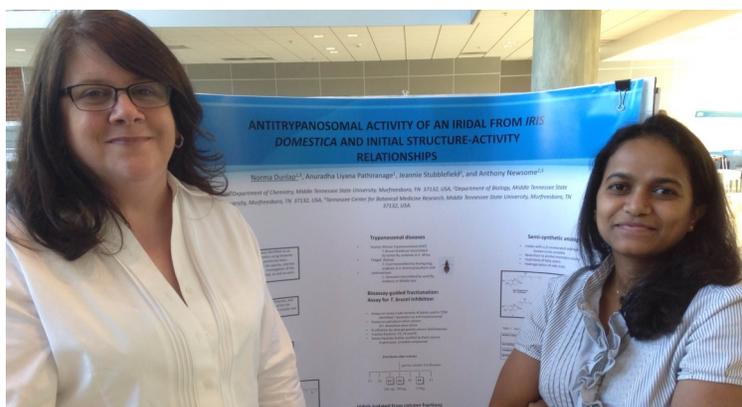
Kayla Conner, Scott Handy, and Erin McClelland (faculty) presented “Inhibition of *Cryptococcus neoformans* by Extract 23B.”



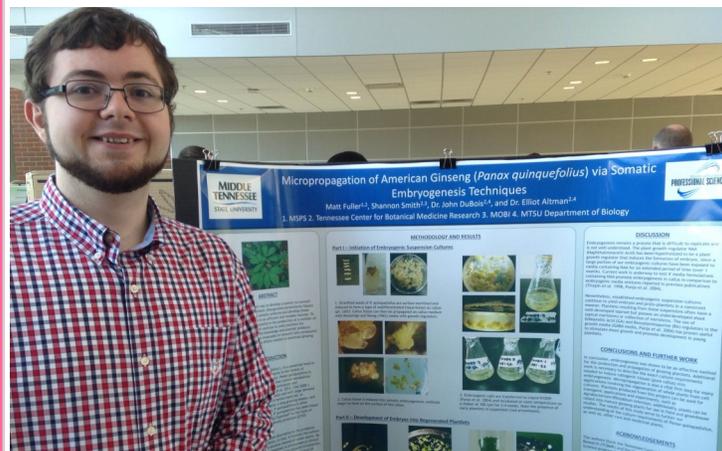
Pel “Bell” Doski and Erin McClelland (faculty) presented “Discrepancies in the Size of the Polysaccharide Capsule of *Cryptococcus neoformans* Contingent upon Host Gender.”



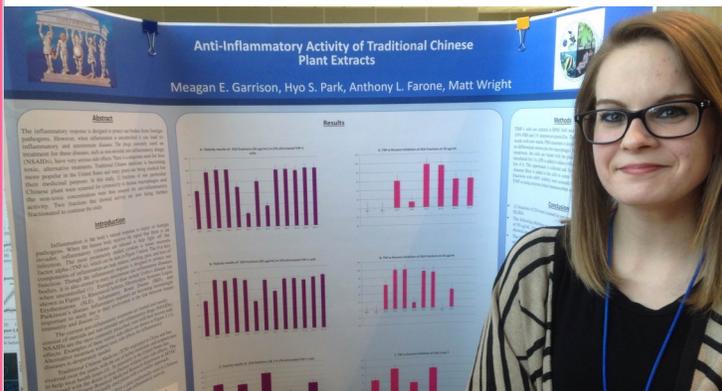
Norma Dunlag, Anuradha Liyana Pathiranage, Jeannie Stubblefield, and Anthony Newsome (faculty) presented “Antitrypanosomal Activity of an Iridal from *Iris domestica* and Initial structure-Activity Relation-



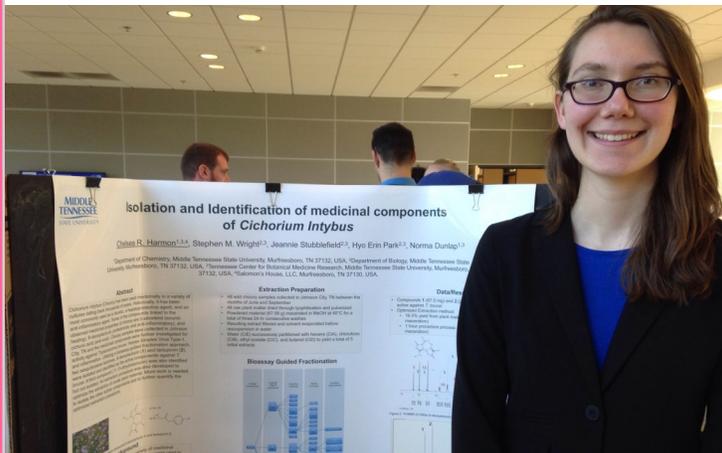
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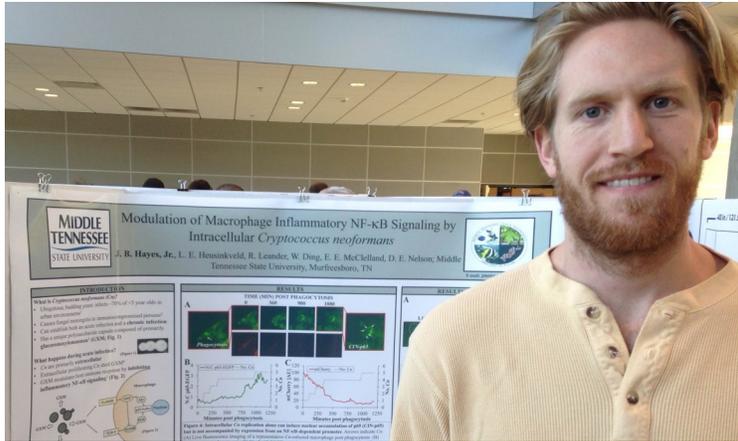


Chelsea R. Harmon, Stephen M. Wright (faculty), **Jeannie Stubblefield, Hyo Erin Park, and Norma Dunlap** presented “Isolation and Identification of Medicinal Components of *Cichorium intybus*.”

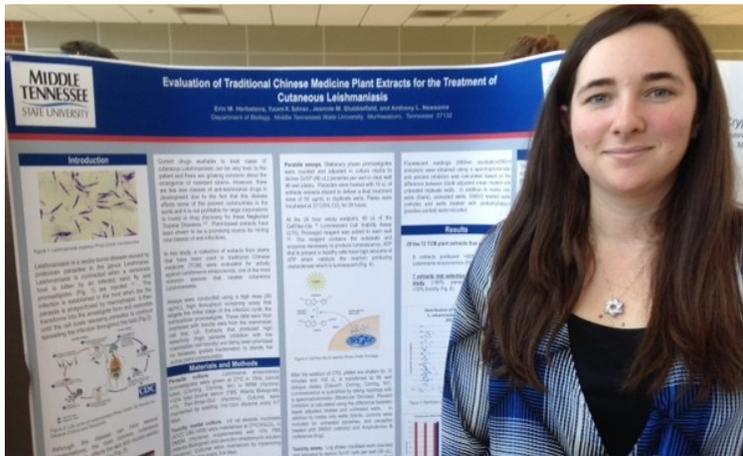


Posters in the Atrium (cont.)

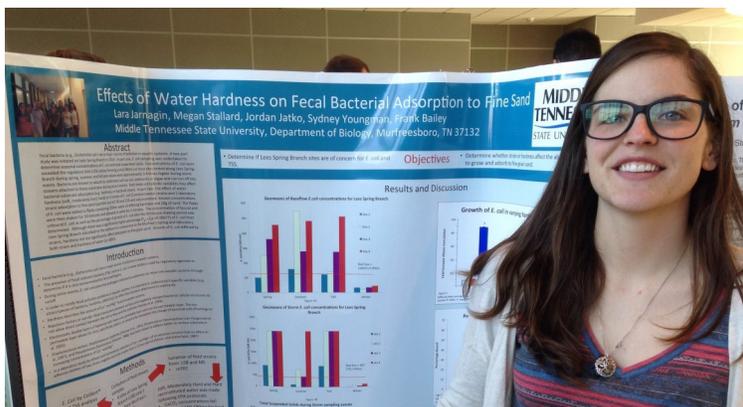
J.B. Hayes, L.E. Heusinkveld, R. Leander, W. Ding, E.E. McClelland (faculty), and D.E. Nelson (faculty) presented “Modulation of Macrophage Inflammatory NF- κ B Signaling by Intracellular *Cryptococcus neoformans*.”



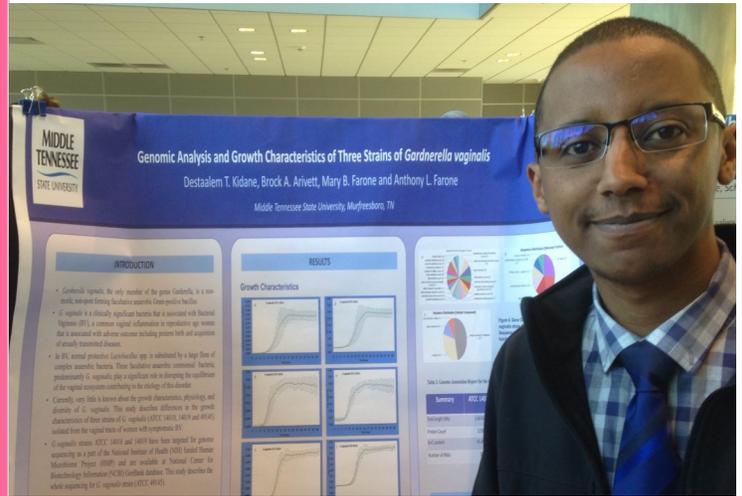
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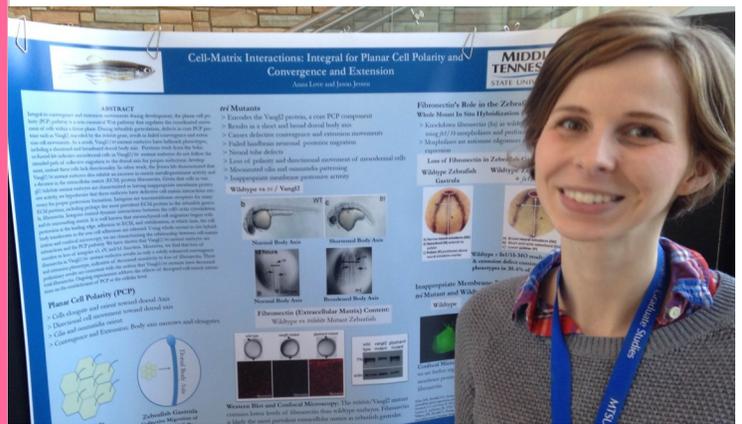
Lara Jarnagin, Megan Stallard, Jordan Jatko, Sydney Youngman, and Frank Bailey (faculty) presented “Effects of Water Hardness on Fecal Bacterial Adsorption to Fine Sand.”



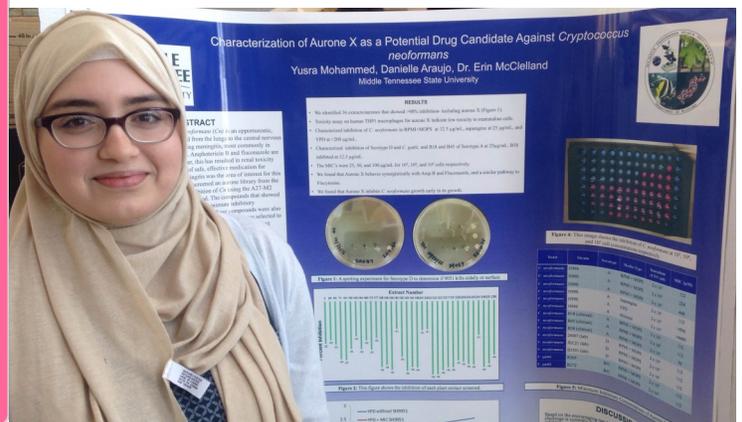
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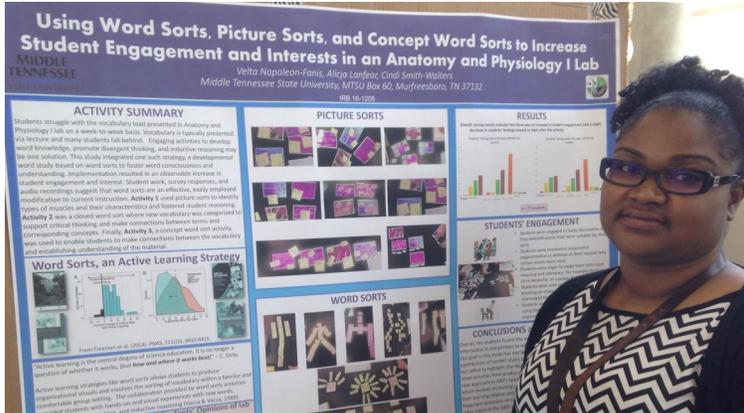


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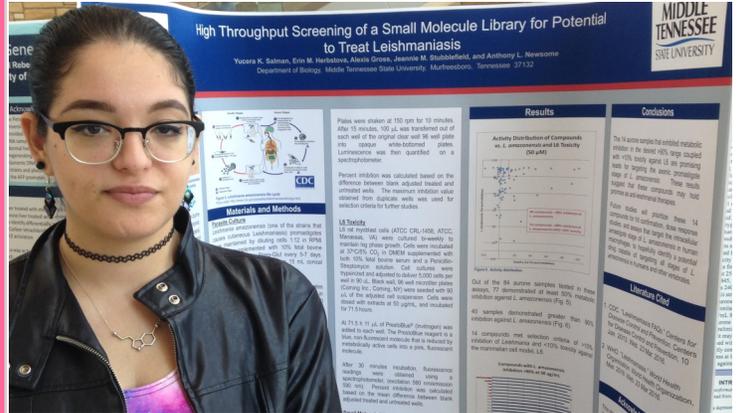


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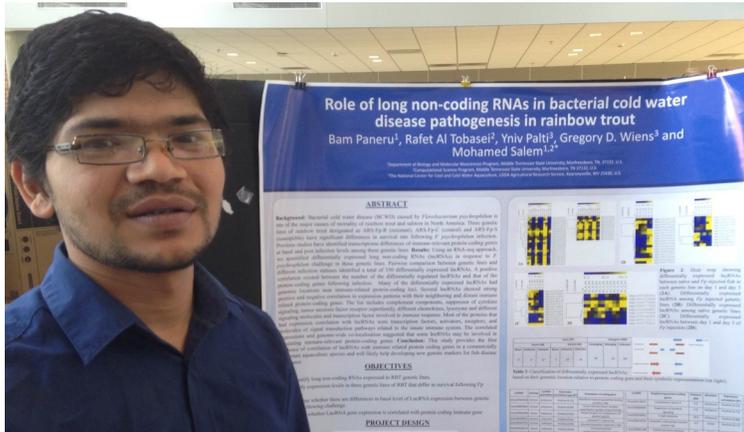
Velta Napoleon-Fanis, Alicja Lanfear (faculty), and **Cindi Smith-Walters** (faculty) presented “Using Word Sorts, Picture Sorts, and Concept Word Sorts to Increase Student Engagement and Interests in an Anatomy and Physiology I Lab.”



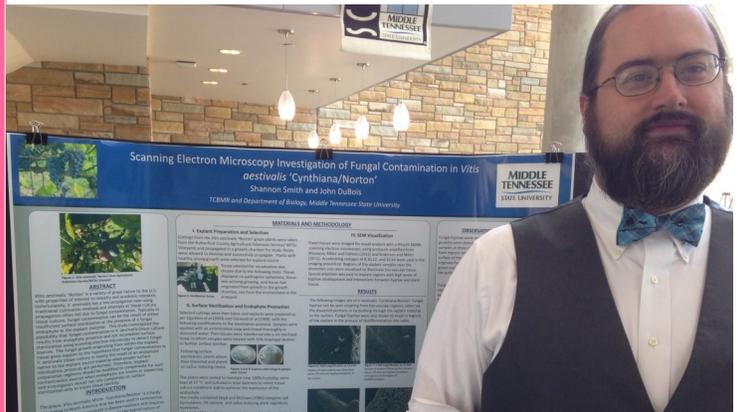
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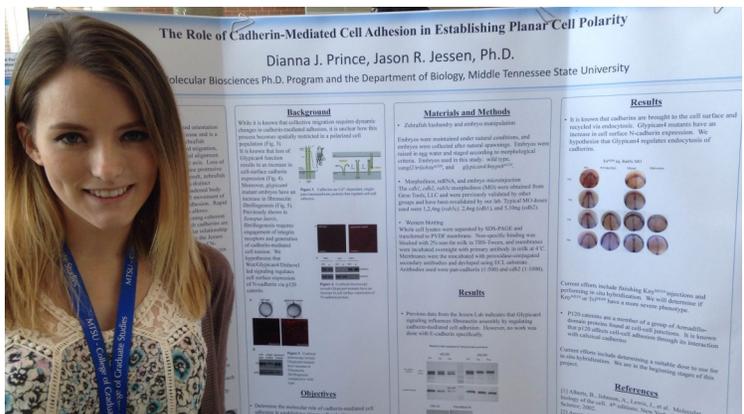
Bam Paneru, Rafet Al-Tobasei, Yniv Palti, Gregory D. Wiens, and Mohamed Salem (faculty) presented “Role of Long Non-coding RNAs in Bacterial Cold Water Disease Pathogenesis in Rainbow Trout.”



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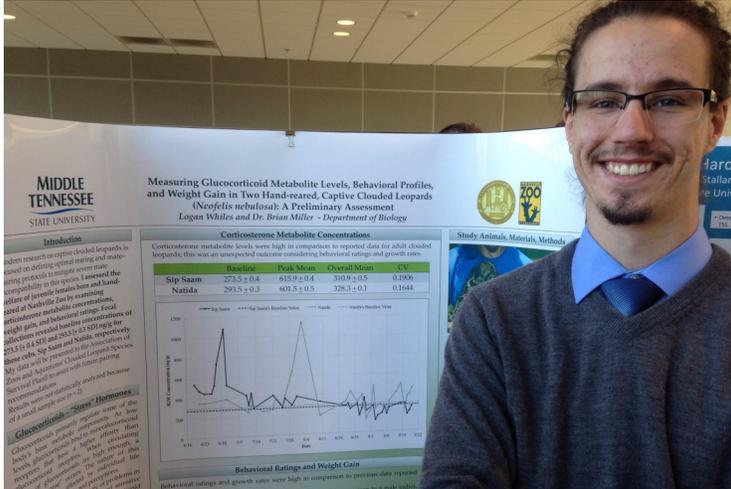


Megan Stallard, Sydney Youngman, Lara Jarnagin, Jordan Jatko, and Frank C. Bailey (faculty) presented “Assessment of General and Human-Associated Bacteroidales Fecal Bacterial Markers in Biofilms from Stormwater Outfalls.”



Posters in the Atrium (cont.)

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Aimee Wilson and John DuBois (faculty) presented “A Protocol for Endophyte-Free Callus Tissue of the Grape *Vitis aestivalis* ‘Norton/Cynthiana’.”



BioUpdate

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

Produced by MTSU
Department of Biology

0416-2842 / Middle Tennessee State University does not discriminate against students, employees, or applicants for admission or employment on the basis of race, color, religion, creed, national origin, sex, sexual orientation, gender identity/expression, disability, age, status as a protected veteran, genetic information, or against any other legally protected class with respect to all employment, programs, and activities. The following person has been designated to handle inquiries related to nondiscrimination policies for MTSU: Assistant to the President for Institutional Equity and Compliance. For additional information about these policies and the procedures for resolution, please contact Marian V. Wilson, assistant to the president and Title IX Coordinator, Institutional Equity and Compliance, Middle Tennessee State University, Cope Administration Building 116, 1301 East Main Street, Murfreesboro, TN 37132; Marian.Wilson@mtsu.edu; or call 615-898-2185. MTSU’s policy on nondiscrimination can be found at <http://www.mtsu.edu/titleix/>.

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Biology Department, MTSU Box 60, Murfreesboro, TN 37132

Fax: 615-898-5093

E-mail: John.Dubois@mtsu.edu



Scholars Week Highlights Faculty and Student Research

Middle Tennessee State University held its annual Scholars Week March 28-April 1, 2016. The department presented 33 posters. Authors of these posters included 15 faculty members, 29 graduate students, and 47 undergraduate students.

Awards were given to the top three posters presented by graduate students and undergraduate students from each college. Five posters from the Department of Biology took home awards. James Dean tied for second place in the undergraduate student section. Hannah Houle *et al.* tied for third place in the undergraduate student section. Connor Olson received first place in the graduate student section. Ali Ali *et al.* tied for second place in the graduate student section. Shannon Smith received third place in the graduate student section. Biology posters accounted for five of the 12 awards given to the College of Basic and Applied Sciences.

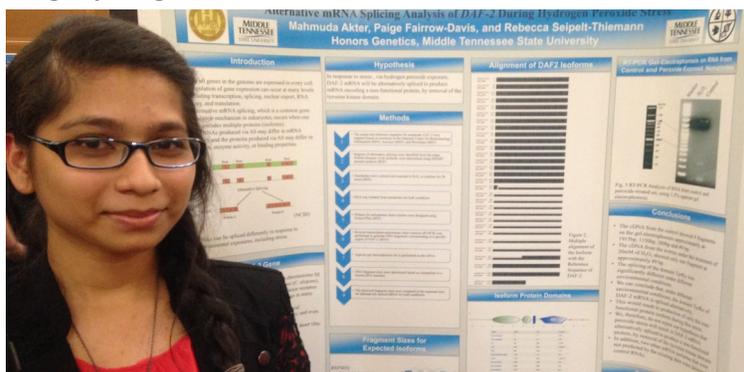
Faculty members involved in mentoring these students deserve credit for their time, effort and expertise in these research projects. Many people from across campus saw the quality of research being conducted in the department. Congratulations to all authors for a job well done!

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.

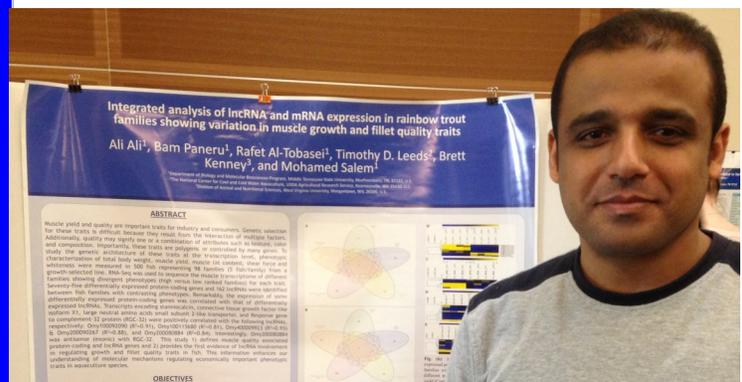
Christopher Adereti, Justice Adewumi, Doha Ahmed, Mary Botros, Channell Davis, Hannah Houle, Alexis Johnson, Wesley Kirkland, Brittanie Miles, Lacey Oids, Blair Pedora, Michael Soto, Arol Zague, Sade Dunn, Spencer McDaniel, Chirron Mayi, and Jeffrey Leblond (faculty) presented “Distinguishing Between Morphologically Similar Lichens by Sterol Composition.”



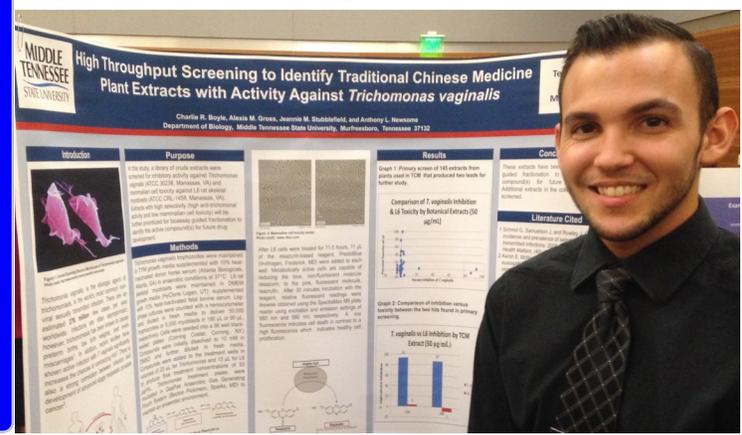
Mahmuda Akter, Paige Fairrow-Davis, and Rebecca Seipelt-Thiemann (faculty) presented “Alternative mRNA Splicing Analysis of *DAF-2* During Hydrogen Peroxide Stress.”



Ali Ali, Bam Paneru, Rafet Al-Tobasei, Timothy D. Leeds, Brett Kenney, and Mohamed Salem (faculty) presented “Integrated analysis of lncRNA and mRNA Expression in Rainbow Trout Families Showing Variation in Muscle Growth and Fillet Quality Traits.”

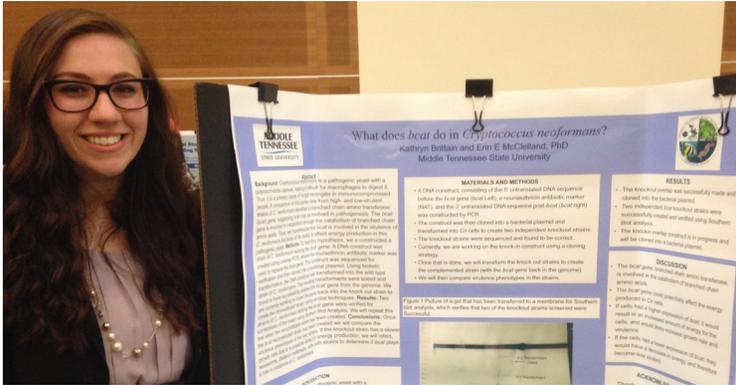


Charlie R. Boyle, Alexis M. Gross, Jeannie M. Stubblefield, and Anthony Newsome (faculty) presented “High Throughput Screening to Identify Traditional Chinese Medicine Plant Extracts with Activity Against *Trichomonas vaginalis*.”

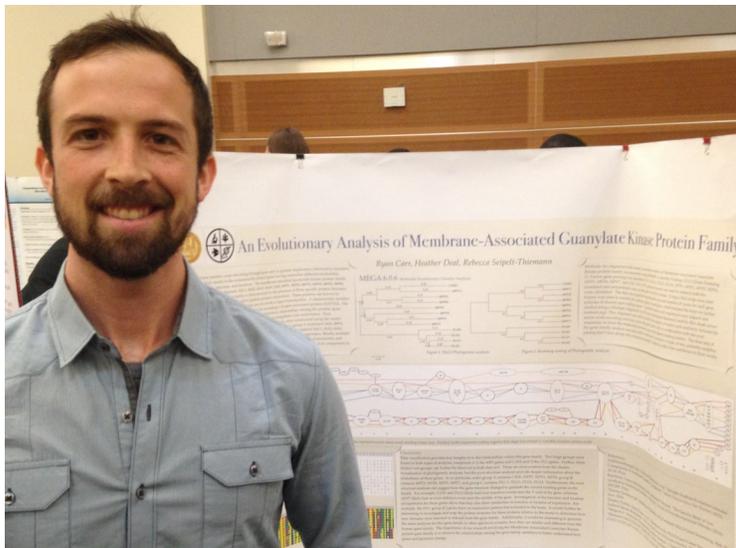


Scholars Week (cont.)

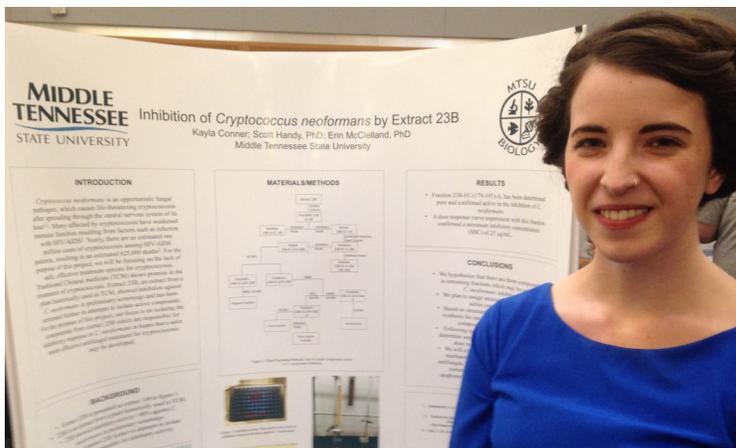
Kathryn Brittain and Erin McClelland (faculty) presented “What Does *BCAT* Do in *Cryptococcus neoformans*?”



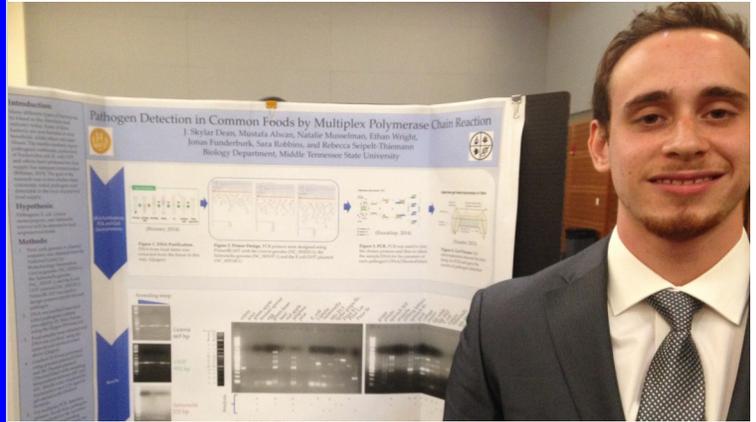
Ryan Carr, Heather Deal, and Rebecca Seipelt-Thiemann (faculty) presented “An Evolutionary Analysis of Membrane-Associated Guanylate-Kinase Protein Family.”



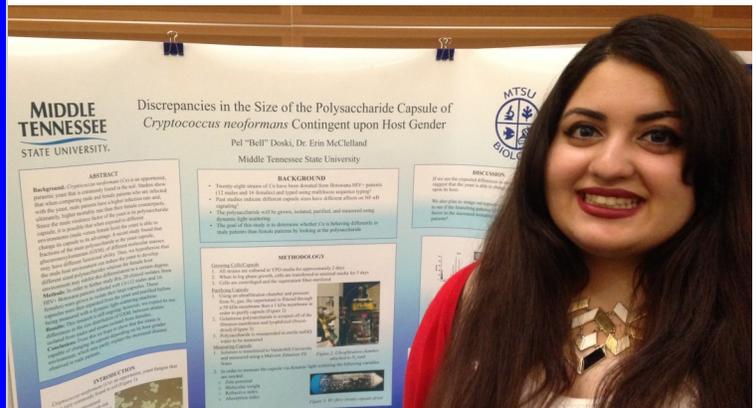
Kayla Conner, Scott Handy, and Erin McClelland (faculty) presented “Inhibition of *Cryptococcus neoformans* by Extract 23B.”



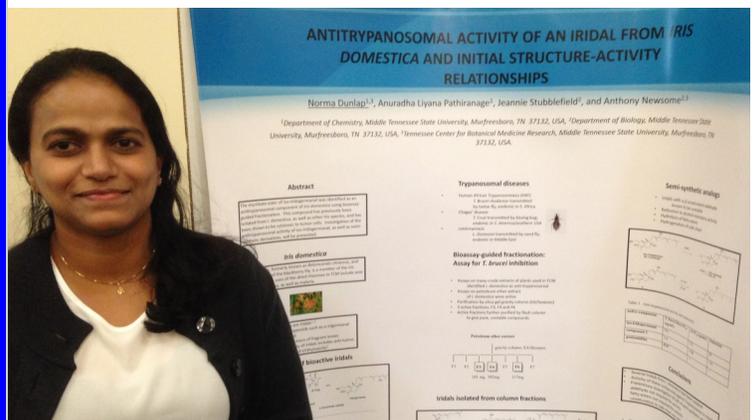
James Dean, Mustafa Alwan, Natalie Musselman, Ethan Wright, Jonas Funderburk, Sara Robbins, and Rebecca Seipelt Thiemann (faculty) presented “Pathogen Detection in Foods by Multiplex Polymerase Chain Reaction.”



Pel “Bell” Doski and Erin McClelland (faculty) presented “Discrepancies in the Size of the Polysaccharide-Capsule of *Cryptococcus neoformans* Contingent upon Host Gender.”

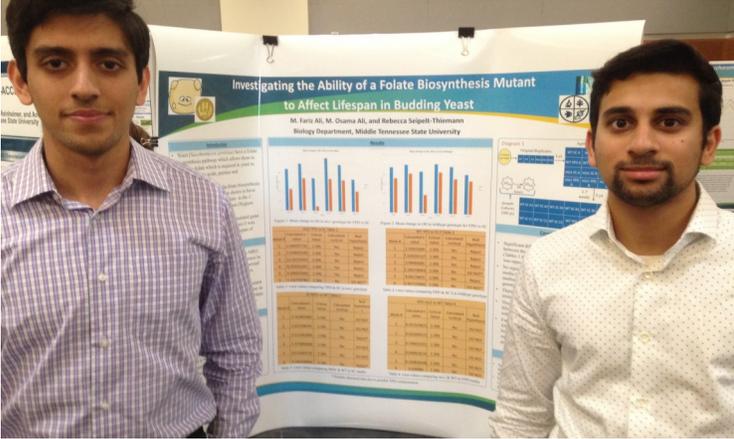


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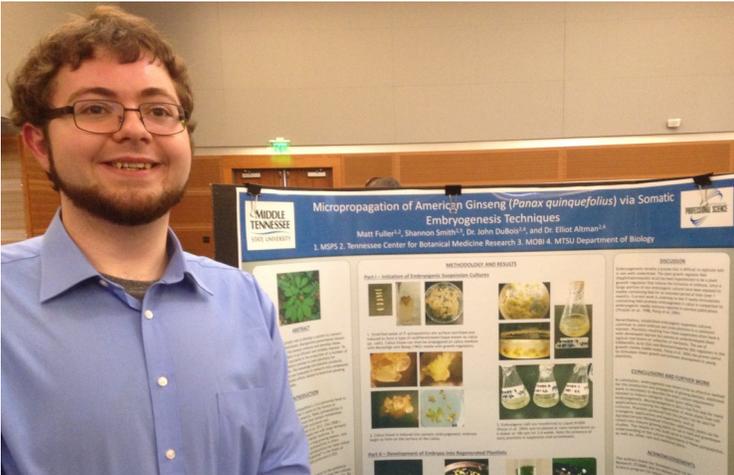


Scholars Week (cont.)

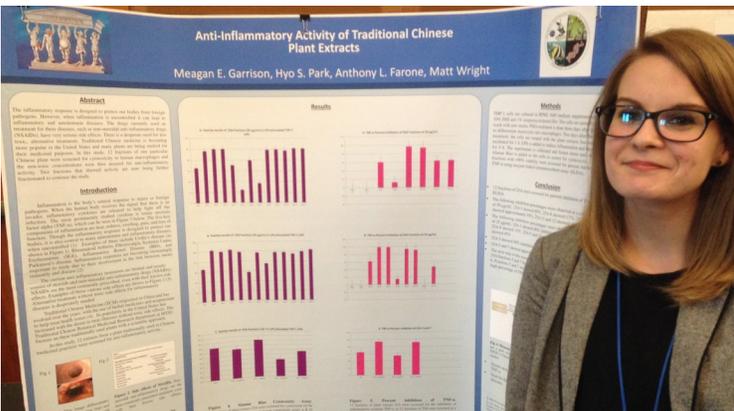
Mohammad Fariz, Muhammad Ali, and Rebecca Seipelt-Theimann (faculty) presented “Investigating the Ability of a Folate Biosynthesis Mutant to Affect Lifespan in Budding Yeast.”



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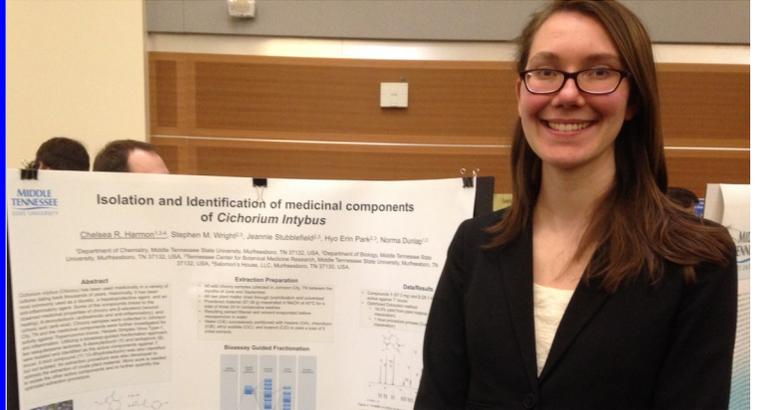
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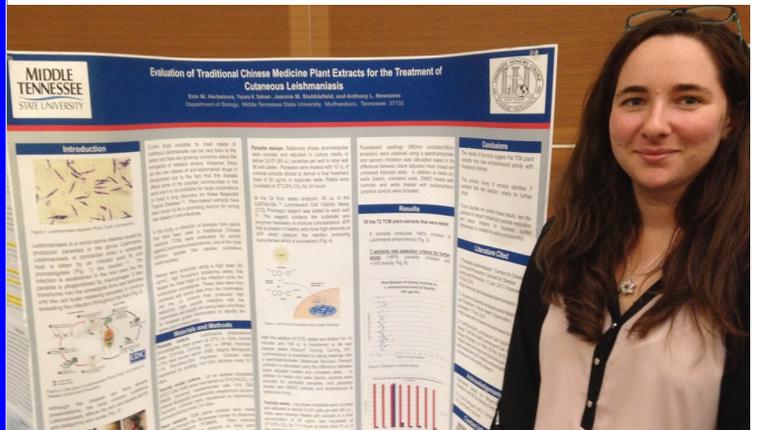
Zachary T. Grimes, Brett T. Spear, Martha L. Peterson, and Rebecca L. Seipelt-Thiemann (faculty) presented “Towards the Molecular Identification of *Afr2*, a Gene Implicated in Liver Cancer.”



Chelsea R. Harmon, Stephen M. Wright (faculty), **Jeanie Stubblefield, Hyo Erin Park, and Norma Dunlap** presented “Isolation and Identification of Medicinal Components of *Cichorium intybus*.”

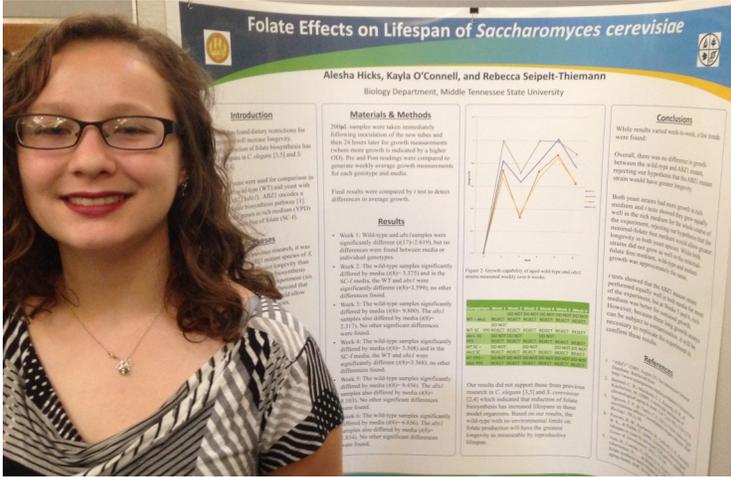


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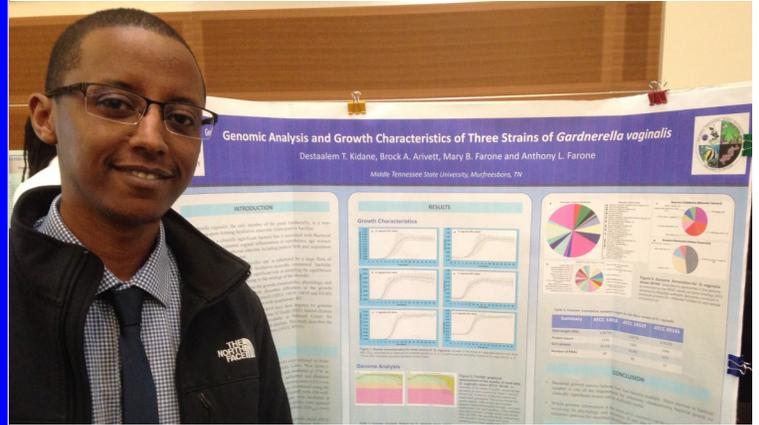


Scholars Week (cont.)

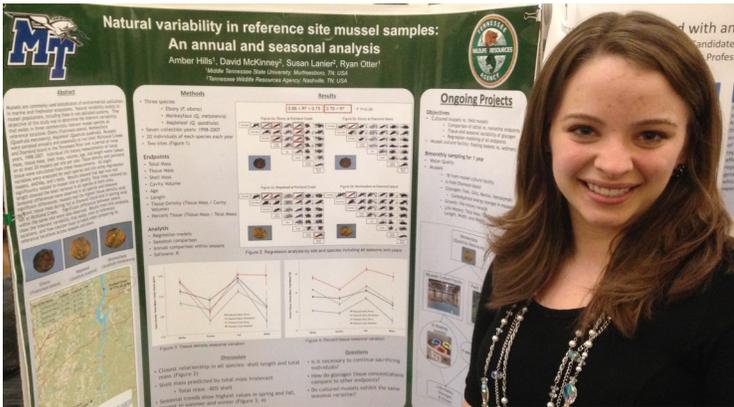
Alesha Hicks, Kayla O'Connell, and Rebecca Seipelt-Thiemann (faculty) presented "Folate Effects on Lifespan of *Saccharomyces cerevisiae*."



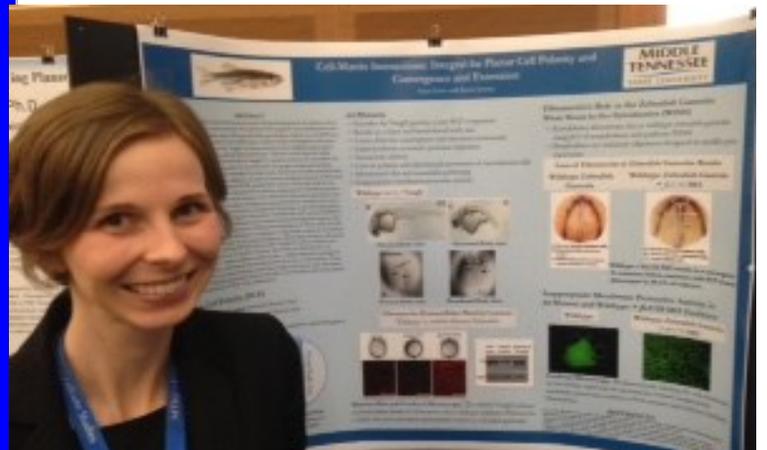
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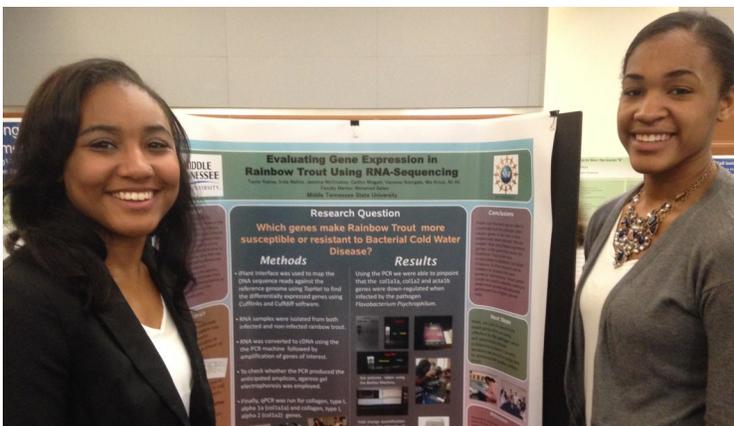
Amber Hills, David McKinney, Susan Lanier, and Ryan Otter (faculty) presented "Natural Variability in Reference Site Mussel Samples: An Annual and Seasonal Analysis."



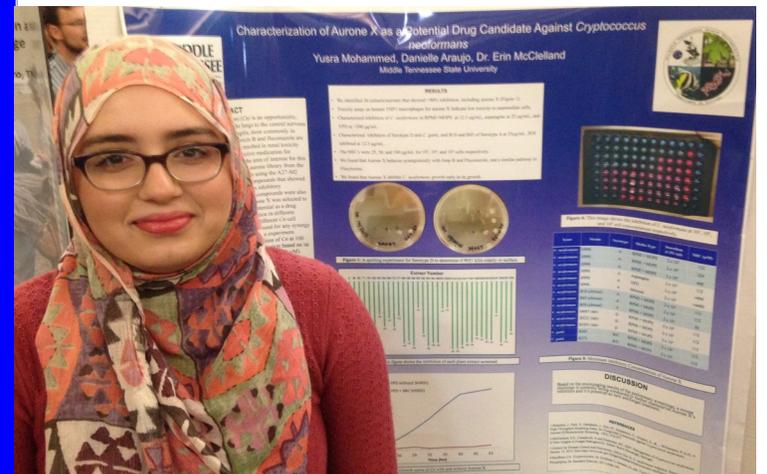
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Taylor Kelsey, India Mathis, Jasmine McCroskey, Caitlyn Midgett, Vanessa Ndongala, Mia Krout, Ali Ali, and Mohamed Salem (faculty) presented "Evaluating Gene Expression in Rainbow Trout Using RNA-Sequencing."

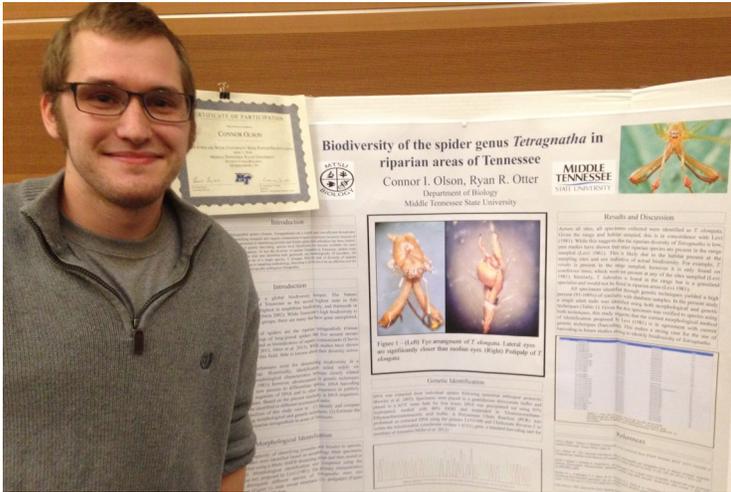


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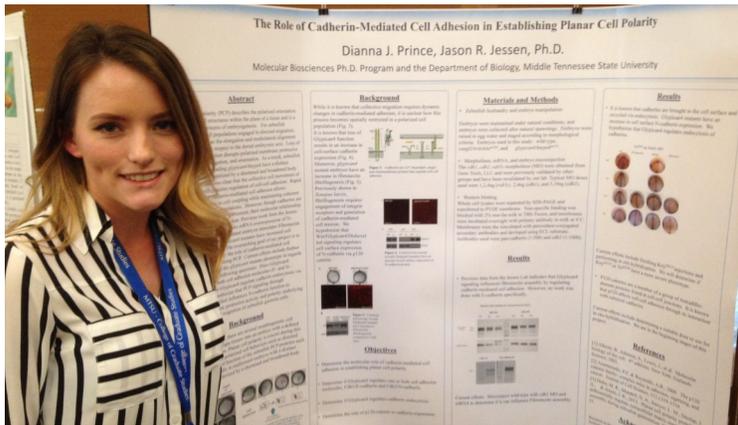


Scholars Week (cont.)

Connor Olson and Ryan Otter (faculty) presented “Biodiversity of the Spider Genus *Tetragnatha* in Riparian Areas of Tennessee.”



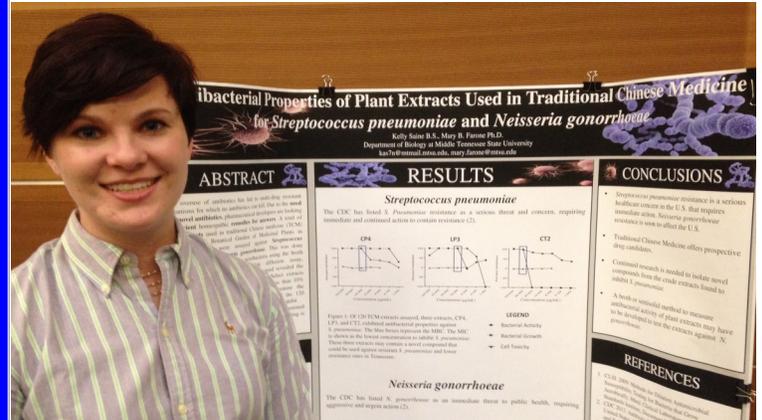
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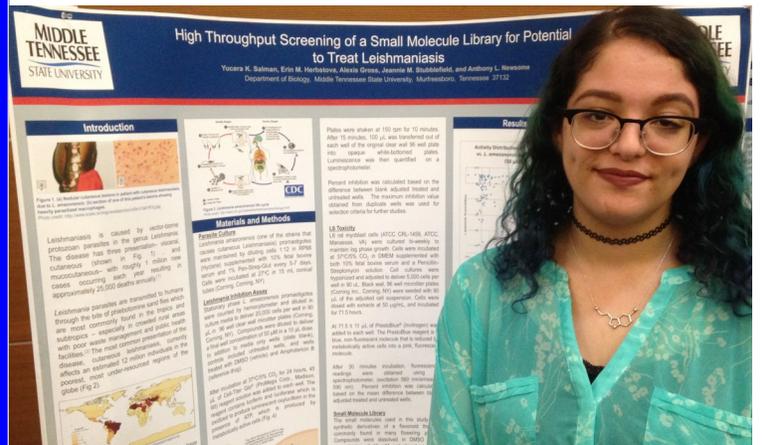
Lee Rumble, Melanie Heckman, and Drew Sieg (faculty) presented “A Survey of Wounding Frequency among Trees Found in Urban And Forest Environments.”



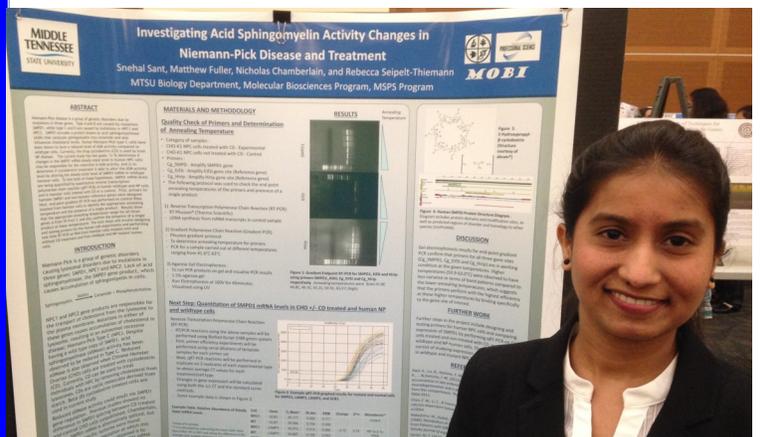
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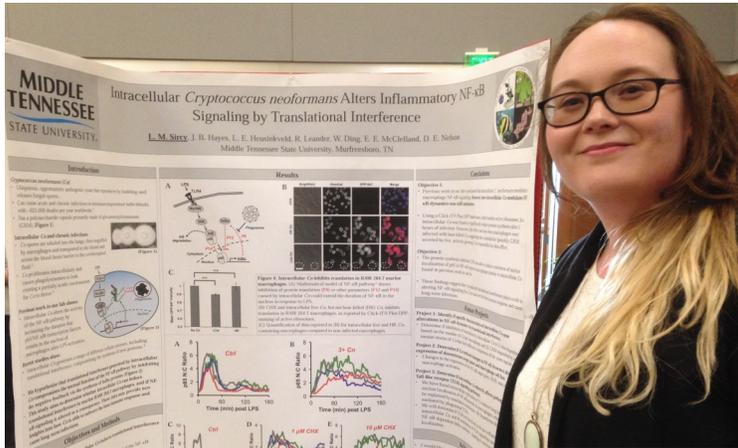


Snehal Sant, Matthew Fuller, Nicholas Chamberlain, and Rebecca Seipelt-Thiemann (faculty) presented “Investigating Acid Sphingomyelin Activity Changes in Neimann-Pick Disease and Treatment.”



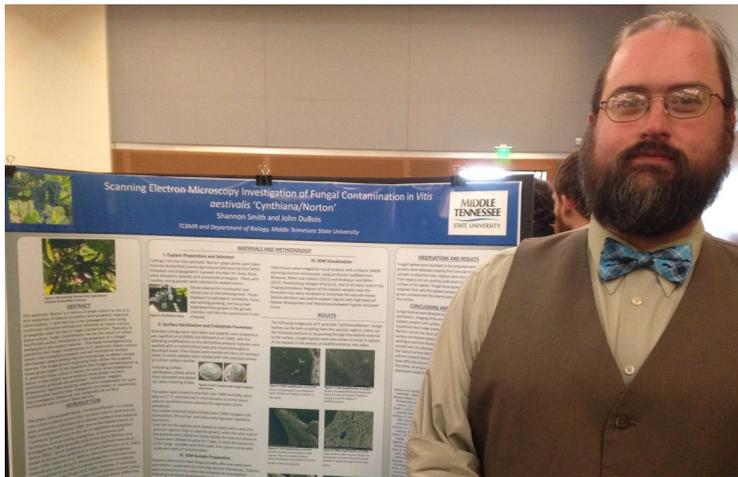
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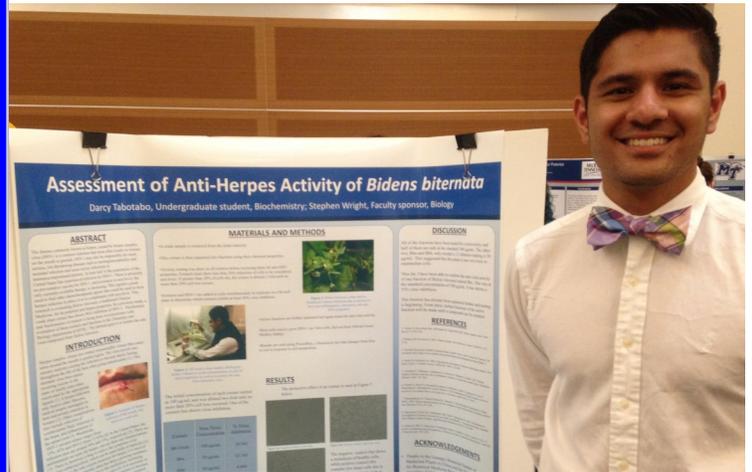


Emily Smith, Erin McClelland (faculty), and Ronnakkumar Patel presented “Creation of the RTA1 Reconstituted Strain in *Cryptococcus neoformans*.”

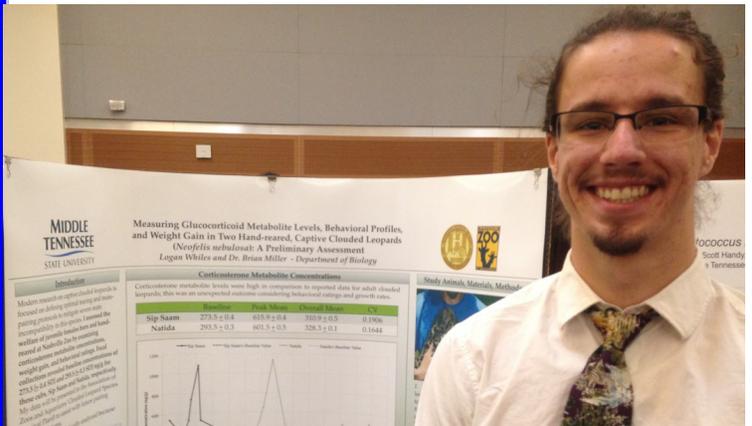
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Summer Scholars Day is
July 29, 2016

The next Scholars Week is
March 27-31, 2017